

VOLUME 27



Revista Brasileira de Geriatrics e Gerontologia

Brazilian Journal of Geriatrics and Gerontology



Revista Brasileira de Geriatria e Gerontologia

Brazilian Journal of Geriatrics and Gerontology

VOLUME 27, 2024

Editor / Editor

Renato Peixoto Veras

Editor Associado / Associate Editor

Kenio Costa de Lima

Editor Executivo / Executive Editor

Raquel Vieira Domingues Cordeiro

Grupo de Assesores / Editorial Advisory Board

Alexandre Kalache – Centro Internacional de Longevidade Brasil / International Longevity Centre Brazil (ILC BR). Rio de Janeiro-RJ - Brasil

Anabela Mota Pinto – Universidade de Coimbra. Coimbra - Portugal

Anita Liberalesso Néri – Universidade Estadual de Campinas. Campinas-SP – Brasil

Annette G. A. Leibing – Universidade Federal do Rio de Janeiro. Rio de Janeiro-RJ – Brasil

Antón Alvarez – EuroEspes Biomedical Research Centre. Corunã – Espanha

Candela Bonill de las Nieves – Hospital Universitario Carlos Haya. Málaga - Espanha

Carina Berterö – Linköping University. Linköping – Suécia

Catalina Rodriguez Ponce – Universidad de Málaga. Málaga – Espanha

Eliane de Abreu Soares – Universidade do Estado do Rio de Janeiro. Rio de Janeiro-RJ – Brasil

Emílio H. Moriguchi – Universidade Federal do Rio Grande do Sul. Porto Alegre-RS – Brasil

Emílio Jeckel Neto – Pontifícia Universidade Católica do Rio Grande do Sul. Porto Alegre-RS – Brasil

Evandro S. F. Coutinho – Fundação Oswaldo Cruz. Rio de Janeiro-RJ – Brasil

Guita Grin Debert – Universidade Estadual de Campinas. Campinas-SP – Brasil

Ivana Beatrice Mânica da Cruz – Universidade Federal de Santa Maria. Santa Maria-RS – Brasil

Jose F. Parodi – Universidad de San Martín de Porres de Peru. Lima – Peru

Lúcia Helena de Freitas Pinho França – Universidade Salgado de Oliveira. Niterói-RJ - Brasil

Lúcia Hisako Takase Gonçalves – Universidade Federal de Santa Catarina. Florianópolis-SC – Brasil

Luiz Roberto Ramos – Universidade Federal de São Paulo. São Paulo-SP – Brasil

Maria da Graça de Melo e Silva – Escola Superior de Enfermagem de Lisboa. Lisboa – Portugal

Martha Pelaez – Florida International University. Miami-FL – EUA

Mônica de Assis – Instituto Nacional de Câncer. Rio de Janeiro-RJ – Brasil

Raquel Abrantes Pêgo – Centro Interamericano de Estudios de Seguridad Social. México, D.F.

Ricardo Oliveira Guerra – Universidade Federal do Rio Grande do Norte. Natal-RN – Brasil

Normalização / Normalization

Maria Luisa Lamy Mesiano Savastano

Gisele de Fátima Nunes da Silva

Revista Brasileira de Geriatria e Gerontologia é continuação do título *Textos sobre Envelhecimento*, fundado em 1998. Tem por objetivo publicar e disseminar a produção científica no âmbito da Geriatria e Gerontologia, e contribuir para o aprofundamento das questões atinentes ao envelhecimento humano. Categorias de publicação: Artigos originais, Revisões, Relatos, Atualizações e Comunicações breves. Outras categorias podem ser avaliadas, se consideradas relevantes.

The Brazilian Journal of Geriatrics and Gerontology (BJGG) succeeds the publication Texts on Ageing, created in 1998. It aims to publish and spread the scientific production in Geriatrics and Gerontology and to contribute to the deepening of issues related to the human aging. Manuscripts categories: Original articles, Reviews, Case reports, Updates and Short reports. Other categories can be evaluated if considered relevant.

Colaborações / Contributions

Os manuscritos devem ser encaminhados ao Editor Executivo e seguir as “Instruções aos Autores” publicadas no site www.rbgg.com.br

All manuscripts should be sent to the Editor and should comply with the “Instructions for Authors”, published in www.rbgg.com.br

Correspondência / Correspondence

Toda correspondência deve ser encaminhada à Revista Brasileira de Geriatria e Gerontologia por meio do e-mail revistabgg@gmail.com

All correspondence should be sent to Revista Brasileira de Geriatria e Gerontologia using the email revistabgg@gmail.com

Revista Brasileira de Geriatria e Gerontologia

UERJ/UnATI/CRDE

Rua São Francisco Xavier, 524 – 10º andar - bloco F - Maracanã

20 559-900 – Rio de Janeiro – RJ, Brasil

Telefones: (21) 2334-0168 / 2334-0131 r. 229

E-mail: revistabgg@gmail.com - crderbgg@uerj.br

Web: www.scielo.br/rbgg

Site: www.rbgg.com.br

Indexação / Indexes

SciELO – Scientific Electronic Library Online

LILACS – Literatura Latino-Americana e do Caribe em Ciências da Saúde

LATINDEX – Sistema Regional de Información en Línea para Revistas Científicas de América Latina, el Caribe, España y Portugal

DOAJ – Directory of Open Access Journals

REDALYC - Red de Revistas Científicas de América Latina y el Caribe, España y Portugal

Free Medical Journals

Cabell's Directory of Publishing Opportunities

The Open Access Digital Library

UBC Library Journals

ORIGINAL ARTICLES

ANALYSIS OF KNOWLEDGE, ATTITUDES, AND PRACTICES OF PHYSICIANS AND NURSES REGARDING THE EXPERIENCES OF FAMILY CAREGIVERS OF OLDER ADULTS WITH DEMENTIA: A KAP STUDY

Monique Maira Maciel, Annelita Almeida Oliveira Reiners, Carla Rafaela Teixeira Cunha, Rosemeiry Capriata de Souza Azevedo, Joana Darv Chaves Cardoso, Amanda Cristina de Souza Andrade

ACCEPTABILITY OF A HOME-BASED MULTICOMPONENT EXERCISE PROGRAM (VIVIFRAIL®) FOR THE OLDEST-OLD VIA VIDEOCONFERENCING DURING THE COVID-19 PANDEMIC

Ana Paula Tiecker, Eduardo Lusa Cadore, Mikel Izquierdo, Gabriela Guimarães Oliveira Zmuda, Francielle Bonett Aguirre, Angelo José Gonçalves Bós

PREVENTIVE BEHAVIOR AGAINST COVID-19 AND ITS RELATIONSHIP WITH THE SOCIAL AND HEALTH CONDITIONS OF OLDER ADULTS

Isabella Risi Dias, Vitória Rocha Janbaque, Vanessa Aparecida Vilas-Boas, Suzimar de Fatima Benato Fusco, Daniella Pires Nunes

HEALTH SERVICES UTILIZATION BY OLDER ADULTS IN RURAL AND URBAN AREAS OF BRAZIL

Gleica Soyam Barbosa Alves, Rosana Cristina Pereira Parente, Fernando José Herkerath

SELF-ESTEEM AND AESTHETICS IN THE PERCEPTION OF OLDER ADULTS FROM SOCIAL ASSISTANCE REFERENCE CENTERS

Olivia Figueira, Carla Corradi Perini, Anor Sganzerla, Paulo Sergio Marcellini

POSTURAL BALANCE AND ASSOCIATED FACTORS WITH THE FALL RISK ASSESSED IN OLDER ADULTS WITH TYPE 2 DIABETES MELLITUS

Adriana Guedes Carlos, Vanessa da Nóbrega Dias, Monica Rodrigues Perracini, Flávia Doná, André Gustavo Pires Sousa, Juliana Maria Gazzola

SOCIAL ISOLATION AMID THE COVID-19 PANDEMIC AND MENTAL HEALTH: PERSPECTIVES OF INSTITUTIONALIZED OLDER ADULTS

Iasmin Narciso, Flávia de Oliveira, Silmara Nunes Andrade, Kellen Rosa Coelho

DEVELOPMENT AND CONTENT VALIDATION FOR A SELF-ASSESSMENT INSTRUMENT OF CARE QUALITY IN LONG-TERM CARE FACILITIES FOR OLDER ADULTS

Bruno Luís de Carvalho Vieira, Arianne Correa Martins, Raquel Conceição Ferreira, Andréa Maria Duarte Vargas

THE CARE OF OLDER ADULTS IN THE PROCESS OF FRAILTY: CHALLENGES AND EMOTIONS FROM THE CAREGIVER'S PERSPECTIVE

Gislaine Alves de Souza, Karla Cristina Giacomini, Josélia Oliveira Araújo Firmo

INTERGENERATIONALITY AND HEALTH PROMOTION: REFLECTIONS AND CHALLENGES IN THE CARE OF OLDER ADULTS

Ana Paula Ribeiro de Castro, Antonio Germane Alves Pinto, José Maria Ximenes Guimarães, Geanne Maria Costa Torres, Ana Patrícia Pereira Morais

IMMERSIVE RPG ELDERLY HEALTH: A NEW POSSIBILITY FOR CONSTRUCTING HEALTH LEARNING?

Aline Rodrigues Reser, Paula Suseli Silva de Bearzi, Julio Cesar de Matos, Renato José De Marchi, Aline Blaya Martins

ANALYSIS OF THE TREND OF MORTALITY FROM EXTERNAL CAUSES IN OLDER ADULTS IN BRAZIL, 2000 TO 2022

Danilo Erivelton Medeiros Dias, Alycia Ágata da Silva Costa, Kaio Dênnys de Lucena Martins, Arthur Alexandrino, Mathews Figueiredo Nogueira, Cristiane da Silva Ramos Marinbo

POLYPHARMACY, POTENTIALLY INAPPROPRIATE MEDICATIONS, AND THE VULNERABILITY OF OLDER ADULTS

Raquel Coelho de Andrade, Maira Mendes dos Santos, Euler Esteves Ribeiro, James Dean Oliveira dos Santos Júnior, Hércules Lázaro Morais Campos, Elisa Brosina de Leon

CONTEMPORARY CARE MODEL FOR THE AGED: AN IMMINENT NEED

Renato Peixoto Veras

LOW PROTEIN INTAKE IS ASSOCIATED WITH MORTALITY IN BRAZILIAN OLDER ADULTS

Ângela Maria Natal de Souza, Dalila Pinto de Souza Fernandes, Isab Rabiú, Jérsica Martins Bittencourt, Juliana Farias de Novaes, Andréia Queiroz Ribeiro

DESIRE AND WILL OF INSTITUTIONALIZED OLDER ADULTS REGARDING END-OF-LIFE TERMINALITY

Fabiane Marzari Possatti, Silvana Bastos Cogo, Nara Marilene Oliveira Girardon Perline, Larissa Venturini, Marinês Tambara Leite, Cenir Gonçalves Tier

COMPARATIVE ANALYSIS OF OLDER ADULTS AND HOSPITALIZED ADULTS' PERCEPTION OF HOSPITAL DIET QUALITY

Letícia Aeko Barone Ozama, Eduardo Federighi Baisi Chagas, Joyce Fernanda Soares Albino Ghezzi, Maria Angélica Spadella

REVIEW ARTICLE

SCIENTIFIC PUBLICATIONS ON DRIVING BY OLDER ADULTS: SCOPE REVIEW

Danielle Félix Arruda Mourão, Eveline Alves Oliveira, Alice Silva Osterne Ribeiro, Paulo César de Almeida, Thalís Rebouças de Oliveira, Maria Célia de Freitas

BALANCE, FALLS, AND RISK OF FALLS IN COPD: SYSTEMATIC REVIEW OF ASSESSMENT INSTRUMENTS, MEASUREMENT PROPERTIES, AND CLINICAL UTILITY







Ana Cristina Lamezón, Bruna Luna Cavon, Silvia Valderramas

EDUCATION PRACTICES FOR OLDER WOMEN GUIDED BY THE CONSTRUCTS OF PAULO FREIRE: SCOPE REVIEW

Monique de Freitas Gonçalves Lima, Francisca Márcia Pereira Linhares, Eliane Maria Ribeiro de Vasconcelos, Gilson Nogueira Freitas, Anna Karla de Oliveira Tito Borba, Laís Helena de Souza Soares Lima



Analysis of knowledge, attitudes, and practices of physicians and nurses regarding the experiences of family caregivers of older adults with dementia: a KAP study

Monique Maira Maciel¹ 
Annelita Almeida Oliveira Reiners¹ 
Carla Rafaela Teixeira Cunha¹ 
Rosemeiry Capriata de Souza Azevedo¹ 
Joana Darc Chaves Cardoso¹ 
Amanda Cristina de Souza Andrade² 

Abstract

Objective: To analyze the Knowledge, Attitudes, and Practices (KAP) of healthcare professionals during the care of older individuals living with dementia, concerning the caregiving situations experienced by informal caregivers, and its association with sociodemographic and professional factors. **Method:** A cross-sectional analytical KAP study was conducted in the municipality of Tangará da Serra, Mato Grosso, with 20 nurses and 20 physicians from Family Health Units. Data were collected through interviews using an instrument developed based on the available literature on KAP studies. Descriptive analysis and bivariate analysis of the association between the knowledge, attitudes, and practices of healthcare professionals and sociodemographic and professional variables were performed using the Fisher's exact test, with a significance level of 5%. **Results:** Healthcare professionals demonstrated satisfactory knowledge and favorable attitudes towards caregiving situations experienced by informal caregivers of older individuals living with dementia. However, 65% of professionals exhibited insufficient practices directed at caregivers, including guidance, support groups, and health education. No significant association was found between knowledge, attitudes, practices, and sociodemographic or professional variables. **Conclusion:** Despite healthcare professionals possessing satisfactory knowledge of caregiving situations and positive attitudes towards informal caregivers, their practices are inadequate in meeting their needs. This deficiency does not contribute to enabling caregivers to cope with the various challenges that arise during the course of the disease for both the older individual and the caregivers themselves.

Keywords: Knowledge. Attitudes and Practice in Health. Healthcare Personnel. Caregivers. Older Adults. Dementia.

¹ Universidade Federal do Mato Grosso (UFMT), Faculdade de Enfermagem, Programa de Pós- Graduação em Enfermagem. Cuiabá, MT, Brasil.

² Universidade Federal do Mato Grosso (UFMT), Instituto de Saúde Coletiva. Cuiabá, MT, Brasil.

There was no funding for the execution of this work.

The authors declare that there is no conflict in the conception of this work..

Correspondence
Monique Maira Maciel
monique_maira@hotmail.com

Received: May 18, 2023
Approved: October 25, 2023

INTRODUCTION

Dementia affects 55 million people worldwide¹. Projections indicate that by 2030, this number will rise to 78 million, and by 2050, it will reach 139 million individuals living with some form of dementia¹. However, it is estimated that approximately 75% of individuals with dementia globally remain undiagnosed². In Brazil, it is believed that there are two million people living with some form of dementia; nevertheless, underdiagnosis remains a significant issue³.

As dementias, being progressive and irreversible conditions, impact the ability of older individuals to carry out Activities of Daily Living (ADLs). Over time, elderly individuals become increasingly dependent, necessitating care⁴. Typically, family members, particularly wives, daughters, and daughters-in-law, assume this role, and they are referred to as informal caregivers (ICs)^{5,6}.

Over time, the continuous caregiving demands, coupled with increased domestic responsibilities, family reconfiguration, changes in the health status of the older individual living with dementia (OILD), and shifts in the personal and work life of the caregiver, often lead to various consequences. These consequences encompass physical, mental, social, and emotional repercussions, including physical exhaustion, burden, depression, anxiety, and social isolation, which can even affect the caregiver's self-care⁷.

Researchers, organizations, and institutions have recommended that healthcare professionals involved in dementia care not only provide care for the older individual with living with dementia but also extend their attention to the caregivers. This approach aims to offer assistance and support for the various caregiving-related issues^{1,8}. In this regard, there is a growing body of research focusing on OILDs and their caregivers⁹⁻¹¹.

Nevertheless, regarding the relationship between healthcare professionals and caregivers of OILDs, the evidence remains limited. Studies conducted with healthcare professionals indicate that they acknowledge the burden experienced by caregivers and their need for care. However, assistance may not

always be readily available to them^{6,12}. Consequently, there is a recognized need to allocate more time for the care of OILDs and their ICs.

Following searches in various databases, it was observed that there is a paucity of studies in the literature that have aimed to investigate the knowledge, attitudes, and practices of healthcare professionals regarding the caregiving situations experienced by ICs. In this context, the objective of this investigation was to analyze the knowledge, attitudes, and practices of healthcare professionals while providing care to OILDs concerning the caregiving situations experienced by ICs and to assess their association with sociodemographic and professional factors.

METHODS

This is a cross-sectional analytical study of the Knowledge, Attitudes, and Practices (KAP) type. Such studies are commonly employed in health sciences, especially in public health, aiming to provide insights into knowledge, beliefs, perceptions, and health-related behaviors¹⁴. The fundamental stages of this type of study encompass identifying the research topic, selecting the target population, formulating KAP questions, providing response options, devising a scoring system for the instrument, and instrument validation¹⁴.

The study was conducted in the municipality of Tangará da Serra, located in the state of Mato Grosso (MT), Brazil, situated approximately 232 km from the capital, Cuiabá. As of 2021, the estimated population of Tangará da Serra was 107,631 inhabitants¹⁵. This location was chosen due to its status as a state hub for healthcare professional training. Currently, the municipality has 22 Family Health Units (Unidades de Saúde da Família, USF), each staffed with at least a physician, nurse, nursing technician and/or assistant, and community health agent (Agente Comunitário de Saúde, ACS).

During the research period, there were 53 healthcare professionals with higher education working in the units, and the research population consisted of all of them. In the study, 43 professionals were included, comprising 21 nurses and 22 physicians

who reported providing healthcare to OILDs in the USF. The final sample, after accounting for dropouts, consisted of 40 participants.

Data collection took place in the months of February and March 2022. Once the professional agreed to participate, a day and time were scheduled according to their availability for conducting the interview at the Family Health Unit, while adhering to the biosafety guidelines to prevent covid-19. After reading and signing the Informed Consent Form (ICF), a copy was provided to the research participant.

The interview was conducted using an instrument consisting of questions related to the healthcare

professional's sociodemographic and professional information, as well as questions formulated based on the available literature regarding the knowledge, attitudes, and practices of professionals in relation to caregiving situations experienced by ICs of OILDs^{5,16,17} (Chart 1). For the Knowledge questions, professionals had three response options (correct; incorrect; I don't know), and for the Attitudes questions, they had three options (agree; disagree; undecided). As for the Practices questions, they had three response options (yes; no; sometimes) for six practice options presented. Furthermore, professionals were asked to provide reasons for not implementing the practices or for only occasionally doing so (Chart 1).

Chart 1. Questions regarding the knowledge, attitudes, and practices of professionals in relation to caregiving situations experienced by informal caregivers of OILDs included in the data collection instrument.

1. KNOWLEDGE ABOUT INFORMAL CAREGIVERS OF OLDER ADULTS WITH DEMENTIA
Regarding informal caregivers of older adults with dementia, respond to the following statements:
<ol style="list-style-type: none"> 1. Typically, caregivers have sufficient knowledge about what dementia is. 2. Caregivers can experience loneliness and a sense of familial abandonment. 3. Due to caregiving, caregivers may suffer physical consequences such as body pain and insomnia. 4. Commonly, caregivers have insufficient knowledge about dementia treatments. 5. Because of caregiving, caregivers may experience mental and/or emotional consequences such as anxiety, stress, and depression. 6. In general, caregivers are adequately trained to care for individuals with dementia. 7. As a result of caregiving, caregivers may face social consequences such as job loss, decreased income, and social isolation. 8. Generally, caregivers do not have difficulties in self-care. 9. It is common for caregivers to have difficulties in caring for the older individual with dementia (e.g., not knowing how to handle the behavioral changes of the older individual).
2. ATTITUDES TOWARDS INFORMAL CAREGIVERS OF OLDER ADULTS WITH DEMENTIA
Regarding informal caregivers of older adults with dementia:
<ol style="list-style-type: none"> 1. I believe that, in general, they have sufficient knowledge about what dementia is. 2. I think caregivers have insufficient knowledge about dementia treatments. 3. I consider that, due to caregiving, caregivers may suffer physical consequences such as body pain and insomnia. 4. I assume that, because of caregiving, caregivers may experience mental and/or emotional consequences such as anxiety, stress, and depression. 5. I believe that, as a consequence of caregiving, caregivers may face social consequences such as job loss, decreased income, and social isolation. 6. I believe that, in general, caregivers are not adequately trained to care for individuals with dementia. 7. I consider that caregivers often have difficulties in self-care. 8. I suppose that the healthcare professional attending to the older individual with dementia should provide caregivers with information about the disease, care, and support services. 9. I believe it is important to support and guide caregivers regarding dementia and care for the older individual.

to be continued

Continuation of Chart 1

10. I think that, in the care of older individuals with dementia, it is necessary for the healthcare professional to allocate time to listen to the caregiver's needs.
11. I believe that healthcare professionals should also be concerned about the caregiver during the care of the older individual with dementia.
12. I believe that healthcare professionals should expect caregivers to reach out because they are responsible for seeking help.
13. I believe it is common for caregivers to have difficulties in caring for the older individual with dementia (e.g., not knowing how to handle the behavioral changes of the older individual).
3. HEALTHCARE PROFESSIONAL PRACTICES REGARDING THE ATTENTION TO CAREGIVERS OF OLDER ADULTS WITH DEMENTIA
In my practice of caring for older individuals with dementia, I carry out certain actions with caregivers:
1. Home visits;
2. Team training;
3. Support groups;
4. Health education;
5. Caregiver consultations;
6. Providing information and/or guidance.
Reasons for not implementing these practices or doing them only occasionally:
1. Time constraints;
2. Communication difficulties;
3. Difficulty in managing family issues associated with dementia;
4. Struggles to meet family expectations;
5. Lack of training in providing care to OILDs and their caregivers;
6. Insufficient knowledge about support services for OILDs and their caregivers.

Source: Authors, 2022.

To accurately assess the studied phenomenon, the instrument was subjected to a committee of 17 judges selected based on predetermined criteria to validate its reliability and suitability, as recommended in the literature¹⁸. The Content Validity Index (CVI) of the instrument was 0.96.

To assess the applicability of the instrument and identify any unforeseen operational issues, a pilot test was conducted in a neighboring municipality with six healthcare professionals who met the inclusion criteria of the research. The questionnaire proved to be suitable for achieving the study's objectives.

The dependent variables in this study were knowledge, attitudes, and practices. The definitions of knowledge and attitudes were based on Kaliyaperumal^{6,12,19}. The definition of practices was formulated by the authors, drawing from the relevant literature on the subject^{4,12,16,17}.

The cutoff points for each variable were established arbitrarily, given the absence of specific criteria in the literature.

- Knowledge - the healthcare professional's understanding of caregiving situations experienced by ICs of OILDs. The variable was classified as satisfactory or unsatisfactory. It was considered that the professional had satisfactory knowledge when they answered correctly to at least six out of the nine questionnaire questions.
- Attitudes - the preconceived ideas, opinions, feelings, predispositions, and beliefs of healthcare professionals regarding ICs of OILDs that positively or negatively influence the professional's behavior or practice in relation to the caregiver. The variable was classified as favorable or unfavorable. An attitude was considered favorable if the professional answered in line with the expected response to at least eight out of the 13 questionnaire questions.

- Practices - healthcare professionals' actions directed towards caregivers of OILDs, such as guidance, support services, and health education. The variable was classified as sufficient or insufficient. A practice was considered sufficient when the professional responded with "yes" to at least four out of the six practices listed in the questionnaire. The option "sometimes" was grouped with "no" because the practice was not carried out routinely.

The independent variables included sociodemographic factors: age, gender, and professional factors: occupation, years since graduation, highest degree earned, primary area of practice, training in geriatrics or gerontology, length of employment in the unit, receipt of content related to dementia and caregivers, types of content received, dementia training, and type of training received.

A descriptive analysis was conducted and presented in tables with absolute and relative frequencies for each variable. To assess the association between the dependent variables and the sociodemographic and professional variables, the Fisher's exact test was employed, with a significance level of 5%.

This research adhered to all ethical principles and was approved by the Research Ethics Committee in Health at the Universidade Federal do Mato Grosso (UFMT) under opinion number 5.057.043 and Certificate of Presentation of Ethical Appraisal (Certificado de Apresentação de Apreciação Ética - CAAE) number 47143021.5.0000.8124.

DATA AVAILABILITY

The entire dataset supporting the results of this study is available upon request to the corresponding author, Monique Maira Maciel.

RESULTS

Among the 40 participants in this study, half of them are nurses, with 90% of them being female, and 40% falling into the age group between 40 and 50 years. As for the physicians, 65.5% of them are female and fall within the age group between 30 and 34 years.

Regarding academic qualifications, 70% of nurses have nine to 17 years of undergraduate education, while 75% of physicians have two to eight years. Of the nurses, 80% have postgraduate degrees, while 55% of physicians hold such qualifications. Only one physician (5%) has training in geriatrics and gerontology, and no nurses (0%) have training in gerontology. A significant portion of nurses (85%) and physicians (95%) received content related to dementia through classroom-based instruction. Moreover, 90% of nurses and 95% of physicians did not receive content related to caregivers. The majority of nurses (90%) and physicians (60%) did not receive training on dementia after completing their education.

Regarding their work, the majority of nurses (70%) and physicians (85%) have worked longer in Primary Care. Furthermore, 80% of nurses and 90% of physicians have been employed in the same unit for less than three years.

In the classification of healthcare professionals' knowledge, attitudes, and practices regarding caregiving situations experienced by ICs of OILDs, according to the criteria established for this study, 100% of the healthcare professionals have satisfactory knowledge and favorable attitudes. As for practices, the vast majority (92.5%) have insufficient practices related to these situations (Table 1).

Table 1. Distribution of healthcare professionals according to the classification of knowledge, attitudes, and practices regarding informal caregivers of OILDs. Tangará da Serra - MT, 2022 (N=40).

Variable	n (%)
Knowledge	
Satisfactory	40 (100.0)
Unsatisfactory	0 (0.0)
Attitude	
Favourable	40 (100.0)
Unfavorable	0 (0.0)
Pratice	
Sufficient	3 (7.5)
Insufficient	37 (92.5)

Source: Authors, 2022.

Regarding healthcare professionals' knowledge about caregiving situations experienced by ICs of OILDs, 90% of the participants believe that caregivers lack sufficient knowledge about what dementia is and its treatments (95%). Additionally, all professionals believe that caregivers can suffer physical consequences such as body pain and insomnia due to caregiving, as well as mental and/or emotional repercussions like anxiety, stress, and depression. Furthermore, 97.5% believe that there are social consequences for caregivers, including job loss, reduced income, and social isolation, and they may also experience loneliness and a sense of familial abandonment. Of the professionals in the study, 95% responded that caregivers are not adequately trained to care for individuals with dementia, 87.5% believe that caregivers have difficulties in self-care, and all are aware that it is common for caregivers to face difficulties in caring for individuals with dementia.

About healthcare professionals' attitudes toward caregiving situations experienced by ICs of OILDs, the majority believe that caregivers have insufficient knowledge about what dementia is (92.5%) and its treatments (97.5%). All professionals believe that as a result of caregiving, caregivers may experience physical and mental and/or emotional consequences, and 95% believe they may face social consequences. Overall, 97.5% believe that caregivers are not

adequately trained to care for individuals with dementia and that it is common for them to face difficulties in caring for OILDs. All professionals believe that healthcare professionals who provide care to OILDs should provide caregivers with information about the disease, care, and support services. They consider it important to support and guide caregivers about dementia and care for the elderly. They also believe that during the care of OILDs with dementia, healthcare professionals should take the time to listen to the needs of the caregiver and be concerned about them during the care of OILDs with dementia. Approximately 82.5% of professionals believe that caregivers have difficulties in self-care, and only 15% believe that caregivers are responsible for seeking help, while the rest believe that it is the responsibility of the healthcare professional to wait for this demand.

Concerning the healthcare professionals' practices in relation to caregiving situations experienced by ICs of OILDs, as shown in Table 2, 67.5% of professionals responded that they occasionally provide information or guidance to caregivers, 65% occasionally conduct home visits, 82.5% do not provide team training, 72.5% do not provide health education, 50% sometimes conduct consultations with caregivers, and none of the professionals provide caregiver support groups.

Table 2. Types and frequency of actions performed by healthcare professionals during the care of OILDs and types of information/guidance provided to caregivers by healthcare professionals. Tangará da Serra - MT, 2022 (N=40).

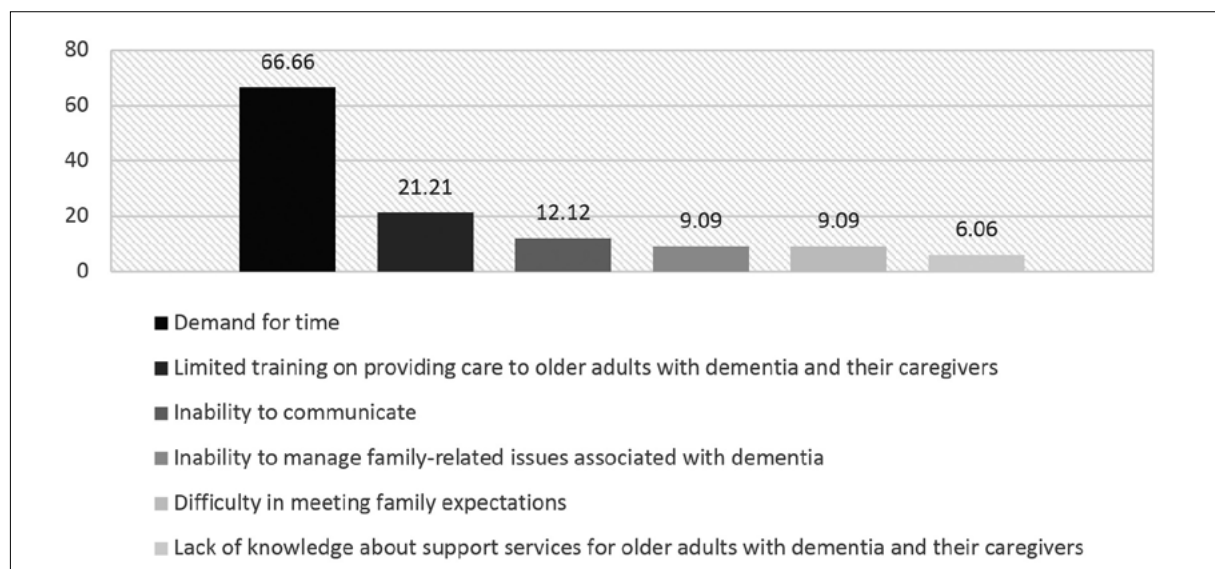
Type of action	Yes n (%)	No n (%)	Sometimes n (%)
Information/guidance	12 (30.0)	1 (2.5)	27 (67.5)
Home visits	8 (20.0)	6 (15.0)	26 (65.0)
Team qualification	1 (2.5)	33 (82.5)	6 (15.0)
Support group	0 (0.0)	40 (100.0)	0 (0.0)
Health education	3 (7.5)	29 (72.5)	8 (20.0)
Consultation with the caregiver	4 (10.0)	16 (40.0)	20 (50.0)
Type of information/guidance	Yes n (%)	No n (%)	Sometimes n (%)
About the disease	10 (25.0)	9 (22.5)	21 (52.5)
About diagnosis	3 (7.5)	27 (67.5)	10 (25.0)
About treatment	8 (20.0)	14 (35.0)	18 (45.0)
About support services	10 (25.0)	30 (75.0)	0 (0.0)
About caregiving for OILD	12 (30.0)	5 (12.5)	23 (57.5)
About books, websites, papers on dementia	4 (10.0)	33 (82.5)	3 (7.5)

Source: Authors, 2022.

As for the information/guidance provided by healthcare professionals to caregivers, Table 2 also shows that 52.5% of professionals occasionally provide information about the disease, 67.5% do not inform about the diagnosis, 45% occasionally provide information about treatment, 75% do not inform about support services, 57.5% sometimes provide information

about caregiving for OILDs, and 82.5% do not recommend sources of information about dementia.

The reasons why healthcare professionals do not provide or only occasionally provide information/guidance and do not perform or only occasionally perform actions for caregivers are shown in Image 1.

**Figure 1.** Reasons why healthcare professionals do not provide or only occasionally provide information/guidance and do not perform or only occasionally perform actions for caregivers. Tangará da Serra - MT, 2022.

Source: Authors, 2022.

Table 3. Percentage distribution of the classification of healthcare professionals' practices regarding informal caregivers of older adults with dementia, according to personal and professional data. Tangará da Serra, MT, 2022 (N=40).

Variable	Unsatisfactory Practice		Value of p^1
	n (%)	n (%)	
Age (in Years)			0.218
26 - 29	4 (10.8)	0 (0.0)	
30 - 34	17 (46.0)	1 (33.3)	
35 - 39	6 (16.2)	2 (66.7)	
< 40	10 (27.0)	0 (0.0)	
Sex			0.455
Female	28 (75.7)	3 (100.0)	
Male	9 (24.3)	0 (0.0)	
Profession			0.500
Nurse	19 (51.3)	1 (33.3)	
Physician	18 (48.7)	2 (66.7)	
Years of education (in Years)			0.538
2 - 8	19 (51.3)	2 (66.7)	
9 - 17	18 (48.7)	1 (33.3)	
Highest degree			0.704
Graduation	12 (32.4)	1 (33.3)	
Postgraduate diploma	25 (67.6)	2 (66.7)	
Area where they worked the most			0.455
Primary Care	28 (75.7)	3 (100.0)	
Others	9 (24.3)	0 (0.0)	
Education in geriatrics and gerontology / gerontology			0.925
Yes	1 (2.7)	0 (0.0)	
No	36 (97.3)	3 (100.0)	
Years working in the unit			0.394
Up to 3	32 (86.5)	2 (66.7)	
More than 3	5 (13.5)	1 (33.3)	
Received content on dementia			0.723
Yes	33 (89.2)	3 (100.0)	
No	4 (10.8)	0 (0.0)	
Received content on caregivers			0.786
Yes	3 (8.1)	0 (0.0)	
No	34 (91.9)	3 (100.0)	
Participated in dementia training			0.149
Yes	8 (21.6)	2 (66.7)	
No	29 (78.4)	1 (33.3)	

¹Fisher's exact test. Source: Authors, 2022.

Due to the lack of variability in the responses to the questions related to the dependent variables of knowledge and attitudes, as 100% of the participants met the classification criteria for the answers established, bivariate analysis between the dependent and independent variables was only conducted with the dependent variable "Practices." As a result, it can be observed in Table 3 that after bivariate analysis, there was no significant association between the practices of healthcare professionals regarding informal caregivers of older adults with dementia and the personal and work characteristics of the professionals.

DISCUSSION

According to the literature review conducted, no studies were found that aimed to investigate the knowledge, attitudes, and practices (KAP) of healthcare professionals regarding the care situations experienced by caregivers of older individual living with dementia (OILD). From what is known in the literature, there are several studies using the KAP methodology, but the focus is on the knowledge, attitudes, and practices of healthcare professionals regarding dementia or OILD^{20,21}. In this sense, there is a scarcity of studies that allow for result comparisons. However, examining related literature, some conjectures can be made regarding the results.

The main result of this study shows that healthcare professionals, in their relationship with ICs during the care of OILD, have satisfactory knowledge and favorable attitudes but insufficient practices regarding caregivers and the care situations they experience.

Regarding knowledge, there is evidence from research that highlights a lack of knowledge among healthcare professionals regarding dementia^{16,17}, diagnoses, and treatment. Studies indicate that professionals report deficiencies in content and training related to dementia during their education, which hampers their ability to care for patients with this condition. A systematic review of 19 studies found a significant deficit in the knowledge of nurses regarding care for OILDs²¹. Similarly, an integrative review of 38 studies revealed that the knowledge

of healthcare professionals about dementia, both in developed and developing countries, is moderate. This is linked to limited professional training and inadequate education²². This information aligns with the educational background of the participants in this study, who reported having limited education on dementia.

In this context, the finding that professionals have satisfactory knowledge about caregivers and the caregiving situations they experience is noteworthy. A comprehensive education on dementia should encompass not only disease-related content but all aspects of the experiences of individuals living with it. This way, healthcare professionals would theoretically understand the caregiving conditions for OILDs.

One possible explanation for the findings in this study is that the knowledge professionals claim to have about caregivers may come from their practical experience in caring for OILDs. This is supported by a study conducted in Beijing, where physicians and nurses stated that they gained experience in dementia care through clinical practice, books, and the internet¹⁷. Similarly, in another study in England, healthcare professionals reported ambivalence about the value of their dementia education as part of their professional qualification. They expressed that learning through experience and from their peers was more beneficial than relying solely on their formal education, suggesting that formal education could be either beneficial or not, as they learned more from practical experience and colleagues than from it²³.

Likely, listening to caregivers' demands during healthcare encounters may have provided professionals with knowledge about their situation. This was observed in a study conducted in France on the clinical practices of physicians in dementia care. In that study, physicians reported that they perceived that families of patients felt helpless, isolated, and distressed, and they heard them talk about family loneliness, feelings of abandonment, and frustration in trying to understand social services²⁴. Furthermore, in another study, healthcare professionals stated that they were aware that among the various burdens caregivers bear, the psychological burden is the most severe⁶.

Certainly, over time, experience provides several opportunities to get to know PWD and their caregivers, especially in Primary Care, where there are more chances for regular encounters between professionals and them, whether at the healthcare facility or during home visits. However, knowledge acquired solely through experience brings a lot of subjectivity, resulting in uncertainty, insecurity, delays, or a lack of problem resolution. The literature demonstrates that many of the caregivers' needs are not taken into account or are not addressed by professionals, and caregivers expect this from those who assist them^{22,25}.

In light of this, it is advocated that healthcare professionals, instead of solely acquiring knowledge about dementia and individuals living with the disease through experience, seek scientific knowledge through training, education, specialized literature, and reputable organizations' websites to enhance the quality of their care for these individuals.

Regarding the finding of this study that healthcare professionals have favorable attitudes towards the situation of ICs providing care for OILDs, there are studies in the literature on healthcare professionals' attitudes towards dementia care that indicate they have positive attitudes towards caregivers.

Findings consistent with favorable attitudes demonstrate that healthcare professionals express empathetic attitudes in their communication with the patient and the caregiver and are concerned about the caregiver's suffering and burden arising from caring for OILDs^{6,16,26,27}. According to the literature, professionals believe that caregivers need support and counseling²⁰; they consider it important to dedicate time not only to the patient but also to the caregiver, assisting them in coping with the consequences of the disease¹⁶. Furthermore, professionals think they should provide knowledge about the disease to help caregivers deal with the condition's consequences¹³.

The result that the professionals in this study have favorable attitudes indicates that they may hold positive attitudes toward caregivers of OILDs. This is important because it contributes to the quality of care provided by physicians and nurses in dementia. Nevertheless, considering that the literature shows negative attitudes toward caregivers^{5,12,13,16,26,27}, it

is essential that training programs include in their curricula not only content about dementia but also focus on educating professionals capable of having positive attitudes toward those living with the disease and its consequences.

The result of this study, indicating that the healthcare professionals' practices concerning the situation of ICs providing care to OILDs are insufficient, reveals a paradox between the knowledge and attitudes of the participants in this study regarding caregivers and their actual practices. These practices are not aligned with the needs identified in these caregivers and those that the professionals believe they have.

The finding of insufficient practices among healthcare professionals is consistent with the existing literature, particularly concerning information, guidance, and support. Studies involving professionals have shown that they offer little to no information or education about dementia to caregivers^{12,17,25}, provide limited psychological help^{12,17} and support, and offer some form of counseling²⁰.

Similarly, there are studies in which caregivers report not receiving as much information as they would like¹² and receiving little to no information²⁸. Furthermore, studies indicate that the information provided about the disease is not very clear¹¹ and that professionals tend to focus more on medications than on dementia, its implications, and care practices⁵.

When it was observed that both nurses and physicians are failing to perform essential practices, primarily related to providing information and guidance, as well as support and health education, it highlights a deficiency in the attention given by primary healthcare professionals to caregivers of OILDs. The inadequacy of these practices contributes to caregivers experiencing not only physical burden but also psychosocial distress. The literature underscores that caregivers express that the lack of attention from healthcare professionals leads to anxiety and stress¹¹, confusion, tension, and uncertainty⁹.

Similarly, studies demonstrate that the more knowledge the caregiver has about the disease, the lower the burden they experience²⁹, and that

providing information and guidance to caregivers of patients with dementia about the symptoms, disease progression, and treatment can improve depression and burden³⁰.

In this regard, healthcare professionals and services, especially those in Primary Care, can rely on a body of scientific evidence that supports best practices in the care of OILDs and their caregivers^{30,31}. These are studies that demonstrate the effectiveness of support groups for caregivers to better cope with the disease and its consequences.

Similarly, with the advent of technology, studies have demonstrated new possibilities for supporting these caregivers through the use of websites, videos, and apps²⁸. For example, a meta-analysis aimed at examining the effect of web-based interventions focused on caregivers indicated positive effects on caregiver self-efficacy, self-esteem, and caregiver stress¹⁰. Additionally, another study that provided professional support to caregivers of OILDs via telephone showed an improvement in caregiver burden, depression, and caregiver self-efficacy³².

Furthermore, to provide more and better information, healthcare professionals can use tools and resources to assist caregivers such as brochures, books, and instructional materials⁵. Professionals can also consider the use of electronic resources, such as the internet, media, and smartphones, as sources of health information²⁵.

Regarding the reasons presented by healthcare professionals in this study for not taking actions directed at caregivers, studies have shown similar reasons. These reasons include lack of time^{5,17,27,33}, communication difficulties²⁷, and challenges in managing family issues associated with dementia³³ and also family expectations¹⁶. Additionally, limited training on caring for OILDs patients and their caregivers^{16,17,22,26,33}, as well as insufficient knowledge about support services^{5,27}, contribute to these challenges.

It's evident that these reasons encompass both personal factors related to the professionals themselves, such as knowledge gaps and difficulties in managing familial issues associated with dementia,

as well as systemic factors connected to the healthcare services and institutions where they work, including time constraints and inadequate training on caring for OILDs patients and their caregivers. These combined challenges underscore the need for comprehensive support and interventions for both professionals and the services they provide.

Absolutely, addressing these barriers is crucial to improving the care provided to both caregivers and OILD patients. Educational institutions should focus on better preparing nurses and physicians to meet the needs of these individuals, and healthcare services should invest in ongoing professional development for their staff. Initiatives like establishing support groups have been recommended as a cost-effective means of assisting caregivers and OILD patients, as they offer opportunities for learning and interaction while keeping financial costs low³¹.

The lack of association between the "practices" variable and the independent variables may indeed be influenced by the sample size and its homogeneity in terms of the professional and sociodemographic characteristics of the participants.

Furthermore, the fact that 100% of the professionals in the study demonstrated knowledge and favorable attitudes towards caregivers may suggest that the instrument used for this research had limited discriminatory power, despite the validation process it underwent. The explanation for all professionals in this study having knowledge and favorable attitudes towards caregivers may be related to their experience in providing care to OILDs. However, it's possible that there was a courtesy bias in this study, where people "tend to provide responses they believe are correct, acceptable, and appreciated when faced with a research question"³⁴. Additionally, considering that attitudes are a construct that involves cognitive and affective components and a tendency to act³⁵, and that they are "a relatively enduring belief system about a subject, object, or concept that predisposes a person to respond in a preferential way"¹⁴, it's possible that professionals made their attitude statements regarding caregivers in an effort to respond to the researcher in a manner that aligns with socially desirable responses. To reduce this type of bias in future research, it's recommended that

data collection be conducted through self-administered online or printed questionnaires.

CONCLUSION

This study identified that the knowledge of healthcare professionals is satisfactory, their attitudes are favorable, and their practices are insufficient. The insufficient practices of physicians and nurses directly impact the lives of informal caregivers and the care of elderly individuals living with dementia. Therefore, there is a need to invest in the training and continuing education of healthcare professionals, particularly nurses and physicians, to improve their attention to both caregivers and elderly individuals living with dementia.

This research has some limitations. The first is related to the data collection instrument, which showed limited discriminatory power, even though it was validated by experts. The second pertains to the courtesy bias, which occurs when people provide responses they believe are correct or socially acceptable. The findings also provide insights for primary healthcare professionals to reconsider their caregiving practices, aiming to provide greater support to informal caregivers of elderly individuals living with dementia through home visits, caregiver consultations, and support group formation. A suggestive question for future studies is the need for interventions that promote better healthcare practices for this population.

REFERENCES

1. World Health Organization. Global status report on the public health response to dementia: executive summary. [Internet]. Geneva: WHO; 2021 [Cited: 2022 Jun. 22]. 137 p. Available at: <https://www.who.int/publications/i/item/9789240033245>
2. Gauthier S, Rosa-Neto P, Morais JA, Webster C. World Alzheimer Report 2021: Journey through the diagnosis of dementia. London, England: Alzheimer's Disease International, 2021.
3. Brasil. Ministério da Saúde. Secretaria de atenção primária à saúde. Ministério da Saúde debate Primeiro Relatório Nacional sobre a Demência. Brasília: Ministério da Saúde, 2022.
4. Pereira LSM, Soares SM. Fatores que influenciam a qualidade de vida do cuidador familiar do idoso com demência. *Ciência & Saúde Coletiva*. 2015;20(2): 3839-51.
5. Jensen CJ, Inker J. Strengthening the dementia care triad: identifying knowledge gaps and linking to resources. *Am. j. alzheimers dis. other demen.* 2015;30(3):268–75.
6. Krutter S, Schaffler-Schaden D, Essl-Maurer R, Wurm L, Seymer A, Kriechmayr C, et al. Comparing perspectives of family caregivers and healthcare professionals regarding caregiver burden in dementia care: results of a mixed methods study in a rural setting. *Age Ageing*. 2020;49(2):199–207.

AUTHORSHIP

- Monique Maira Maciel – Responsible for the conceptualization and analysis and interpretation of data; paper writing; approval of the version to be published; responsible for all aspects of the work.
- Annelita Almeida Oliveira Reiners - Responsible for the conceptualization and analysis and interpretation of data; paper writing; approval of the version to be published; responsible for all aspects of the work.
- Carla Rafaela Teixeira Cunha - Responsible for the conceptualization and analysis and interpretation of data; paper writing; approval of the version to be published; responsible for all aspects of the work.
- Rosemeiry Capriata de Souza Azevedo - Responsible for the conceptualization and analysis and interpretation of data; paper writing; approval of the version to be published; responsible for all aspects of the work.
- Joana Darc Chaves Cardoso - Critical review of the paper; approval of the version to be published.
- Amanda Cristina de Souza Andrade - Responsible for the analysis and interpretation of data.

Edited by: Priscila de Freitas Bastos Pazos

7. Schmidt MS, Locks MOH, Hammerschmidt KS de A, Fernandez DLR, Tristão FR, Girondi JBR. Challenges and technologies of care developed by caregivers of patients with Alzheimer's disease. *Rev. bras. geriatr. gerontol.* 2018;21(5):579–87.
8. Teixeira ILN, Nunes S dos S, Anversa ETR, Flores GC. Qualidade de vida do cuidador familiar de idoso com Alzheimer: uma revisão de literatura / Quality of life of the family care of the elderly with Alzheimer: a literature review. *Braz. J. Hea. Rev.* 2021;4(2):5221–37.
9. Moyle W, Bramble M, Bauer M, Smyth W, Beattie E. “They rush you and push you too much ... and you can't really get any good response off them”: a qualitative examination of family involvement in care of people with dementia in acute care. *Australasian journal on ageing.* 2016;35(2):30–4.
10. Ploeg J, Ali MU, Markle-Reid M, Valaitis R, Bartholomew A, Fitzpatrick-Lewis D, McAiney C, Sherifali D. Caregiver-focused, web-based Interventions: systematic review and meta-analysis (part 2). *J. med. internet res.* 2018;20(10):11247.
11. Fitzgerald JA, Curry J, Olde Meierink A, Cully A. Putting the consumer in the driver's seat: a visual journey through the Australian health-care system as experienced by people living with dementia and their carers. *Australasian journal on ageing.* 2019;38(S2):46–52.
12. Lapidou D, Middlemass J, Karran T, Siriwardena AN. Caregivers' interactions with health care services – mediator of stress or added strain? Experiences and perceptions of informal caregivers of people with dementia – a qualitative study. *Dementia.* 2019;18(7–8):2526–42.
13. Thyrian JR, Hoffmann W. Dementia care and general physicians - A survey on prevalence, means, attitudes and recommendations. *Cent. eur. j. public health.* 2012;20(4):270–5.
14. Andrade C, Menon V, Ameen S, Kumar Praharaj S. Designing and conducting knowledge, attitude, and practice surveys in psychiatry: practical guidance. *Indian. j. psychol. med.* 2020;42(5):478–81.
15. Instituto Brasileiro de Geografia e Estatística. Cidades. 2022. [Internet]. [Cited: 2022 Jan. 06]. Available at: <https://cidades.ibge.gov.br/brasil/mt/tangara-da-serra/panorama>
16. Constantinescu A, Li H, Yu J, Hoggard C, Holroyd-Leduc J. Exploring rural family physicians' challenges in providing dementia care: a qualitative study. *Can. j. aging.* 2018;37(4):390–9.
17. Wang M, Shao S, Li J, Liu Y, Xu X, Du J. The needs of informal caregivers and barriers of primary care workers toward dementia management in primary care: a qualitative study in Beijing. *BMC fam. pract.* 2018;19(1):1-9.
18. Alexandre NMC, Coluci MZO. Validade de conteúdo nos processos de construção e adaptação de instrumentos de medidas. *Ciênc. Saúde Colet.* 2011;16(7):3061–8
19. Kaliyaperumal K. Guideline for conducting a knowledge, attitude and practice (KAP) study. *Community Ophthalmology.* 2004; 4(1):7-9.
20. Giezendanner S, Monsch AU, Kressig RW, Mueller Y, Streit S, Essig S, et al. General practitioners' attitudes towards early diagnosis of dementia: a cross-sectional survey. *BMC fam. pract.* 2019; 20(1):1-9.
21. Evripidou M, Charalambous A, Middleton N, Papastavrou E. Nurses' knowledge and attitudes about dementia care: systematic literature review. *Perspect. psychiatr. care.* 2019;55(1):48-60.
22. Zhao W, Jones C, Wu ML, Moyle W. Healthcare professionals' dementia knowledge and attitudes towards dementia care and family carers' perceptions of dementia care in China: an integrative review. *J. clin. nurs.* 2022;31(13–14):1753–75.
23. Dodd E, Cheston R, Cullum S, Jefferies R, Ismail S, Gattung L, et al. Primary care-led dementia diagnosis services in South Gloucestershire: themes from people and families living with dementia and health care professionals. *Dementia.* 2016;15(6):1586–604.
24. Lahjibi-Paulet H, Dauffy Alain A, Minard A, Gaxatte C, Saint-Jean O, Somme D. Attitudes toward Alzheimer's disease: a qualitative study of the role played by social representation on a convenient sample of French general practitioners. *Aging clin. exp. res.* 2012.24(4):384-90.
25. Soong A, Au ST, Kyaw BM, Theng YL, Tudor Car L. Information needs and information seeking behaviour of people with dementia and their non-professional caregivers: a scoping review. *BMC geriatr.* 2020;14;20(1):1-17.
26. Hsiao HY, Liu Z, Xu L, Huang Y, Chi I. Knowledge, attitudes, and clinical practices for patients with dementia among mental health providers in China: city and town differences. *Gerontol. geriatr. educ.* 2016;37(4):342-358.
27. Mansfield E, Noble N, Sanson-Fisher R, Mazza D, Bryant J, Heyn PC. Primary care physicians' perceived barriers to optimal dementia care: a systematic review. *Gerontologist.* 2019;58(6):697–708.

28. Peterson K, Hahn H, Lee AJ, Madison CA, Atri A. In the information age, do dementia caregivers get the information they need? Semi-structured interviews to determine informal caregivers' education needs, barriers, and preferences. *BMC geriatr.* 2016;16(1):1-13.
29. Scott CB, Clay OJ, Epps F, Cothran FA, Williams IC. Associations of knowledge of Alzheimer's disease and memory loss and employment status with burden in African American and Caucasian family caregivers. *Dementia.* 2020;19(3):847-60.
30. Terayama H, Sakurai H, Namioka N, Jaime R, Otakeguchi K, Fukasawa R, et al. Caregivers' education decreases depression symptoms and burden in caregivers of patients with dementia. *Psychogeriatrics.* 2018;18(5):327-33.
31. Mendes GA, Faustino AM, Santos CTB dos, Cruz KCT da. Apoio a cuidadores familiares de idosos com demência. *Braz. J. Hea. Rev.* 2020;6(10):76828-39.
32. Possin KL, Merrilees JJ, Dulaney S, Bonasera SJ, Chiong W, Lee K, et al. Effect of collaborative dementia care via telephone and internet on quality of life, caregiver well-being, and health care use: the care ecosystem randomized clinical trial. *JAMA intern. med.* 2019;179(12):1658-67.
33. Stewart T V., Loskutova N, Gallihier JM, Warshaw GA, Coombs LJ, Staton EW, et al. Practice patterns, beliefs, and perceived barriers to care regarding dementia: areport from the American Academy of Family Physicians (AAFP) National Research Network. *J. am. board fam. med.* 2014;27(2):275-83.
34. Launiala A. How much can a KAP survey tell us about people's knowledge, attitudes and practices? Some observations from medical anthropology research on malaria in pregnancy in Malawi Background: KAP surveys [Internet]. 2009; 1. [Cited: 2022 Ago. 11] Available at: <http://www.anthropologymatters.com>
35. Raina S. Assessment of knowledge, attitude, and practice in health care delivery. *North am. j. med. sci.* 2013;5(3):249-50.



Acceptability of a home-based multicomponent exercise program (Vivifrail®) for the oldest-old via videoconferencing during the Covid-19 pandemic

Ana Paula Tiecker¹ Eduardo Lusa Cadore² Mikel Izquierdo³ Gabriela Guimarães Oliveira Zmuda¹ Francielle Bonett Aguirre¹ Ângelo José Gonçalves Bós¹

Abstract

Objective: To investigate the acceptability and adequacy of a multicomponent exercise program via videoconferencing for the oldest-old in Porto Alegre, a city in southern Brazil. **Method:** This is a quasi-experimental study. Fourteen participants were enrolled in the multicomponent exercise program Vivifrail® for 12 weeks, 5 days a week, with weekly video calls for assessment of acceptability and adequacy. The acceptability and adequacy questionnaire was based on 6 barriers that older adults face when engaging in physical exercise. Responses were measured using a 5-point Likert scale ranging from 0 to 4 points, with a maximum score of 24 points (maximum acceptability). **Results:** Fourteen participants (89.07±6.30 years) concluded the protocol, with an acceptability rate of 70%. Internal consistency was moderate, with a Cronbach's coefficient alpha of 0.7. Participants showed an overall increase in acceptability and adequacy (from 17.8±3.51 points in the first week to 22.0±2.94 in the 12th week). Four participants (28.6%) required some modification to the exercise protocol. **Conclusion:** The Vivifrail® protocol, together with weekly follow-up via videoconferencing, was well accepted and adequate. It could be an important tool for promoting quality of life, especially in the oldest-old with difficulty leaving home. The acceptability questionnaire was able to detect exercise barriers and suggest possible modifications to the training program and could be presented as a suggestion for the evaluation of intervention protocols in the oldest-old population. Therefore, the Vivifrail® protocol, with weekly follow-up via videoconferencing, could be a new field of intervention for health professionals.

Keywords: Public Health. Aged, 80 and over. Exercise. Longevity. Covid-19.

¹ Pontifícia Universidade Católica do Rio Grande do Sul – PUCRS, Escola de Medicina. Porto Alegre, RS, Brasil.

² Universidade Federal do Rio Grande do Sul – UFRGS, Escola de Educação Física. Porto Alegre, RS, Brasil.

³ Universidad Pública de Navarra, Departamento de Ciencias de la Salud. Navarra, España.

Funding: This study was supported by Coordenação de Aperfeiçoamento de Pessoal Nível Superior (CAPES). Process number: 001. Master scholarship.

The authors report no conflicts of interest.

Correspondence
Ana Paula Tiecker
anapaultiecker@hotmail.com

Received: April 07, 2023
Approved: October 09, 2023

INTRODUCTION

Aging is a natural, slow, and gradual process that induces biological changes throughout the body, manifested by a progressive reduction in functional capacity, which is particularly evident in the oldest-old^{1,2}. Physical inactivity, combined with chronic conditions prevalent in this age group, can lead to a higher risk of adverse health outcomes. Studies show that inactive older adults have an increased risk of falls (39%), mortality (31%), loss of independence (50%), frailty (48%), hospitalization (15%), and institutionalization (21%) compared with physically active counterparts³⁻⁵. Annually, physical inactivity is estimated to incur \$53 million in public health expenses globally⁶.

Physical exercise is crucial for the promotion of a healthy phenotype in older adults, and its main benefits include the improvement of functional capacity and the preservation of autonomy and independence for longer⁷. Benefits have been reported for different exercise modalities, such as resistance training, aerobic training, pilates, among others⁸⁻¹⁰. However, choosing the right type of exercise is extremely important.

According to the World Health Organization (WHO)¹¹, for older individuals to obtain significant gains, they should adhere to exercise programs that promote the development of physical fitness components such as aerobic capacity, muscular endurance, balance, and flexibility, that is, multicomponent training. However, physical exercise interventions in the oldest-old have not been reported as frequently as in the youngest-old¹². Likewise, little is known about the acceptability and adequacy of a multicomponent physical exercise program for the oldest-old. Biehl-Printes et al.¹³ reported that lack of interest was the main reason for the oldest-old not participating in physical exercise programs. Krug Lopes & Mazo¹² also mentioned reasons such as physical limitations, poor disposition, excessive care from family members, and inadequate exercises (insufficient or very intense).

Promoting healthy practices and behaviors among older individuals is crucial, especially during periods such as the Covid-19 pandemic, in which containment

strategies such as the lockdown negatively impacted the health of the population¹⁴. On the other hand, the lockdown made older adults more familiar with technologies such as videoconferencing¹⁵. Therefore, home-based exercise programs via videoconferencing can be an alternative to improve or maintain functional capacity in this population¹⁴, and may also be well received in periods other than the pandemic, as home exercises had already been proven to benefit older adults long before Covid-19^{16,17}.

In this context, Vivifrail® was developed as a multicomponent home exercise program to improve the functional capacity of older adults¹⁸. The program proposes different exercise protocols based on the participant's functional capacity, ranging from frail to robust states. However, to date, no study has investigated the acceptability and adequacy of this type of intervention in the oldest-old. Therefore, this study aims to investigate the acceptability and adequacy of a home-based multicomponent exercise program via videoconferencing among the oldest-old in Porto Alegre, a city in southern Brazil.

METHODS

This is a quasi-experimental study with a repeated measures design, involving weekly monitoring of exercise acceptability. Participants were recruited from follow-up studies of nonagenarians previously enrolled in home-based research and healthy volunteers who signed up for projects at the Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS). Participants were selected by convenience sampling through telephone calls in which the researcher explained the study to the participant, who agreed to participate or not.

The study was approved by the institutional Research Ethics Committee (number 21628419.9.0000.5336) and was conducted in accordance with the Declaration of Helsinki¹⁹.

The inclusion criteria were patients aged ≥ 80 years previously enrolled in PUCRS projects. The exclusion criteria were not having a smartphone for videoconferencing, not having a companion available during the evaluation and practice of the proposed exercises, and inability to respond to verbal

commands, in addition to the exclusion criteria defined by the Vivifrail® protocol¹⁸.

Initially, the study was presented to potential participants or their caregivers by phone, and a video call was scheduled for the initial evaluation. The lead researcher emphasized the importance of a caregiver or family member being present during the assessment and explained about the Informed Consent Form (ICF), which was sent by mail for signature.

After the participant signed the ICF, the trained researcher conducted the physical assessment and administered the comprehensive questionnaire on sociodemographic and clinical conditions at the initial, intermediate (6 weeks), and final (12 weeks) assessments via videoconferencing. The instrument on sociodemographic and clinical conditions collected information on the presence of symptoms and illnesses related to exclusion criteria or that could interfere with the acceptance of exercise practices (joint pains, depression, or dizziness). It also inquired about physical exercise routines, falls, ease or difficulty in performing functional activities, cognition, and memory (Geriatric Depression Scale and Mini-Mental State Examination). Physical evaluation was conducted according to Vivifrail® recommendations to determine the best exercise passport based on the participant's functional capacity and risk of falls¹⁸. Functional capacity was assessed using the Short Physical Performance Battery (SPPB) and the risk of falls was assessed using a 4-step protocol. The assessment was described in full by Izquierdo et al.¹⁸

Chart 1 shows the best exercise passport according to the functional assessment score (SPPB).

The exercise program took place from October to December 2020, 5 times a week, totaling 60 sessions

over 12 weeks. Each participant received an exercise passport (protocol manual) by mail and performed the exercises at home with the presence of an adult caregiver. The researcher contacted the participants weekly via videoconferencing to monitor the exercises, clarify any potential questions or issues, and evaluate acceptability of exercises, as described below.

Each passport contains movement illustrations with descriptions of initial position, performance, final position, risks, and contraindications. All passports should be executed in a daily routine lasting 30 to 45 minutes, from Monday to Friday, over 12 weeks. In addition, each passport includes an activity diary for participants to track their progress. During "circuit" sessions, participants should perform all circuit exercises, and during "walking" sessions, participants should only walk. Patients considered at risk of falls received a passport marked with a plus (+) sign (B+ and C+). The exercise passports were published by Izquierdo et al.²⁰ and are available at: <https://vivifrail.com>.

The main outcomes measured were the acceptability and adequacy of the exercise program over 12 weeks. As there were no instruments available that could adequately assess patient progress in the setting of our study, we constructed a questionnaire to understand the difficulties and acceptability of the exercises by the participants. The questionnaire was not validated. Questions were based on the 6 barriers that older adults face when trying to engage in physical activity described by González et al.²¹ The questionnaire was administered weekly by the researcher via videoconferencing over the 12 weeks of the exercise protocol, and responses were measured using a 5-point Likert scale.

Chart 1. Classification of the Vivifrail® passport according to the functional assessment score, Porto Alegre/RS, 2021.

SPPB score	Classification
0-3	A: Disabled
4-6	B: Frail
7-9	C: Prefrail
10-12	D: Robust

Source: Izquierdo et al.¹⁸.

Participants were asked about (1) the importance they attributed to engaging in physical exercise (none/very little [0 points] to extremely important [4 points]), (2) their acceptability and satisfaction of the exercises (none/very little [0 points] to very high [4 points]), (3) the discomfort they felt during the exercises (none/very little [4]; mild [3]; indifferent/moderate [2]; very bad [1]; severe [0]), (4) how challenging it was to perform the exercises (none/very little [4]; little [3]; indifferent/moderate [2]; very challenging [1]; extremely challenging [0]), (5) exercise duration (very little/none [0]; little [2]; indifferent/sufficient [4]; a lot/extremely high [2]; too much [0]), and (6) whether the exercises could assist in activities of daily living (very little/insignificant [0 points] to extremely important [4 points]). Participants had to justify all their answers, allowing the researcher to understand the difficulties and discomforts they experienced and, when necessary, adapt some exercises according to individual needs and limitations.

The score ranges from 0 to 24 points, with higher scores indicating greater acceptability. Internal consistency assessment was performed using Cronbach's alpha, which estimates the reliability of a questionnaire constructed for research projects²². Freitas and Rodrigues²³ suggest using the following ranges to rate reliability according to Cronbach's alpha: (A) a α 0.30 – Very low; (B) $0.30 < \alpha \leq 0.60$ – Low; (C) $0.60 < \alpha \leq 0.75$ – Moderate; (D) $0.75 < \alpha \leq 0.90$ – High; and (E) $\alpha > 0.90$ – Very high.

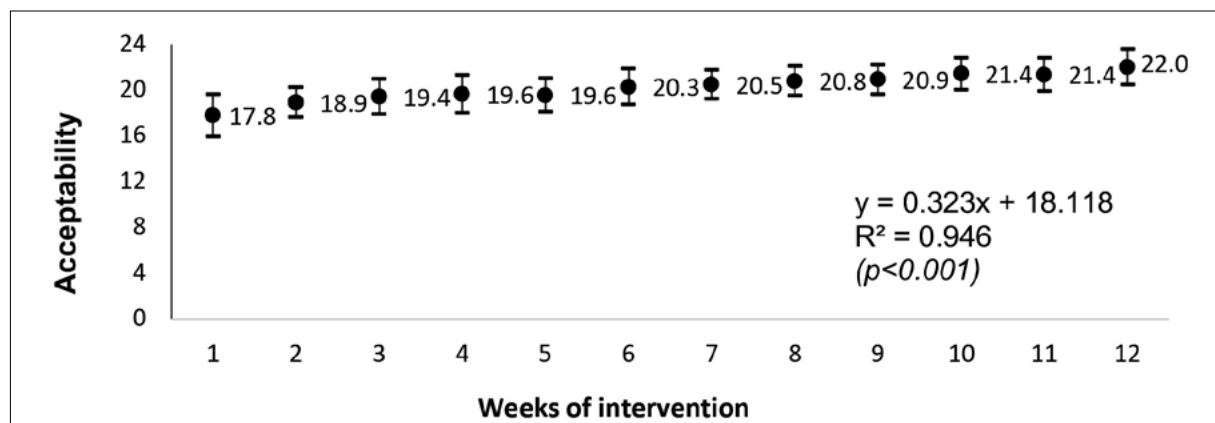
At the end of each session, an acceptability score was calculated for each participant. Pearson's linear correlation was used to assess the correlation between the degree of acceptability in each assessment and the follow-up time. A p -value < 0.05 was considered statistically significant.

DATA AVAILABILITY

The dataset supporting the results of this study is available upon request to the corresponding author Ana Paula Tiecker (ana.tiecker96@edu.pucrs.br).

RESULTS

Of 20 participants initially evaluated, 14 (70%), with a mean age of 89.07 ± 6.30 years completed the study. Reasons for dropping out included osteoarticular disease in 2 (33%) and a lack of will to continue in 4 (67%). Five (83%) of those who dropped out were women and 1 (17%) was a man, with a mean age of 93.8 ± 3.96 years. Figure 1 shows a progressive increase in exercise acceptability over the 12-week period. Pearson's linear correlation showed, with a 95% correlation, a 0.323-point increase in acceptability per week. At the end of the 12-week period, participants had an increase of 4.2 points (from 17.8 ± 3.51 to 22.0 ± 2.94), with a statically significant correlation ($p < 0.001$ and a sample power > 0.99). Statistical power was calculated using the G*Power software, assuming an alpha of 0.001, a sample size of 14, and an effect size of 50 (the maximum allowed by the program).



Source: The authors, 2022. Notes: R^2 = correlation coefficient.

Figure 1. Exercise acceptability over the 12-week intervention period, Porto Alegre/RS, 2021.

Acceptability was not improved in only 2 participants due to pain or lack of commitment. Four (28.6%) required some exercise modifications, including a participant suffering from pain and discomfort due to osteoarticular disease that required an almost complete passport change. Another participant required temporary modifications because of knee inflammation, with interruption of 2 exercises: sitting and standing, and climbing and descending stairs. Two participants needed to increase rest intervals during walking because of extreme fatigue.

Internal consistency analysis of the acceptability questionnaire yielded a consistency of 66% when including all questions. After removal of question 4, as all participants responded that exercise duration was adequate over the 12-week period, internal consistency increased to 70%. Both consistency levels are considered moderate.

Acceptability of the exercises proposed by Vivifrail® was improved in most participants, as shown in Figure 1. In the subjective assessment, participants were asked about the reasons behind their responses. The most representative responses are shown in Table 2.

Regarding the importance of performing the proposed exercises, 12 (85%) participants found it important or extremely important because exercise makes them more energetic, helps reduce pain, can help in the performance of daily activities, and because the body needs to stay healthy. Their perception did not change over the 12-week intervention period. The other 2 (15%) changed their perception from not important to little important and from not important to very important.

When asked about satisfaction with the proposed exercises, 13 (93%) participants were satisfied from the first week. Only 1 (7%) participant responded “indifferent” because they had difficulty performing the exercises. As the weeks passed, the satisfaction of the 13 participants further improved, while the other participant remained dissatisfied during the follow-up weeks because they only liked to walk and were more involved in a hobby (fixing furniture). After some adjustments, the participant became

more motivated but remained dissatisfied. At the end of the 12-week period, participants, in general, were very satisfied with the exercises.

Regarding discomfort, 10 (71%) participants felt some discomfort in the first week, including fatigue and pain during or after exercise. At the beginning of the program, 2 participants felt pain during a specific upper limb stretch, and another developed knee pain. After some adjustments (interruption or reduction of exercises that could aggravate symptoms), pain reduced and acceptability increased in these patients. After 6 weeks, 6 (42%) participants still experienced fatigue, and pain was reduced in those who reported it at the beginning of the study. Only 1 participant started experiencing pain during the follow-up weeks as a result of osteoarticular disease, which was aggravated by the exercises. The rest of the participants no longer experienced any discomfort. At the end of the 12-week program, 2 (14%) participants continued to experience some discomfort: one due to fatigue from walking, which had significantly decreased since the beginning of the program, and the other due to pain from osteoarticular disease.

Seven (50%) participants found it very or extremely difficult to perform the proposed exercises in the first week, mainly due to the time they had been without exercising. The exercise that participants found most challenging was walking within the time proposed by the passport, and some experienced difficulty even after implementation of rest intervals. Upper limb stretching was also challenging for 2 participants. The difficulty decreased with exercise adjustments, longer rest intervals, and replacement of the stretching exercise. With each passing week, participants experienced less difficulty and improved physical condition. Ten (71%) participants reported feeling very little or little difficulty at the end of the 12 weeks.

Regarding duration, all participants found it adequate since the first week. Ten (71%) participants reported that exercise could help in daily activities. As the weeks passed, not only participants but also caregivers and family members reported physical improvements and greater ease for participants in performing their daily activities.

Chart 2. Subjective assessment of responses to the acceptability questionnaire in the follow-up weeks, Porto Alegre-(RS), 2022.

	End of 1st week	End of 6th week	End of 12th week
Importance of performing the proposed exercises	Most participants found it important: "Because exercise makes you feel more energetic"; "It helps reduce pain, it can help with my daily activities"; "Because the body needs to stay healthy."	The vast majority continued to report the same level of importance, while others began to see it as more important.	The vast majority reported that the proposed exercises were very important: "My physical condition improved after exercising, my movements are better. I think it's extremely important"; "I can walk more easily and steadily."
Satisfaction in performing the exercises	The vast majority of participants were satisfied from the first week. Reasons included the following: "Because I feel better"; "Because I can do them all"; "Because it's helping with my pain." Only 1 participant responded "indifferent", as he was having difficulty performing the exercises, which were adjusted over the weeks.	Most participants were satisfied with the exercises. Only 1 participant was not satisfied and did not adhere to the exercise program because, according to him, he did not like exercising, he just liked walking. We made some adjustments to the exercise program and encouraged him to do as many times a week as possible (up to 5 times).	Participants were very satisfied with the exercises: "I'm satisfied because my physical condition has improved a lot. I am walking more easily and that makes me happy"; "Because in those 12 weeks I enjoyed it. I hoped to improve a little and I did." The participant who was not satisfied and did not adhere to the exercise program did not change his perception, as he did not like exercising.
Discomfort when performing the exercises	The vast majority felt some type of discomfort, including fatigue and pain during or after exercise. Pain during exercise was observed in 2 participants and, for both, it was related to upper limb stretching; we made some modifications to the exercise to improve acceptability. Another participant had pain due to knee inflammation. To improve acceptability, we made some adjustments to the exercises that could aggravate symptoms.	Some participants continued to experience fatigue, while pain decreased for most who reported it. One participant began to experience pain during the follow-up weeks due to osteoarticular disease; according to the participant, some exercises aggravated the pain. Some changes were made to allow participants to continue in the exercise program.	At the end of the 12 weeks, only 2 participants continued to feel discomfort during exercise. One was due to fatigue from walking and the other was due to pain from osteoarticular disease.
Difficulty performing the exercises	Half of participants found it a little difficult or extremely difficult to perform the proposed exercises in the first week. Some of the reasons included: "I haven't exercised for a long time"; "I don't do anything anymore. I don't even leave the house anymore." Walking was considered the most challenging exercise. Two participants needed to increase their rest interval during the walk.	Each week, participants who reported difficulty said it got easier and that they felt better and more energetic. Only 2 participants reported some difficulty during the follow-up period: one because he still felt very tired while walking and the other because of pain due to osteoarticular disease.	Only 2 participants continued to experience difficulty: one due to fatigue from walking, but which was related to a very reduced functional capacity, and the other because of pain due to osteoarticular disease. Both said it got better over the 12-week period.

to be continued

Continuation of Chart 2

	End of 1st week	End of 6th week	End of 12th week
Duration of exercises	All participants found exercise duration adequate.	It remained adequate for everyone.	It remained adequate for everyone.
Can physical activity help with activities of daily living?	Participants described the following expectations: "I think exercise will help me walk better"; "It will give me more strength to do the tasks here at home"; "I feel like it will help me a lot, I feel stronger now"; "When the pandemic is over, I want to be well so I can do the same activities as before, and exercise can help me with that."	With each passing week, the reports changed. The vast majority reported improvement in physical capacity, such as walking better and carrying out activities of daily living with more ease.	At the end of the 12 weeks, participants as well as caregivers and family members reported improvements in the physical condition of participants: "I have been able to feed myself every day, I feel more capable"; "I feel like I have more energy, I can do more activities throughout the day than before"; "Caregiver: She can get out of bed without much help and get dressed too"; "Participant's daughter: I no longer need to help him get up from the chair, he takes the walker and gets up on his own"; "I'm walking without a walker, now I just use a cane, I'm stronger"; "It has improved my mobility and ability to do things with my arms and hands."; "After I started exercising, I no longer felt any pain in my legs."

DISCUSSION

The main study findings demonstrate that a 12-week home-based multicomponent exercise program, supported by weekly follow-up via videoconferencing, was well-received by participants. Acceptability progressively increased over the 12-week period, with subjective reports of improvement by the participants. Weekly follow-up with application of the acceptability questionnaire via videoconferencing revealed a good acceptability rate of the exercises proposed by Vivifrail®. Moreover, the program proved to be adequate for this population of older individuals, especially during the Covid-19 pandemic, as it offered support during this challenging time.

Acceptability is crucial for treatment adherence and outcomes²⁴, particularly among the oldest-old, who are less inclined to engage in physical activity^{13,25}. Lopes et al.²⁵ showed that the place where physical activity is performed has a significant impact on acceptability by the oldest-old. Appropriate places

facilitate engagement for both active and inactive older individuals, especially if closer to home, as they (especially women) find it more difficult to leave their homes^{25,26}. Additionally, participants were in lockdown due to the Covid-19 pandemic, consequently leading to a reduction in physical exercise despite health authorities' encouragement^{14,27}. Thus, home-based activities might be better suited for these individuals.

Other factors affecting acceptability are the belief that an intervention will be effective (ie, outcome expectation) and adherence to the intervention (ie, efficacy expectation)^{25,28}. By conducting weekly follow-up via videoconferencing, we allowed participants to self-evaluate and report difficulties and improvements, which in turn allowed us to better adapt the exercises when necessary, contributing to a better acceptability rate. The literature has also shown that, before initiating an exercise program, it is important that participants receive a detailed verbal and written description of the program that informs

the frequency, intensity, duration, modality, load, and progression of the exercise²⁹. A clear description of the program promotes motivation and adherence among participants, as was observed in this study. To the best of our knowledge, data on acceptability of exercise protocols among the oldest-old are scarce, making this the first study to evaluate such outcomes in this population.

Participants' acceptability of the exercise program is crucial for achieving successful outcomes. Recent studies have suggested strategies to minimize the effects of social isolation in older people, considering the significant repercussions of physical inactivity in this population^{15,30}. Chaabene et al.¹⁶ conducted a meta-analysis to evaluate the effects of online home-based exercise programs on the physical fitness of healthy older people. They showed that home exercises can improve physical fitness and functional health aspects such as strength, muscular endurance, and balance. In Brazil, one of the few studies using an online intervention during the pandemic reported the experience of only one participant, an older adult. The online experience was positive both in terms of organization and execution, and the patient positively adhered to the program³¹. Therefore, physical exercise programs via videoconferencing, when well accepted by the participants, are an important alternative to reduce the effects of a sedentary lifestyle.

Given the paucity of studies investigating the acceptability of home-based physical exercise protocols, we sought to support our findings with different studies evaluating acceptability. Bower et al.³² evaluated, among other outcomes, the acceptability of an exercise program based on interactive gaming technology. As in this study, the authors observed a good acceptability rate among most participants (92.5%), as well as increasing acceptability as modifications were made to the interactive games. This suggests that acceptability involves various aspects of human behavior and is directly linked to adherence and continued engagement in physical exercise programs. Bacha et al.³³ evaluated postural control in older patients using Kinect Adventures versus conventional physical therapy in a controlled randomized study, assessing treatment acceptability and adherence. In terms of acceptability, both groups

were satisfied with the interventions, with a 91% adherence rate. This highlights that acceptability improves engagement in proposed activities.

In our study, multicomponent exercises were successfully administered via videoconferencing without in-person monitoring. The recent literature shows that exercises performed at home with minimal supervision produce significant health benefits for older patients³². A recent meta-analysis by Kis et al.³⁴ showed that minimally supervised home-based physical training is a safe, effective, and cost-efficient option to increase lower body muscle strength in older individuals with different health conditions.

This study has some limitations. The small sample size, lack of randomization, absence of a control group, and mandatory smartphone use might limit the generalization of results with higher evidence levels. However, mandatory smartphone use was not a major restriction on participation in this study. Another limitation is the lack of a validated acceptability questionnaire, and the fact that the proposed questionnaire had a moderate internal consistency. In addition, the results may have been influenced by the fact that the researcher who applied the acceptability questionnaire was the same person who guided the proposed intervention. The research setting, in which participants had a prior and trusting relationship with the researcher, and the fact that they were contacted and monitored during a period of psychological vulnerability, may have favored the positive results.

Nevertheless, a trust-based relationship should exist between patients and all health care professionals, and we believe a similar environment could be reproduced in other health care settings. It is important to note that, to the best of our knowledge, this is the first Brazilian study to assess the acceptability of the multimodal exercise protocol Vivifrail® during lockdown via videoconferencing. Although the lack of in-person meetings with participants presented many challenges, we were able to overcome them. From a practical perspective, our findings suggest good acceptability and adequacy of a low-cost, easy-to-follow, and monitorable exercise intervention aiming to improve functional capacity in the oldest-old, particularly during lockdown.

Home-based programs like Vivifrail® seem to be a useful strategy to promote physical activity among older individuals, particularly the oldest-old, reducing adverse effects associated with sedentary behavior in this population.

CONCLUSION

In this study, a multicomponent and individualized home training program, with weekly monitoring via videoconferencing for 12 weeks, was well accepted and adequate for a population of oldest-old individuals during lockdown in Porto Alegre, Brazil. The acceptability questionnaire was effective in detecting barriers to exercises and suggesting possible modifications to the training program; less than a third of participants required adjustments to the initially proposed program. The questionnaire constructed for this study can be used to evaluate the acceptability of exercise programs by oldest-old individuals. However, it still requires validation in future studies.

This study was able to overcome challenges not presented in other studies, transforming an unusual situation (lockdown due to Covid-19) into a potential new field of intervention for health professionals. In fact, some study researchers, after observing the acceptability of the program, started to apply Vivifrail® to their patients during online care. Considering

that the multicomponent exercise program can be performed efficiently via videoconferencing, future intervention projects with an adequate sample size and control group, using the same methodology, may provide the benefits suggested in this study.

AUTHORSHIP

- Ana Paula Tiecker was responsible for all aspects of the study, ensuring the accuracy and integrity of the study.
- Eduardo Lusa Cadore participated in the study design, interpretation of data, critical review, and approval of the final version.
- Mikel Izquierdo participated in the study design, interpretation of data, critical review, and approval of the final version.
- Gabriela Guimarães Oliveira Zmuda participated in critical review and approval of the final version.
- Francielle Bonett Aguirre participated in critical review and approval of the final version.
- Ângelo José Gonçalves Bós was responsible for all aspects of the study, ensuring the accuracy and integrity of the study.

Edited by: Yan Nogueira Leite de Freitas

REFERENCES

1. World Health Organization. World report on ageing and health. WHO; 2015.
2. Mello AC, Engstrom EM, Alves LC. Health-related and socio-demographic factors associated with frailty in the elderly: a systematic literature review. *Cad Saude Publica* 2014;30(6):1143–68. Available from: <https://doi.org/10.1590/0102-311x00148213>.
3. Lins MM, Marques APO, Leal MCC Barros RL. Risco de fragilidade em idosos comunitários assistidos na atenção básica de saúde e fatores associados. *Saúde Debate* 2019; 43(121): 520-529. Available from: <https://doi.org/10.1590/0103-1104201912118>
4. Bielemann RM, Silva BGC, Collic VN, Xavier MO, Silva SG. Impacto da inatividade física e custos de hospitalização por doenças crônicas. *Rev Saúde Pública* 2015;49(75):1-8. Available from: <https://doi.org/10.1590/S0034-8910.2015049005650>.
5. Unningham C, O' Sullivan R, Caserotti P, Tully MA. Consequences of physical inactivity in older adults: A systematic review of reviews and meta-analyses. *Scand J Med Sci Sports*. 2020 May;30(5):816-827. Available from: <https://doi.org/10.1111/sms.13616>. Epub 2020 Feb 4. PMID: 32020713.

6. Ding D, Lawson KD, Kolbe-Alexander TL, Finkelstein EA, Katzmarzyk PT, Mechelen WV. The economic burden of physical inactivity: a global analysis of major non-communicable diseases. *Lancet* 2016;388(10051):1311-1324. Available from: [https://doi.org/10.1016/S0140-6736\(16\)30383-X](https://doi.org/10.1016/S0140-6736(16)30383-X)
7. World Health Organization. WHO Clinical Consortium on Healthy Ageing 2019. WHO; 2019.
8. Ferraz SP, Batista MSS. A relevância de programas de exercícios resistidos no tratamento e prevenção da sarcopenia em idosos: uma revisão integrativa. *Resar, Society and Develop* 2021;10(15):1-10. Available from: <http://dx.doi.org/10.33448/rsd-v10i15.23362>
9. Hou N, Sun X. Effect of aerobic exercise on neuromuscular quality in the elderly. *Rev Bras Med Esporte* 2022;28(5). Available from: <http://dx.doi.org/10.33448/rsd-v10i15.23362>
10. Carvalho CBO, Dias ALM, Caldas LRR, Carneiro-Júnior MA. O método Pilates e sua influência na capacidade funcional do idoso: uma revisão sistemática. *Revista Kairós-Gerontologia* 2017;20(3):223–235. Available from: <https://doi.org/10.23925/2176-901X.2017v20i3p223-235>
11. World Health Organization. Recomendações globais sobre atividade física para a saúde. Genebra: WHO; 2010. Available from: <http://apps.who.int/iris/bitstream/10665/44399/1/978924>
12. Krug RR, Lopes MA, Mazo GZ. Barreiras e facilitadores para a prática da atividade física de longevos inativas fisicamente. *Revista Brasileira de Medicina do Esporte* 2015;21(1):57–64. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1517-86922015000100057&lng=pt&tlng=pt
13. Biehl-Printes C, Brauner FDO, Rocha JDP, Oliveira G, Neris J, Rauber B, et al. Prática de exercício físico ou esporte dos idosos jovens e longevos e o conhecimento dos mesmos em programas públicos: Pesquisa Nacional de Saúde 2013. *PAJAR* 2017;4(2):47. Available from: <http://revistaseletronicas.pucrs.br/ojs/index.php/pajar/article/view/25276>
14. López-Sánchez GF, López-Bueno R, Gil-Salmerón A, Zauder R, Skalska M, Jastrzębska J, et al. Comparison of physical activity levels in Spanish adults with chronic conditions before and during COVID-19 quarantine. *Eur J Public Health* 2020;31(1):161-166. Available from: <https://academic.oup.com/eurpub/advance-article/doi/10.1093/eurpub/ckaa159/5882018>
15. Rocha MS, Longo PL, Montiel JM. Utilização de smartphones por idosos durante o distanciamento físico causado pelo covid-19. *Tecnologias em projeção* 2021;12(1):9–17.
16. Chaabene H, Prieske O, Herz M, Moran J, Höhne J, Kliegl R, et al. Home-based exercise programmes improve physical fitness of healthy older adults: A PRISMA-compliant systematic review and meta-analysis with relevance for COVID-19. *Ageing Research Reviews*. 2021;67:101265. Available from: <http://doi.org/10.1016/j.arr.2021.101265>.
17. Liu-Ambrose T, Davis JC, Best JR, Dian L, Madden K, Cook W, Hsu CL, Khan KM. Effect of a Home-Based Exercise Program on Subsequent Falls Among Community-Dwelling High-Risk Older Adults After a Fall: A Randomized Clinical Trial. *JAMA*. 2019;321(21):2092-2100. Available from: [10.1001/jama.2019.5795](https://doi.org/10.1001/jama.2019.5795). Erratum in: *JAMA*. 2019 Jul 9;322(2):174. PMID: 31162569; PMCID: PMC6549299.
18. Izquierdo M, Casas-Herrero A, Zambom-Ferraresi F, Martínez-Velilla N, Alonso-Bouzon C, Rodríguez-Mañas L. *ViviFrail - A Practical Guide for Prescribing a Multi-Component Physical Training Program to prevent weakness and falls in People over*. ResearchGate. 2016 [Posted in 2016, Dec.; Accessed 2020 Aug. 20]. 70 p. 66.
19. World Medical Association. Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects. WMA; 2018. Available from: <https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/>
20. Izquierdo M, Casas-Herrero A, Martínez-Velilla N, Alonso-Bouzon C, Rodríguez-Manas L. Un ejemplo de cooperación para la implementación de programas relacionados con el desarrollo de ejercicio en ancianos frágiles: programa europeo Erasmus + «Vivifrail». *Rev Esp Geriatr Gerontol* 2017;52(2):110–1. Available from: <https://www.elsevier.es/en-revista-revista-espanola-geriatria-gerontologia-124-articulo-un-ejemplo-cooperacion-implementacion-programas-S0211139X1630004X>.
21. González V, Lorig K, Holman H, Sobel D, Laurent D, Minor M. Assumindo o Controle de sua Saúde: autocuidado de doenças cardíacas, artrose, diabetes, depressão, asma, bronquite, enfisema e outras condições físicas e mentais. 4º. Porto Alegre: ediPUCRS; 2017. Cap 7. Exercício para flexibilidade, força e equilíbrio: facilitando a vida ;p.412 .
22. Rego Monteiro H, Monteiro GTR, Arica J. Confiabilidade em Questionários para Qualidade: Um Estudo com o Coeficiente Alfa de Cronbach. *Produto & Produção* 2010;11(2):85–103. Available from: <https://seer.ufrgs.br/index.php/ProdutoProducao/article/viewFile/9321/8252>

23. Freitas ALP, Rodrigues SG. A avaliação da confiabilidade de questionários: uma análise utilizando o coeficiente alfa de Cronbach. ResearchGate. 2005 [Posted in 2005; Accessed 2020 Aug. 20]. 16 p. 1-12 Available from: https://www.researchgate.net/publication/236036099_A_avaliacao_da_confiabilidade_de_questionarios_uma_analise_utilizando_o_coeficiente_alfa_de_Cronbach.
24. Costa MES, Braga LC, Cardoso LR, Mokfa GV, Santos FR dos. Principais fatores assinalados por pacientes hipertensos para não adesão ao tratamento e controle da pressão arterial. *SciGen* 2022;3(1):206-14. Available from: <http://scientiageneralis.com.br/index.php/SG/article/view/390>
25. Lopes MA, Krug RDR, Bonetti A, Mazo GZ. Barreiras que influenciaram a não adoção de atividade física por longevas. *Revista Brasileira de Ciências do Esporte*. 2016;38(1):76–83.
26. Wilcox S, Tudor-Locke CE, Ainsworth B. Physical activity patterns, assessment, and motivation in older adults. *Physical Activity and Aging ResearchGate*. 2001 [Posted in ago 2001; Accessed 2020 Aug. 20]. 13-39 Available from: <https://asu.pure.elsevier.com/en/publications/physical-activity-patterns-assessment-and-motivation-in-older-adu>
27. Schuch FB, Bulzing RA, Meyer J, López-Sánchez GF, Grabovac I, Willeit P, et al. Moderate to vigorous physical activity and sedentary behavior change in self-isolating adults during the COVID-19 pandemic in Brazil: A cross-sectional survey exploring correlates. *medRxiv* 2020;1–21. Available from: <https://doi.org/10.1101/2020.07.15.20154559>
28. Flegal KE, Kishiyama S, Zajdel D, Haas M, Oken BS. Adherence to yoga and exercise interventions in a 6-month clinical trial. *BMC Complement Altern Med* 2007;9(7):37. Available from: <https://doi.org/10.1186/1472-6882-7-37>.
29. Rivera-Torres S, Fahey TD, Rivera MA. Adherence to Exercise Programs in Older Adults: Informative Report. *Gerontol Geriatr Med* 2019;5:233372141882360. Available from: <https://doi.org/10.1177/2333721418823604>
30. Machado CLF, Pinto RS, Brusco CM, Cadore EL, Radaelli R. COVID-19 pandemic is an urgent time for older people to practice resistance exercise at home. *Exp Gerontol*. 2020;141:111101. Available from: <https://doi/10.1016/j.exger.2020.111101>.
31. Paulino AC, Vendruscolo R. Vó, sai do celular! Um relato da proposta de aulas remotas de educação física idosos durante a pandemia. *Cadernos de Formação RBCE*. 2021;12(1):102–17. Available from: <https://doi/10.1016/j.exger.2020.111101>
32. Bower KJ, Louie J, Landesrocha Y et al. Clinical feasibility of interactive motion-controlled games for stroke rehabilitation. *J NeuroEngineering Rehabil* 2015;12 (63) Available in: <https://doi.org/10.1186/s12984-015-0057-x>
33. Bacha JMR, Gomes GCV, de Freitas TB, Viveiro LAP, da Silva KG, Bueno GC, et al. Effects of Kinect Adventures Games Versus Conventional Physical Therapy on Postural Control in Elderly People: A Randomized Controlled Trial. *Games Health* 2018;7(1):24-36. Available from: <https://doi/10.1089/g4h.2017.0065>.
34. Kis O, Buch A, Stern N, Moran DS. Minimally supervised home-based resistance training and muscle function in older adults: A meta-analysis. *Arch Gerontol Geriatr*. 2019 Sep 1;84:103909.



Preventive behavior against covid-19 and its relationship with the social and health conditions of older adults

Isabella Risi Dias¹ Vitória Rocha Janhaque¹ Vanessa Aparecida Vilas-Boas² Suzimar de Fatima Benato Fusco³ Daniella Pires Nunes³

Abstract

Objective: To delineate the profile of preventive behavior against covid-19 adopted by older adults and investigate its correlation with social and health conditions. **Method:** A cross-sectional and analytical study conducted with 72 individuals (≥ 60 years) enrolled in an Open University for Older Adults in the municipality of Campinas, São Paulo, Brazil. Participants were contacted via telephone from November 2020 to June 2021. A total of 11 preventive measures were scrutinized to identify the behaviors adopted by older adults against covid-19. Data analysis employed principal component analysis, Pearson's chi-square tests, and Fisher's exact tests, with a confidence level of 95%. **Results:** The adoption of preventive behaviors was assessed through activities such as hand hygiene with soap and water, use of hand sanitizer, wearing facial masks, and practicing social distancing. The majority of individuals reported the adoption of preventive behaviors (79.2%), and it was observed that those with incomes below four minimum wages exhibited higher proportions of compliance (87.5%) compared to individuals with incomes exceeding 10 minimum wages (46.2%) ($p=0.038$). **Conclusion:** Preventive measures against covid-19 were embraced by the older adults, influenced by income. The findings underscore the significance of educational strategies for fostering health preventive behaviors, taking into account the social context.

Keywords: Aged.
Coronavirus Infections.
Health Behavior.

¹ Universidade Estadual de Campinas, Faculdade de Enfermagem. Campinas, SP, Brasil.

² Universidade Estadual de Campinas, Faculdade de Enfermagem, Área de Fundamentos de Enfermagem. Campinas, SP, Brasil.

³ Universidade Estadual de Campinas, Faculdade de Enfermagem, Área de Enfermagem Médico-Cirúrgica. Campinas, SP, Brasil.

Funding: Fundo de Apoio ao Ensino, Pesquisa e Extensão (FAEPEX) da Unicamp e Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).

The authors declare that there is no conflict in the conception of this work.

Correspondence
Isabella Risi Dias
i245291@dac.unicamp.br

Received: 5 April, 2023
Approved: 31 October, 2023

INTRODUCTION

Coronavirus Disease (covid-19) affects the respiratory system, leading to severe acute respiratory syndrome (SARS). The epicenter of this disease was the capital Wuhan in the Hubei province of China, which reported cases since December 2019, attempting to contain the pathogenesis¹. However, covid-19 rapidly spread worldwide and was declared a pandemic by the World Health Organization (WHO) on March 11, 2020².

In Brazil, as of September 8, 2023, the cumulative number of infected individuals was 37,783,855, with 705,172 reported deaths³. Notably, among the fatalities, there is a higher prevalence among older adults, classified as a high-risk group. This demographic exhibit increased vulnerability due to immunosenescence and the presence of multiple chronic conditions such as hypertension, cardiovascular diseases, and chronic respiratory illnesses, which exacerbate the severity of covid-19⁴.

In this context, the adoption of preventive measures has become paramount, including hand hygiene, the use of hand sanitizer, wearing facial masks, practicing social distancing, and avoiding gatherings in public places or home events, with the purpose of mitigating the spread of covid-19. These measures remained crucial until the disease was brought under control, especially prior to the widespread implementation of vaccination⁴.

All these precautions are deemed significant given the coronavirus's high propensity for mutations, leading to the emergence of new strains with varying degrees of virulence, potentially increasing the proportion of severe or lethal cases⁴. Furthermore, akin to the Influenza virus, it is believed that SARS-CoV-2 will persist within the population, causing sporadic outbreaks, possibly during seasonal periods⁵.

The adoption of new behaviors takes into consideration the cultural context and individual characteristics that are intertwined with a specific community⁶. Studies have indicated a high adherence to preventive behaviors among the older population^{7,8}. This adherence can be attributed to a preventive attitude stemming from the susceptibility and severity of the disease, as well as the influence

of family, friends, and media⁹⁻¹¹. Other conditions may indirectly influence health behavior adoption, including demographic, psychosocial, and structural factors¹¹. One study demonstrated a greater adoption of preventive measures in older women with higher levels of education compared to men¹². Additionally, a correlation was found between the fear of acquiring the pathogen and an increase in protective behaviors, particularly among older individuals with multimorbidity^{12,13}.

Given that the adoption of preventive measures against the virus spread is influenced by individual, familial, and social contexts, this study focused on investigating older adults participating in the Open University Program for the Older Adults (OUPOA). This cohort was selected as the research subject owing to their active social engagement, which implies a higher likelihood of embracing preventive behaviors.

This study will be pertinent to understanding the adoption of health behaviors among older adults and will also guide healthcare professionals in formulating effective educational strategies for enhanced adherence to health behaviors, demystifying beliefs and misconceptions regarding covid-19 protection measures.

Thus, the aim of this study was to delineate the profile of preventive behavior against covid-19 adopted by older adults and examine its correlation with social and health conditions.

METHOD

This is a cross-sectional and analytical study conducted with participants from an OUPOA in Campinas (SP). The OUPOA is a social program aimed at providing individuals (aged >50 years) from the university and municipal community with retirement preparation through the biannual provision of workshops, experiences, and lectures. The selection of this group is justified by their engagement in activities fostering health knowledge, the expansion of social connections for an improved quality of life, and the redefinition of the role of older adults in the community.

For sample size calculation, the G*Power 3.1.9.2 software was employed, assuming a significance level of 5%, test power of 80%, effect size of 0.15, and a 20% increment to account for potential losses, resulting in a minimum number of 66 participants. The inclusion criterion was an age equal to or greater than 60 years. Older adults who could not be reached by phone after three attempts on different days and times were excluded.

Data collection occurred through telephone calls between November 2020 and June 2021. A questionnaire comprising inquiries about demographic and socioeconomic aspects, health conditions, and topics related to covid-19 was administered during these calls. Trained interviewers conducted the interviews, which ranged in duration from 30 to 60 minutes.

During the data collection period, individuals were in social isolation, although there had been relaxations regarding the movement of people and businesses, as well as the commencement of covid-19 vaccination in January 2021¹⁴.

The evaluated preventive measures against covid-19 included handwashing, avoiding social gatherings, wearing a facial mask, practicing social distancing, using hand sanitizer, avoiding supermarkets/pharmacies, practicing cough etiquette, exercising, avoiding going out/walking, coughing using a tissue, and wearing gloves. Each measure was described in terms of frequency (most of the time, sometimes, rarely, and never). Adoption of each measure was considered when the response was "most of the time," and non-adoption when responses were "sometimes," "rarely," or "never." Other variables in the study included:

- Sociodemographic characteristics: gender (female; male), age (<70 years; ≥70 years), living alone (yes; no), income (<4 minimum wages; 4 to 10 minimum wages; >10 minimum wages), education (≤12 years; >12 years);
- Health conditions: multimorbidity (reporting two or more diseases: hypertension, asthma, bronchitis or emphysema, diabetes, cardiovascular diseases, stroke, osteoporosis, musculoskeletal diseases, cancer, psychiatric disorders); polypharmacy (the

use of five or more continuously used medications - yes; no) and self-reported fear and anxiety;

- covid-19 topics: exposure to covid-19 (suspected or confirmed case) and sources of information about the disease.

The data were entered into a virtual platform and analyzed using Stata software version 17.0 (StataCorp, College Station, United States; serial number 401706357306). The preventive behaviors for covid-19 were subjected to a principal component analysis to explore interdependence in multivariate data.

The Kaiser criterion was employed to determine the number of factors to be extracted, involving the selection of components with eigenvalues exceeding 1.00. To identify preventive behaviors, components with a factor loading greater than one and their explanatory variance were considered. Following component selection, only variables with factor loadings absolute values greater than 0.25 were included.

To test the association between covid-19 protection behaviors and social and health conditions, the Pearson chi-square test and Fisher's exact test were employed at a significance level of 5%.

The project obtained approval from the Ethics Committee, and ethical principles were followed in accordance with Resolution number 520/2016, as per opinion number 4,152,788/2020. All participants provided verbal authorization to participate in the study, thus confirming the Informed Consent Form¹⁵.

DATA AVAILABILITY

The entire dataset supporting the results of this study is available upon request to the corresponding author, Isabella Risi Dias.

RESULTS

A total of 72 participants were assessed, with the most widely implemented preventive

measures against covid-19 being handwashing (97.2%) and avoiding social gatherings (97.1%) (Figure 1).

The Table 1 indicates the eigenvalues, the percentage of variance that each of the components represents, and the cumulative of these percentages.

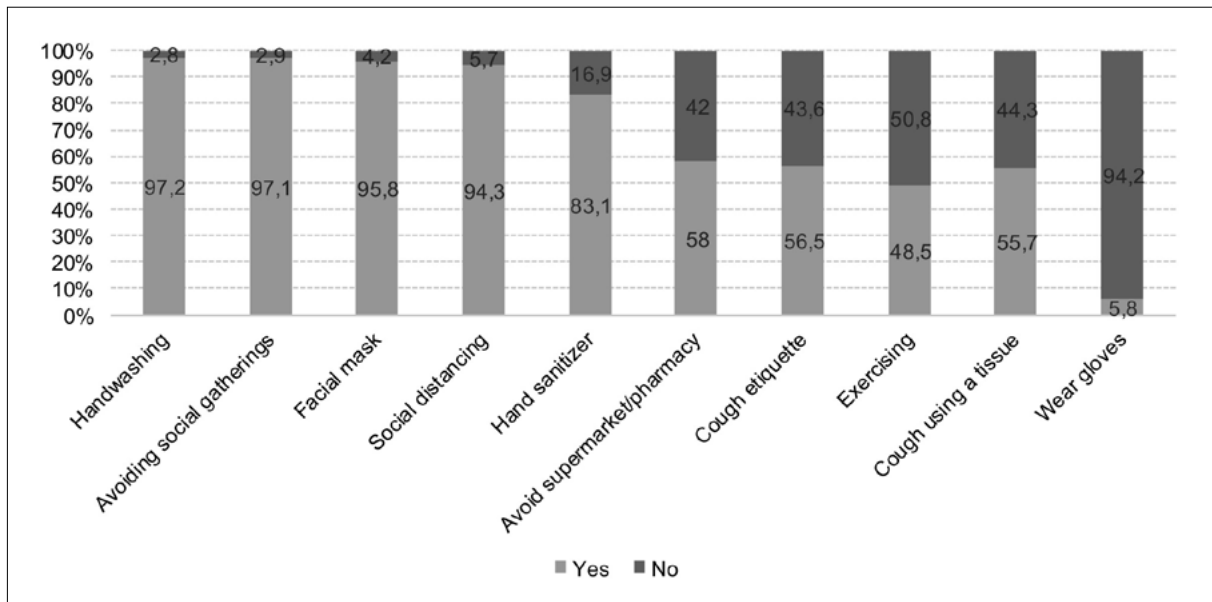


Figure 1. Distribution (%) of older adults according to the adoption of preventive measures (n=72). Campinas, São Paulo, 2020-2021.

Source: Authors. (2022).

Table 1. Eigenvalues and percentages of explained variance for the principal components (n=72). Campinas, São Paulo, 2020-2021.

Components	Eigenvalues	% Variance	% Cumulative
1	3.02	27.48	27.48
2	1.39	12.66	40.14
3	1.34	12.16	52.30
4	1,08	9.91	62.20
5	1.04	9.48	71.68
6	0.82	7.51	79.19
7	0.78	7.12	86.31
8	0.69	6.24	92.55
9	0.56	5.11	97.66
10	0.19	1.75	99.41
11	0.06	0.59	100.00

Source: Authors (2022).

Five components were considered for extraction due to their eigenvalues surpassing one. For each component, variables with factor loadings exceeding an absolute value of 0.25 were selected (Table 2). Subsequently, the following components were acknowledged:

- Component 1: Comprised five preventive behaviors, including handwashing, the use of hand sanitizer, facial mask usage, avoiding social gatherings and adherence to social distancing.
- Component 2: Encompassed the following preventive behaviors: handwashing, hand sanitizer use, facial mask usage, and avoiding social gatherings.
- Component 3: Enveloped four behaviors, namely handwashing, wear gloves, cough etiquette, and avoiding of supermarkets/ pharmacies.
- Component 4: Involved the following behaviors: hand sanitizer use, coughing using a tissue, wear gloves, promoting social distancing, avoiding going out, and engaging in walking.

- Component 5: Constituted by behaviors such as hand sanitizer use, coughing using a tissue, wear gloves, and advocating for social distancing.

Due to its variance, component 1 was selected for the analysis of adherence to preventive measures. Therefore, older adults who reported frequently engaging in behaviors such as handwashing, using hand sanitizer, wearing a facial mask, avoiding social gatherings, and practicing social distancing were considered to have exhibited preventive behaviors against covid-19, totaling 79.2% of the sample (Table 3).

The majority of participants were female (81.9%), aged between 60 and 69 years (66.7%), with an education level equal to or higher than 12 years (80.9%), and an income of less than or equal to 10 minimum wages (80.9%). Regarding health, 50% of older adults reported having multimorbidity, and 18.1% mentioned the use of polypharmacy. There was a significant relationship between income and preventive behavior against covid-19 ($p=0.038$). Older adults with an income below four minimum wages showed higher proportions of preventive behavior (87.5%) compared to individuals with an income exceeding 10 minimum wages (46.2%) (Table 3).

Table 2. Factor loadings, adequacy measure, and uniqueness of preventive behaviors against covid-19. Campinas, São Paulo, 2020-2021 (n=72).

Preventive behaviors against covid-19	Factor loadings of preventive measures in each component					KMO per variable	Uniqueness measure
	1	2	3	4	5		
Handwashing	0.27	0.48	-0.31	0.08	-0.07	0.35	0.32
Hand sanitizer	0.28	-0.32	-0.15	0.38	0.35	0.34	0.30
Facial mask	0.42	-0.36	-0.03	0.12	-0.03	0.49	0.28
Cough etiquette	0.25	-0.06	0.42	0.21	0.12	0.59	0.50
Coughing using a tissue	0.04	0.40	0.25	-0.44	0.43	0.56	0.28
Wear gloves	0.05	0.18	0.36	0.28	-0.71	0.30	0.15
Avoiding social gatherings	0.52	0.26	-0.15	-0.16	-0.17	0.53	0.08
Social distancing	0.50	0.11	-0.23	-0.27	0.35	0.63	0.09
Avoid going out/ walking	0.16	0.06	0.30	0.46	-0.07	0.52	0.37
Avoid supermarkets/ pharmacies	0.24	0.06	0.53	-0.23	-0.01	0.60	0.37
Exercising	0.08	-0.22	0.24	-0.19	-0.08	0.60	0.36

Source: Authors (2022). * Kaiser-Meyer-Olkin (KMO) global test =0.51.

Table 3. Distribution (%) of older adults according to sociodemographic characteristics, health-related factors, topics related to covid-19, and adoption of preventive behavior during the pandemic (n=72). Campinas, São Paulo, 2020-2021.

Characteristics	Total n (%)	Preventive behavior		p-value
		Yes n(%)	No n(%)	
Gender				0.330
Female	59 (81.9)	48 (81.4)	11 (18.6)	
Male	13 (18.1)	9 (69.2)	4 (30.8)	
Age				0.218
< 70 years	48 (66.7)	40 (83.3)	8 (16.7)	
≥ 70 years	24 (33.3)	17 (70.8)	7 (29.2)	
Family structure				0.822
Single-person	27 (37.5)	21 (77.8)	6 (22.2)	
Multiperson	45 (62.5)	36 (80.0)	9 (20.0)	
Education (n=68)				0.400
≤ 12 years	13 (19.1)	9 (69.2)	4 (30.8)	
> 12 years	55 (80.9)	44 (80)	11 (20)	
Income (n=68)				0.038
< 4 minimum wages	24 (35.3)	21 (87.5)	3 (12.5)	
4 a 10 minimum wages	31 (45.6)	26 (83.9)	5 (16.1)	
>10 minimum wages	13 (19.1)	7 (46.2)	7 (53.8)	
Multimorbidity				0.772
Yes	36 (50.0)	28 (77.8)	8 (22.2)	
No	36 (50.0)	29 (80.6)	7 (19.4)	
Polypharmacy				0.330
Yes	13 (18.1)	9 (69.2)	4 (30.8)	
No	59 (81.9)	48 (81.4)	11 (18.6)	
Anxiety (n=71)				0.257
Yes	35 (49.3)	30 (85.7)	5 (14.3)	
No	36 (50.7)	27 (75)	9 (25.0)	
Fear of covid-19 (n=71)				0.840
Yes	62 (87.3)	50 (80.7)	12 (19.3)	
No	9 (12.7)	7 (77.8)	2 (22.20)	
Total		57 (79.2)	15 (20.8)	

Source: Authors (2022).

DISCUSSION

This study aimed to establish connections between social and health characteristics, as well as preventive behaviors against covid-19, among participants in an Open University Program for the Older Adults (OUPOA). It is noteworthy that the majority of the

older adults were female, in their sixties, with a high level of education and an income ranging from four to 10 minimum wages. This predominantly female profile aligns with other studies, emphasizing the feminization of old age and an increasing focus on this segment that ages differently in both biological and psychosocial aspects¹⁶⁻¹⁸.

Regarding education and income, the results presented diverge from those presented by the ELSI initiative, which encompasses a sample of older adults from the Brazilian population. Probably, because the older adults participating in the OUPOA program are likely to have higher education and incentives to engage in lifelong learning initiatives^{11,13, 19, 20}.

Concerning health conditions, the majority of participants exhibited multimorbidity and fear of covid-19. These topics were prevalent in this population due to the perceived susceptibility to contracting the disease caused by the immunosenescence process^{7,8}.

Additionally, there is the challenge of obtaining information and evidence regarding covid-19, particularly in the early stages of the pandemic¹². Nevertheless, the OUPOA contribute to the maintenance of social participation among the older adult, potentially fostering a positive perception of well-being and health. Such initiatives also assist in building support networks and promoting individual integration, facilitating the adoption of preventive health behaviors^{21,22}. Amid the covid-19 pandemic, the University established a support network for the older adult through telephone calls, enabling them to share their concerns and maintain an active support system. This program proved essential for health promotion and the strengthening of bonds with the older adult during the covid-19 period²³.

In this study, the adoption of preventive behaviors was assessed through the reporting of care practices such as handwashing, avoiding social gatherings, wearing facial masks, practicing social distancing, and utilizing hand sanitizer. The modes of coronavirus transmission include person-to-person through infected droplets, saliva, or aerosols, as well as via contact with objects and surfaces contaminated with the virus²⁴. Handwashing with soap and water, along with the use of hand sanitizer, are indispensable measures, as they not only prevent environmental contamination in case an individual is infected but also serve to prevent infection when coming into indirect contact with secretions/aerosols²⁵. This strategy is easily comprehensible, has been extensively covered in major media outlets, and encourages the utilization of basic hygiene resources such as soap and water for its implementation.

Regarding the use of face masks, numerous studies have addressed their efficacy as a barrier method that prevents and reduces the dispersion of the virus in the environment, consequently lowering the incidence of cases in a pandemic and emergency situation. With the onset of the disease, there was an intense global demand for masks. In this context, in addition to surgical masks, cloth masks also emerged, varying in the number of layers. These had a direct impact on viral transmission, effectively slowing its dissemination^{26,27}.

Another effective measure, social distancing, ensured greater isolation among people by creating physical barriers or establishing significant safety distances, thus mitigating virus transmission²⁷. In Brazil, since the onset of covid-19, various forms of isolation have been implemented, ranging from the suspension of events and restrictions on public spaces to population-wide quarantine (lockdown). This isolation must be long enough to guarantee the desired epidemiological effect; the early adoption of distancing measures can lead to a relaxation that allows for new waves of infection, as observed in Brazil^{1,28}. A study conducted in the United States showed that 62.2% of the sample used facial masks, and 87.7% avoided large gatherings²⁴. Conversely, in Hong Kong, China, 94.2% used facial masks^{1,29}.

These elevated adherence rates may indicate that the perception of the disease, based on knowledge and beliefs about it, as well as cultural and individual characteristics influencing the adoption or non-adoption of protective behaviors, alters preventive behaviors in general across all age groups^{7,24}.

Vaccination was not assessed as it was approved in the country after the commencement of this study. Several vaccines were developed during the pandemic, proving to be an effective preventive measure against coronavirus infection. Mass vaccination of the population establishes herd immunity and contains the spread of the pathogen³⁰.

The engagement of older individuals in preventive behaviors can be triggered by a complex combination of constructs such as barriers, social contexts, scientific dissemination, and personal perceptions/beliefs^{4,7,19,29}. The adoption of preventive behaviors related to covid-19 was approximately

80% in this study. Studies indicate that compliance with preventive behaviors is associated with the perception of susceptibility to contracting covid-19 and its severity^{7,8,22,31,32}.

A study conducted in Singapore, aiming to analyze the relationship between sociodemographic data and preventive behaviors, included a sample of 953 individuals, with 65.1% being female, 8.1% aged 60 or older. Approximately 97% adopted at least one preventive measure, with around 95% of women frequently washing their hands, while about 80% of men did the same³³. In Hong Kong, China, a study evaluated the community's efforts to adopt preventive behaviors in a sample of 765 individuals, where 18.7% were over 65 years old. Results showed that 97.4% used face masks, and 80.4% avoiding social gatherings²⁹.

The perception of severity was high among older individuals, as they recognize their immune system as more compromised and the risks associated with age-related comorbidities, leading them to adopt preventive measures more actively⁸. Noteworthy among the participants is the reported high level of education. It is known that individuals with higher educational attainment tend to exhibit greater adherence to preventive behaviors³⁴. This phenomenon can be justified by their access to and understanding of information about the disease and its severity, motivating the utilization of preventive measures for self-protection²⁹.

In this study, a significant relationship was found between income and preventive behavior against covid-19. Individuals with an income exceeding 10 minimum wages adopted fewer preventive behaviors (46.2%) compared to those with lower income. This finding is similar to a Chinese study that identified a significant interaction between average versus below-average family income and precautionary behaviors. The study observed that lower income was associated with higher adoption, as individuals had less information and more fear of contracting the disease⁹. Another hypothesis for this finding may be linked to the fact that older adults with higher incomes did not need to expose themselves by leaving home for work or travel, resulting in less use of personal protective equipment.

Among the limitations of this study is the fact that the data were self-reported, allowing for potential manipulation by the participants. During the pandemic, some studies acknowledged self-reported accounts of adopting preventive behaviors as a limitation, as individuals tend to conform to socially acceptable behavioral norms, potentially overestimating the adoption of preventive measures^{33,35}.

However, it is important to note that the participants in this study are individuals with higher education and income who attend a university. Consequently, they may have easier access to information about covid-19 and non-pharmacological behaviors to be adopted during this period. Additionally, the sample was specific to an OUPOA, which prevents the extrapolation of study findings to the older population in the municipality of Campinas. Further studies with probabilistic sampling are necessary to provide more generalizable insights.

CONCLUSION

The results of this study revealed that the older participants from the OUPOA adhered to preventive measures for covid-19. The majority reported engaging in behaviors such as hand hygiene with soap and water or hand sanitizer, wearing facial masks, practicing social distancing, and avoiding social gatherings.

Another noteworthy finding was the significant association between income and the adoption of these preventive behaviors. Individuals with incomes below four minimum wages showed higher proportions of adopting preventive measures, indicating that socioeconomic factors play a crucial role in adherence to these practices.

In light of the understanding that promoting preventive health behaviors depends not only on individual choices and characteristics but also on the social context in which these individuals are situated, this study reinforced that programs like this serve as potent social instruments for the socialization of older individuals, as well as for the dissemination of knowledge. Furthermore, it emphasizes the importance of directing educational and awareness

efforts toward higher-income groups, which may be less inclined to adhere to preventive measures.

Therefore, further research endeavors may prove crucial in seeking a heightened understanding of the factors influencing preventive behavior across diverse social and demographic groups. These studies can play a pivotal role in guiding public health strategies and educational initiatives for covid-19 prevention among the older population.

AUTHORSHIP

- Isabella R. Dias - Paper writing; critical review; data analysis and interpretation; approval of the version to be published; responsibility for all aspects of the manuscript, ensuring issues related to the accuracy or integrity of any part of the work.

- Vitória R. Janhaque - Critical review; data design; approval of the version to be published.
- Vanessa Aparecida Vilas-Boas – Paper writing; critical review; approval of the version to be published.
- Suzimar de Fatima Benato Fusco - Paper writing; critical review; approval of the version to be published.
- Daniella P. Nunes - Paper writing; critical review; conception, design, analysis and interpretation of data; approval of the version to be published; responsibility for all aspects of the manuscript, ensuring issues related to the accuracy or integrity of any part of the work.

Edited by: Yan Nogueira Leite de Freitas

REFERENCES




1. Kumar A, Singh R, Kaur J, Pandey S, Sharma V, Thakur L, et al. Wuhan to world: the covid-19 pandemic. *Front Cell Infect Microbiol.* 2021 Mar 30; 11:596201. Available at: <https://doi.org/10.3389/fcimb.2021.596201>.
2. Organização Pan-Americana de Saúde. Folha informativa sobre covid-19 [Internet]. 2020 [access: March 3, 2023]. Available at: <https://www.paho.org/pt/covid19>
3. Brasil. Ministério da Saúde. Painel coronavírus [Internet]. Brasília, DF: Ministério da Saúde; 2020 [access: September 9, 2023]. Available at: <https://covid.saude.gov.br/>
4. Nunes BP, Souza ASS, Nogueira J, Andrade FB, Thumé E, Teixeira DSC, et al. Multimorbidade e população em risco para covid-19 grave no estudo longitudinal da saúde dos idosos brasileiros. *Cad Saúde Pública.* 2020; 36(12):e00129620. Available at: <https://doi.org/10.1590/0102-311x00129620>.
5. Monto AS. The future of SARS-CoV-2 vaccination: lessons from Influenza. *N Engl J Med.* 2021 Nov 11; 385(20):1825-27. Available at: <https://doi.org/10.1056/NEJMp2113403>.
6. Voloch CM, Francisco Junior RS, Almeida LGP, Cardoso CC, Brustolini OB, Gerber AL at al. Genomic characterization of a novel SARS-CoV-2 lineage from Rio de Janeiro. *J Virol.* 2021; 95(10):e00119-21. Available at: <https://doi.org/10.1128/JVI.00119-21>.
7. Fujii R, Suzuki K, Niimi J. Public perceptions, individual characteristics, and preventive behaviors for covid-19 in six countries: a cross-sectional study. *Environ Health Prev Med.* 2021 Mar 3; 26(1):29. Available at: <https://doi.org/10.1186/s12199-021-00952-2>.
8. Luo Y, Cheng Y, Sui M. The moderating effects of perceived severity on the generational gap in preventive behaviors during the covid-19 pandemic in the US. *Int. J. Environ Res Public Health.* 2021 Feb 19;18(4):2011. Available at: <https://doi.org/10.3390/ijerph18042011>.
9. Carvalho KM, Silva CRDT, Felipe SGB, Gouveia MTO. A crença em saúde na adoção de medidas de prevenção e controle da covid-19. *Ver Bras Enferm.* 2021; 74(Suppl.1):e20200576. Available at: <https://doi.org/10.1590/0034-7167-2020-0576>.
10. Liang W, Duan Y, Shang B, Hu C, Baker JS, Lin Z, et al. Precautionary behavior and depression in older adults during the covid-19 pandemic: an online cross-sectional study in Hubei, China. *Int J Environ Res Public Health.* 2021;18(4):1853. Available at: <https://doi.org/10.3390/ijerph18041853>.
11. Lima-Costa MF, Mambrini JVM, Andrade FB, Peixoto SWV, Macinko J. Distanciamento social, uso de máscaras e higienização das mãos entre participantes do estudo longitudinal da saúde dos idosos brasileiros: iniciativa ELSI-covid-19. *Cad Saúde Pública.* 2020; 36:3. Available at: <https://doi.org/10.1590/0102-311X00193920>.

12. Kohler H, Bäuerle A, Schweda A, Weismüller B, Fink M, Musche V, et al. Increased covid-19-related fear and subjective risk perception regarding covid-19 affects behavior in individuals with internal high-risk diseases. *J Prim Care Community Health*. 2021; 12:2150132721996898. Available at: <https://doi.org/10.1177/2150132721996898>.
13. Batista SR, Souza ASS, Nogueira J, Andrade FB, Thumé E, Teixeira DSC, et al. Comportamentos de proteção contra covid-19 entre adultos e idosos brasileiros que vivem com multimorbidade: iniciativa ELSI-covid-19. *Cad Saúde Pública*. 2020; 36(Suppl.3):e00196120. Available at: <https://doi.org/10.1590/0102-311x00196120>.
14. Brasil. Ministério da Saúde. Conselho Nacional de Saúde. Recomendação n.º 003, de 03 março de 2021 [Internet]. 2021 [access: March 1, 2023]. Available at: <https://conselho.saude.gov.br/recomendacoes-cns/recomendacoes-2021/1633-recomendacao-n-003-de-03-de-marco-de-2021>.
15. Brasil. Ministério da Saúde. Conselho Nacional de Saúde. Resolução n.º 510, de 7 de abril de 2016. *Diário Oficial da União, Brasília, DF, 24 mai. 2016. n.98, seção 1, p.44*.
16. Almeida AV, Tavares Mafra SC, da Silva EP, Kanso S. A feminização da velhice: em foco as características socioeconômicas, pessoais e familiares das idosas e o risco social. *Textos Contextos*. 2015; 14(1):115-31. Available at: <https://doi.org/10.15448/1677-9509.2015.1.19830>.
17. Brasil. Ministério da Mulher, da Família e dos Direitos Humanos. Secretaria Nacional da Família. Fatos e números: idosos e família no Brasil [Internet]. 2021 [access: January 1, 2023]. Available at: <https://www.gov.br/mdh/pt-br/navegue-por-temas/observatorio-nacional-da-familia/fatos-e-numeros/idosos-e-familia-no-brasil.pdf>.
18. Maximiano-Barreto MA, Andrade L, Campos LB, Portes FA, Generoso FK. A feminização da velhice: uma abordagem psicossocial do fenômeno. *Interfaces Científicas - Humanas e Sociais*. 2019;8(2):239–52. Available at: <https://doi.org/10.17564/2316-3801.2019v8n2p239-252>.
19. Peixoto SV, Souza MAN, Mambrini JVM, Andrade FB, Malta DC, Costa MFL. Comportamentos em saúde e adoção de medidas de proteção individual durante a pandemia do novo coronavírus: iniciativa ELSI-covid-19. *Cad Saúde Pública*. 2020; 36(3):e00195420. Available at: <https://doi.org/10.1590/0102-311X00195420>.
20. Seixas BV, Freitas GR. Polypharmacy among older Brazilians: prevalence, factors associated, and sociodemographic disparities (ELSI-Brazil). *Pharm Pract*. 2021 Mar; 19(1):2168. Available at: <https://doi.org/10.18549/PharmPract.2021.1.2168>.
21. Santos AL, Souza NR, Silveira VFSB, Chaud SG, Piantino CB, Souza LR. Avaliação do perfil sociodemográfico e nutricional na diferença entre homens e mulheres idosos ingressantes no programa Universidade Aberta para a Maturidade. *Rev enferm UFPE*. 2017; 11(Supl. 1):327-33. Available at: <https://doi.org/10.5205/1981-8963-v11i1a11912p327-333-2017>.
22. Hou WK, Lee TM, Liang L, Li TW, Liu H, Tong H, et al. Psychiatric symptoms and behavioral adjustment during the covid-19 pandemic: evidence from two population-representative cohorts. *Transl Psychiatry*. 2021 Nov 6 [access: November 6, 2023]; 11:174. Available at: <https://www.nature.com/articles/s41398-021-01279-w>.
23. Ribeiro AQ, Guimarães MSA, Santos CA, Castro JS, Bretas JM, Guerra DJR et al. Projeto escuta solidária: universidade no apoio às pessoas idosas no contexto da covid-19. *Capim Dourado: Diálogos em Extensão*. 2020; 3(3): 47-57. Available at: <https://doi.org/10.20873/9815-v3n3>.
24. Miller LMS, Gee PM, Katz RA. The importance of understanding covid-19: the role of knowledge in promoting adherence to protective behaviors. *Front Public Health*. 2021 Apr 6; 9:581497. Available at: <https://doi.org/10.3389/fpubh.2021.581497>.
25. World Health Organization. Transmission of SARS-CoV-2: implications for infection prevention precautions: scientific brief, 09 July 2020 [Internet]. 2020 [access: July 25, 2022]. Available at: <https://iris.who.int/handle/10665/333114>.
26. Brooks JT, Beezhold DH, Noti JD, Coyle JP, Derk RC, Blachere FM, et al. Maximizing fit for cloth and medical procedure masks to improve performance and reduce SARS-CoV-2 transmission and exposure, 2021. *MMWR Morb Mortal Wkly Rep*. 2021 Feb 19; 70:254-57. Available at: <https://doi.org/10.15585/mmwr.mm7007e1>.
27. Cavalcante JR, Santos ACC, Bremm JM, Lobo AP, Macário EM, Oliveira WK, et al. covid-19 no Brasil: evolução da epidemia até a semana epidemiológica 20 de 2020. *Epidemiol Serv Saúde*. 2020; 29(4):e2020376. Available at: <https://doi.org/10.5123/S1679-49742020000400010>.

28. Person OC, Almeida PRL, Puga MES, Atallah AN. O que se sabe sobre a eficácia do distanciamento social, lockdown e uso de máscaras faciais para covid-19? Scoping review. *Diagn Tratamento*. 2021; 26(3):130-6. Available at: https://www.apm.org.br/wp-content/uploads/RDT_v26n3_compressed.pdf.
29. Chan EYY, Huang Z, Lo ESK, Hung KKC, Wong ELY, Wong SYS. Sociodemographic predictors of health risk perception, attitude and behavior practices associated with health-emergency disaster risk management for biological hazards: the case of covid-19 pandemic in Hong Kong, SAR China. *Int J Environ Res Public Health*. 2020 May 29; 17(11):3869. Available at: <https://doi.org/10.3390/ijerph17113869>.
30. Silva LSS, Lima AFR, Polli DA, Razia FS, Pavão LFA, Cavalcanti MAFH et al. Medidas de distanciamento social para o enfrentamento da covid-19 no Brasil: caracterização e análise epidemiológica por estado. *Cad Saúde Pública*. 2020; 36(9):e00185020. Available at: <https://doi.org/10.1590/0102-311X00185020>.
31. Sljivo A, Kacamakovic M, Sirucic I, Mujicic E, Dzubur-Kulenovic A. Knowledge, attitudes, and practices towards covid-19 among residents of Bosnia and Herzegovina during the first stage of covid-19 outbreak. *Ann Ig*. 2021 Jul-Aug; 33(4): 371-380. Available at: <https://doi.org/10.7416/ai.2021.2447>.
32. van der Valk JP, Heijboer FW, van Middendorp H, Evers AW, in 't Veen JC. Case-control study of patient characteristics, knowledge of the covid-19 disease, risk behaviour and mental state in patients visiting an emergency room with covid-19 symptoms in the Netherlands. *Plos One*. 2021 Apr 28;16(4):e0249847. Available at: <https://doi.org/10.1371/journal.pone.0249847>.
33. Long VJ, Liu JC. Behavioural changes during the covid-19 pandemic: results of a nationwide survey in Singapore. *Ann Acad Med Singap*. 2021 Mar; 50(3):222-31. Available at: <https://doi.org/10.47102/annals-acadmedsg.2020391>.
34. Xu Y, Lin G, Spada C, Zhao H, Wang S, Chen X, et al. Public knowledge, attitudes, and practices behaviors towards coronavirus disease 2019 (covid-19) during a national epidemic: China. *Front Public Health*. 2021 Mar 19; 9:638430. Available at: <https://doi.org/10.3389/fpubh.2021.638430>.
35. Bruin WB, Carman KG, Parker AM. Mental associations with covid-19 and how they relate with self-reported protective behaviors: a national survey in the United States. *Soc Sci Med*. 2021; 275:113825. Available at: <https://doi.org/10.1016/j.socscimed.2021.113825>.



Health services utilization by older adults in rural and urban areas of Brazil

Gleica Soyan Barbosa Alves¹ 
Rosana Cristina Pereira Parente¹ 
Fernando José Herkrath^{1,2} 

Abstract

Objective: To assess health services utilization by older adults in urban and rural areas of Brazil. **Method:** A cross-sectional study was conducted analyzing data from the 2019 National Health Survey on older adults (≥ 60 years) selected from households based on 22,728 interviews (3,300 in rural and 19,426 in urban areas). For rural and urban areas, the prevalence of Family Health Strategy enrolment, time since last medical and dental visit, service use in past 2 weeks, and last blood pressure and blood glucose measurements were estimated. Also, the factors associated with medical and dental health services utilization in the past 12 months were explored. **Results:** Self-rated health of “Very good” or “Good” was greater in urban areas (47.32%), as was the proportion of older adults reporting a medical or dental visit within the last 12 months (90.54%). Rates of blood pressure (81.30%) and glucose (45.83%) monitoring were lower in rural areas. Older individuals that had low education, resided in rural areas, and the North region, had a lower likelihood of using health services. **Conclusion:** The older population living in rural areas had poorer health status compared with the urban population.

Keywords: Older adult health. Health service utilization. Rural population health. Epidemiological surveys.

¹ Fundação Oswaldo Cruz, Instituto Leônidas e Maria Deane. Manaus, AM, Brasil.

² Universidade do Estado do Amazonas, Escola Superior de Ciências da Saúde. Manaus, AM, Brasil.

There was no funding for the execution of this work.

The authors declare that there is no conflict in the conception of this work.

Correspondence
Gleica Soyan Barbosa Alves
gleica@ufam.edu.br

Received: May 16, 2023
Approved: October 31, 2023

INTRODUCTION

The older population has inherent specificities, such as a higher prevalence of chronic diseases and functional decline, and requires organized care provision that differs to other age groups, placing greater demands on health systems¹⁻³. In response to this need, the National Health Policy for Older Adults (PNSPI)⁴ aims to provide the Brazilian older population with adequate quality health care. Thus, geriatric and gerontology services must address the specific needs of older adults, tailoring care to the peculiarities of this age group and adapting them to the sociocultural context of users.

This older patient group cites distance, waiting times and shortage of places as the main barriers to accessing health services, particularly in rural areas⁵⁻¹². The literature shows that the way people perceive the availability of health services influences decisions on seeking them, where geographical, financial, organizational and cultural barriers, among others, facilitate or obstruct people's ability to utilize health services¹³.

Health inequities in rural and urban populations are a global phenomena^{14,15}. Rural populations exhibit, besides poorer access to health services, albeit medical or dental, poorer living conditions and health status compared to urban populations. Rural communities also have a greater proportion of low-income families, higher illiteracy rates, and a greater incidence of neglected diseases¹⁶⁻¹⁸.

Information on the use of health services by older individuals is important for planning and assessment, helping to inform the reformulation of public policies and actions toward maintaining functional capacity and well-being in later life. In addition, this knowledge can contribute to organizing care for older users which takes account of their needs

and specificities according to the territory in which they reside, albeit urban or rural^{12,19}. These factors warrant the present study investigating general health service utilization by older adults in urban and rural areas of Brazil.

METHOD

A study was conducted which analyzed macrodata from the 2019 National Health Survey (PNS), a cross-sectional population-based national survey carried out by the Brazilian Ministry of Health in collaboration with the Brazilian Institute of Geography and Statistics (IBGE). The PNS is representative of the Brazilian population, macroregions, Federal Units (States), capital cities and their metropolitan regions, and also provides a basis for estimates of urban and rural areas in the country²⁰.

The sampling of the 2019 PNS was performed by conglomerate in three stages: census sectors, permanent private households, and one dweller aged ≥ 15 years randomly selected from each household, while households located in special or sparsely populated census sectors were excluded²⁰. The present study included all dwellers aged ≥ 60 years identified at the third stage of sample selection, based on a total of 22,728 interviews, comprising 3,300 rural residents and 19,426 urban residents.

The variables analyzed included sociodemographic characteristics of the participants: age, sex, race/skin color, literacy and years of formal education successfully completed. With regard to health services use, variables were selected from 3 blocks of questions on the PNS: modules B (Household Visits by Family Health Team and Endemic Agents), J (Health Service Utilization) and Q (Chronic Diseases), as outlined in Chart 1.

Chart 1. Variables used for analysis, extracted from the 2019 National Health Survey (PNS).

Module	Variable	Response options
B – Household Visits by Family Health Team and Endemic Agents	B1. Is your household registered with the Family Health Unit?	1. Yes 2. No 3. Does not know
J - Health Services Utilization	J1 – Overall, how would you rate your health status?	1. Very good 2. Good 3. Fair 4. Poor 5. Very poor
	J11a. When was the last time you saw a doctor?	1. < 1 year ago 2. 1-2 years ago 3. 2-3 years ago 4. >3 years ago 5. Has never been to the doctors
	J13a. When was the last time you saw a dentist?	1. < 1 year ago 2. 1-2 years ago 3. 2-3 years ago 4. >3 years ago 5. Has never been to the dentists
	J14. In the past 2 weeks, have you sought a health unit, service or professional for your own care?	1. Yes 2. No
	J17a. During this first attempt to see a health profession for this problem in the past two weeks:	1. visit was scheduled for another day/place 2. I was not seen. 3. I was seen
Q – Chronic Diseases	Q1a. When was the last time you had your blood pressure taken?	1. <6 months ago 2. 6-12 months ago 3. 1-2 years ago 4. 2-3 years ago 5. > 3 years ago 6. never
	Q29a. When was the last time you had a blood test to measure glucose level, i.e. blood sugar?	1. <6 months ago 2. 6-12 months ago 3. 1-2 years ago 4. 2-3 years ago 5. >3 years ago 6. never

For each variable, mean values or prevalence rates were estimated for rural and urban areas, together with their respective 95% confidence intervals (95%CI), considering the sample design and sample weightings of the survey (*svy* command). The estimates of outcomes for self-rated health and health service use were compared for area of residence using 95%CI. Lastly, logistic regression analyses were performed to assess the association of residence situation with the health services utilization

outcomes medical and dental health care in last 12 months, estimating crude and adjusted odds ratios (OR) for the other covariables. All statistical analyses were carried out using the software package Stata SE, version 17.0, licensed to author Fernando José Herkrath. The level of significance adopted was 0.05.

The 2019 PNS was approved by the National Board of Research Ethics (permit no.3.529.326) and the microdata are available online for public access and use from <https://www.ibge.gov.br/estatisticas/>

sociais/saude/29540-2013-pesquisa-nacional-de-saude.html?pedicao=9177&t=microdados.

DATA AVAILABILITY

The complete dataset underpinning the results of the present study is available upon request from the corresponding author Gleica Soyan Barbosa Alves.

RESULTS

The majority of the older respondents of the 2019 PNS lived in urban areas (85.5%). Most of the rural population lived in the Northeast region,

while the urban population was predominantly in the Southeast. A gender difference for area of residence was identified, with a predominance of males in rural areas and females in urban areas. No age difference for area of residence was evident, where mean age of older respondents was around 70 years. With regard to race/skin color, rural areas had a higher proportion of residents who self-identified as brown, whereas urban areas had a higher proportion of white and yellow individuals. There was also a higher proportion of illiterate individuals in rural areas, while the average number of formal years of education successfully completed was also lower in the rural region. The sociodemographic characteristics of the older population studied according to area of residence are outlined in Table 1.

Table 1. Sociodemographic characteristics of older population interviewed in 2019 PNS, according to area of residence.

Variables	Rural	Urban
Region of residence, % (95%CI)		
North	9.19 (8.42-10.02)	5.56 (5.43-5.69)
Northeast	47.81 (45.98-49.65)	21.56 (21.23-21.89)
Southeast	21.08 (19.32-22.95)	50.75 (50.44-51.07)
South	17.00 (15.67-18.43)	15.52 (15.28-15.75)
Mid-West	4.92 (4.23-5.72)	6.62 (6.49-6.74)
Sex, % (95%CI)		
Male	53.96 (52.07-55.86)	41.51 (41.19-41.83)
Female	46.04 (44.14-47.93)	58.49 (58.17-58.81)
Age, mean (95%CI)	70.28 (69.96-70.62)	69.78 (69.59-69.98)
Race/skin color, % (95%CI)		
White	36.76 (34.73-38.83)	52.85 (51.60-54.09)
Black	10.74 (9.42-12.22)	10.20 (9.47-10.97)
Yellow	0.38 (0.21-0.70)	1.43 (1.14-1.80)
Brown	51.71 (49.43-53.98)	34.96 (33-82-36.11)
Indigenous	0.40 (0.24-0.65)	0.56 (0.42-0.75)
Ignored or not informed	0.01 (0.00-0.06)	-
Can read and write, % (95%CI)		
Yes	57.97 (55.82-60.09)	85.35 (84.46-86.19)
No	42.03 (39.91-44.17)	14.65 (13.81-15.54)
Years of formal education, mean (95%CI)	3.11 (2.97-3.25)	7.31 (7.17-7.45)

95%CI, 95% confidence interval

The variables associated with health services use by the older population are presented in Table 2. The proportion of respondents reporting Very good or Good self-rated health was greater in urban residents (49.1%; 95%CI=47.8-50.4) compared to rural residents (36.6%; 95%CI=34.5-38.8). Similarly, the proportion of respondents that reported a medical and dental visit within the last 12 months was also higher in the urban group. The percentage of respondents that reported never having seen a dentist was 5.8% (95%CI=4.7-7.2) in the rural population compared with 1.4% (95%CI=1.1-1.7) in urban residents. However, among respondents who had sought health care services within the past 2 weeks, 77.1% (95%CI=73.5-80.4) of rural residents were able to see a health professional the same day versus 66.7% (95%CI=64.6-68.8) of urban patients.

Also, rates of blood pressure and blood glucose monitoring proved lower in rural areas. More specifically, 4.1% (95%CI=3.3-4.9) of rural respondents reported having blood pressure measured >3 years

previous or never having measured it, compared with 2.4% (95%CI=2.1-2.8) of urban residents. This disparity was even greater for blood glucose testing, with rates of 17.5% (95%CI=16.0-19.1) in the rural area versus 7.5% (95%CI=6.9-8.1) in the urban area.

The results of logistic regression analyses of factors associated with last medical and dental visits among the older population are presented in Tables 3 and 4, respectively. Residing in a rural area and in the North region, being of male gender, having brown skin, lower educational level and better self-rated health, were factors statistically associated with a lower likelihood of having seen a doctor in the 12 months leading up to interview. The factors significantly associated with lower likelihood of having seen a dentist within this same period were living in a rural area and in the North region (relative to Southeast, South or Mid-West regions), higher age, declaring as black, brown or indigenous, having lower educational level, household registered with the ESF, and not rating overall health as Very Good.

Table 2. Aspects associated with self-rated health and health services use among older adults in Brazil, according to area of residence, 2019.

Variables	Rural % (95%CI)	Urban % (95%CI)
Household registered with ESF		
Yes	78.81 (76.65-80.89)	58.96 (57.33-60.56)
No	13.43 (11.76-15.28)	30.86 (29.38-32.38)
Does not know	7.77 (6.44-9.33)	10.18 (9.40-11.01)
Self-rated health		
Very good	3.65 (3.03-4.38)	8.67 (7.99-9.38)
Good	32.95 (30.93-35.03)	40.45 (39.22-41.68)
Fair	49.03 (46.87-51.18)	40.25 (39.00-41.51)
Poor	12.06 (10.70-13.55)	7.94 (7.36-8.56)
Very poor	2.31 (1.52-3.47)	2.69 (2.28-3.15)
Last medical consultation		
<1 year ago	81.76 (80.20-83.21)	90.54 (89.86-91.18)
1-2 years ago	7.83 (6.96-8.80)	4.93 (4.46-5.43)
2-3 years ago	2.95 (2.36-3.67)	1.40 (1.17-1.67)
> 3 years ago	6.72 (5.74-7.84)	2.95 (2.59-3.34)
Never been to doctor	0.74 (0.50-1.08)	0.18 (0.11-0.26)

to be continued

Continuation of Table 2

Variables	Rural % (95%CI)	Urban % (95%CI)
Last dental consultation		
<1 year ago	19.18 (17.65-20.79)	37.48 (36.15-38.82)
1-2 years ago	9.22 (8.04-10.56)	13.14 (12.37-13.95)
2-3 years ago	6.69 (5.72-7.79)	8.29 (7.65-8.97)
> 3 years ago	59.08 (56.79-61.33)	39.72 (38.39-41.05)
Never been to dentist	5.83 (4.73-7.15)	1.36 (1.11-1.67)
Sought health services in last 2 weeks		
Yes	22.20 (20.38-24.11)	30.64 (29.51-31.77)
No	77.80 (75.88-79.62)	69.36 (68.22-70.48)
Outcome of health care services sought in last 2 weeks		
Scheduled for another date/place	20.89 (17.72-24.45)	30.96 (28.90-33.08)
Was not seen	1.99 (1.18-3.33)	2.31 (1.81-2.93)
Was seen	77.12 (73.48-80.38)	66.73 (64.57-68.82)
Last blood pressure reading		
< 6 months	81.30 (79.54-82.93)	84.69 (83.77-85.55)
6 -12 months	8.62 (7.56-9.80)	8.40 (7.77-9.06)
1-2 years	4.64 (3.89-5.51)	3.54 (3.09-4.04)
2-3 years	1.37 (0.97-1.93)	0.96 (0.72-1.27)
> years	3.20 (2.56-3.98)	1.80 (1.53-2.12)
Never	0.87 (0.54-1.38)	0.62 (0.44-0.87)
Last blood glucose test		
< 6 months	45.83 (43.61-48.06)	61.01 (59.85-62.15)
6 -12 months	18.26 (16.78-19.83)	19.04 (18.12-19.99)
1-2 years	13.38 (12.10-14.76)	9.46 (8.81-10.15)
2-3 years	5.05 (4.22-6.04)	3.03 (2.62-3.50)
>3 years	11.13 (9.99-12.38)	5.68 (5.17-6.22)
Never	6.34 (5.41-7.42)	1.78 (1.46-2.14)

95%CI, 95% confidence interval

Table 3. Factors associated with medical visit within last 12 months among older adults in Brazil, 2019.

Variable	Crude OR (95%CI)	Adjusted OR(95%CI)
Area of household (ref. Urban)		
Rural	0.47 (0.41-0.53) ***	0.61 (0.53-0.70) ***
Region of residence (ref.: North)		
Northeast	1.30 (1.09-1.54) **	1.26 (1.05-1.51) *
Southeast	2.42 (2.00-2.94) ***	2.19 (1.79-2.69) ***
South	2.04 (1.64-2.53) ***	1.95 (1.53-2.47) ***
Mid-West	1.47 (1.17-1.86) **	1.43 (1.12-1.82) **
Sex (ref.: Male)		
Female	2.05 (1.81-2.33) ***	1.88 (1.65-2.14) ***
Age	1.03 (1.02-1.03) ***	1.03 (1.02-1.04) ***

to be continued

Continuation of Table 3

Variable	Crude OR (95%CI)	Adjusted OR(95%CI)
Race/skin color (ref.: White)		
Black	0.84 (0.67-1.04)	0.95 (0.74-1.21)
Yellow	1.49 (0.78-2.84)	1.46 (0.76-2.82)
Brown	0.68 (0.60-0.78) ***	0.85 (0.73-0.99) *
Indigenous	0.59 (0.29-1.22)	0.63 (0.31-1.30)
Can read and write (ref.: Yes)		
No	0.68 (0.59-0.77) ***	-
Years of formal education		
	1.03 (1.02-1.04) ***	1.04 (1.03-1.06) ***
Household registered with ESF (ref.: Yes)		
No	1.16 (0.99-1.37) ^a	0.97 (0.82-1.16)
Does not know	0.88 (0.72-1.08)	0.81 (0.65-0.99) *
Self-rated health (ref.: Very good)		
Good	1.22 (0.99-1.49) ^a	1.44 (1.16-1.79) *
Fair	2.05 (1.67-2.53) ***	2.91 (2.32-3.65) ***
Poor	3.77 (2.80-5.08) ***	5.81 (4.28-7.89) ***
Very poor	8.46 (4.91-14.57) ***	11.66 (6.70-20.27) ***

OR, odds ratio; 95%CI, 95% confidence interval ^a p<0.10; * p<0.05; ** p<0.01; *** p<0.001**Table 4.** Factors associated with dental visit within last 12 months among older adults in Brazil, 2019.

Variable	Crude OR (95%CI)	Adjusted OR (95%CI)
Area of Household (ref.: Urban)		
Rural	0.40 (0.35-0.44) ***	0.79 (0.69-0.89) ***
Region of residence (ref.: North)		
Northeast	0.99 (0.86-1.14)	1.12 (0.96-1.31)
Southeast	2.29 (1.97-2.66) ***	1.59 (1.34-1.87) ***
South	1.97 (1.69-2.30) ***	1.55 (1.30-1.85) ***
Mid-West	1.50 (1.26-1.79) ***	1.23 (1.01-1.49) *
Sex (ref.: Male)		
Female	1.00 (0.92-1.10)	-
Age		
	0.96 (0.95-0.96) ***	0.97 (0.97-0.98) ***
Race/skin color (ref.: White)		
Black	0.53 (0.44-0.64) ***	0.76 (0.62-0.93) **
Yellow	1.15 (0.73-1.81)	0.98 (0.62-1.54)
Brown	0.53 (0.48-0.59) ***	0.83 (0.74-0.94) **
Indigenous	0.31 (0.19-0.51) ***	0.44 (0.26-0.75) **
Can read and write (ref.: Yes)		
No	0.25 (0.22-0.29) ***	-
Years of formal education		
	1.17 (1.16-1.78) ***	1.13 (1.11-1.14) ***
Household registered with ESF (ref.: Yes)		
No	2.02 (1.81-2.27) ***	1.26 (1.12-1.42) ***
Does not know	1.51 (1.29-1.76) ***	1.05 (0.89-1.23)

to be continued

Continuation of Table 4

Variable	Crude OR (95%CI)	Adjusted OR (95%CI)
Self-rated health (ref.: Very good)		
Good	0.57 (0.48-0.86) ***	0.74 (0.63-0.88) **
Fair	0.34 (0.29-0.41) ***	0.64 (0.54-0.77) ***
Poor	0.23 (0.18-0.29) ***	0.52 (0.41-0.66) ***
Very poor	0.23 (0.15-0.33) ***	0.52 (0.34-0.80) **

OR, odds ratio; 95%CI, 95% confidence interval; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

DISCUSSION

The study findings revealed that the older population living in rural areas of Brazil were disadvantaged with regard to the use of health services compared with their urban counterparts. Although the majority of households were registered with the Family Health Strategy (ESF) (Primary Care clinics), the proportion of older respondents that reported having seen a doctor or dentist in the 12 months leading up to interview was lower in rural areas. Similarly, the rate of blood pressure monitoring and blood glucose testing was also lower in the rural population. Despite the overall poorer self-rated health of rural residents, a lower proportion of this group reported seeking health services within the past 2 weeks. However, a higher proportion of rural older adults that sought health services reported being seen the same day compared to patients from urban areas. Health service use was found to be associated with area of residence (rural/urban), region of residence, sex, age, race/skin color, years of formal education, registration with ESF, and self-rated health.

Negative self-rated health is a factor that appears to influence mortality risk⁵ with typically poorer ratings among low-educated individuals and those with a greater number of chronic diseases²¹. Evidence also suggests that people with fewer years of formal education make less use of health services, despite having a worse health status¹³.

Occupational aspects, besides a higher prevalence of males and low-educated individuals in the rural population, might also explain this lower propensity

to seek health services. Studies have shown that self-reported health status is worse among those living in rural than in urban settings, that men are less likely than women to seek health services, and that the behavior of seeking health services increases with higher educational level^{22,23}.

Geographic dispersion and socioeconomic vulnerability, together with a lack of or inadequate public health policies and shortage of resources dedicated to rural populations, have contributed to the situation of characteristic vulnerabilities of rural areas^{7,15,24,25}. Health-service seeking behavior is lower in rural areas and the rise in rurality has reduced perceived unmet health needs, suggesting different expectations of use among users from rural and urban areas^{22,26}.

The distance between rural communities and health services, coupled with other barriers, leads rural residents to delay longer before seeking health compared to individual livings in urban area^{26,27}. Moreover, lack of reliable transportation services is another factor often cited as a barrier to accessing services, where rural residents weigh up the transportation time, cost and risks, often resorting to community services to resolve health issues, irrespective of type of service offered^{17-9,27-30}.

The literature also reveals that health service use by older patients, in addition to being associated with greater educational level, is linked to the notion of needing to seek health services only for diseases, when falling sick or being diagnosed with a chronic disease^{31,32}. For dental services, use is greater

among older individuals experiencing pain and who recognize the need for treatment and/or a dental prosthesis³³. However, the lower availability of health services and professionals in rural areas, together with the greater barriers to access, explain the lower use of health services by older rural dwellers^{16,18}. Data from the 2013 PNS revealed that, of the older citizens surveyed, 16.5% had not seen a doctor and only 28.9% had seen a dentist within the past year¹. Despite an improvement in these rates in the 2019 PNS (10.3% and 34.8%, respectively), a significantly lower proportion of consultations was evident among older adults from rural areas.

Despite the apparent greater coverage by the ESF and the fact that most consultations were performed on the same day of seeking health services in the rural area, better health status and more frequent use of health services was found in the urban area. These findings underscore the importance of distinguishing coverage of primary care from the construct of access, which incorporates other dimensions, such as barriers encountered by older populations in seeking healthcare^{9,30}.

These findings also reveal the need to expand monitoring strategies for older adults with chronic conditions, especially among those living in rural areas, mainly to address the higher number of older patients seen at primary care services with systemic arterial hypertension and diabetes mellitus³⁴. Studies show that rural communities have major problems involving health infrastructure and staff retention, particularly physicians, contributing to poor access to clinical diagnosis and lack of basic equipment such as sphygmomanometers to measure blood pressure^{7,35}.

Evidence also suggests that older rural residents, despite having poorer health status, tend to delay seeking health services, navigating the numerous barriers to care only when there is a greater likelihood of being seen. This situation can lead to a worsening of the frailer health of the aged population¹⁶. A well organized primary health service can help attenuate inequities in access to health services between rural and urban populations^{18,35}. A previous study found that, in remote rural towns, primary care services were the first port of call for users, and that it was not uncommon for nurses to provide the initial

treatment at public primary care clinics due to a shortage of doctors at these facilities³⁵.

In this context, some specific target groups for priority actions can be elected, such as less-educated individuals and those living in rural areas in the North region of the country. Amid still low population coverage, an increase in the number of oral health teams in the ESF units, which are highly prevalent in these territories, can also help boost the use of oral health services.

This study has some limitations, such as the cross-sectional design which limits the interpretation of the findings. Thus, the associations identified should be interpreted with caution. The distribution of variables between rural and urban areas may be influenced by a survival bias (Neyman bias), expressing the prevalence among survivors at the time of the study, leading to underestimation of the worse health outcomes and of health services use in rural areas. Information bias may also have been present, given that the information obtained in the survey were self-reported by the respondents. However, strengths include the fact that the study assessed representative data from a national household survey, identifying differences in outcomes of health services use by older adults from rural versus urban areas in Brazil.

CONCLUSION

The study findings reveal that the older population living in rural areas of Brazil were disadvantaged with regard to the use of health services compared with their urban counterparts. Better self-rated health was found among older residents of urban areas, along with more regular visits to the doctor and dentist. Rurality was associated with lower likelihood of having seen a doctor or dentist in the 12 months leading up to interview, and also with living in the North region of the country and having a low educational level. Male gender was associated with a lower likelihood of medical visits. Older individuals had a greater probability of using medical services, but a lower chance of using dental services. Race/skin color, registration with the ESF and self-rated health, were also associated with health services use. Strategies for reducing barriers to accessing health

services faced by the rural population in Brazil should be implemented that take account of the specificities of the different rural territories in which they live.

AUTHORSHIP

Gleica Soyan Barbosa Alves – study conception and design; data analysis and interpretation; writing; original draft; and approval of final version for publication.

Rosana Cristina Pereira Parente – study conception and design; writing; review and editing; and approval of final version for publication.

Fernando José Herkrath – study conception and design; formal analysis; resources; programs; supervision; validation; writing; review and editing; and approval of final version for publication.

Edited by: Maria Helena Rodrigues Galvão

10 of 11

REFERENCES

1. Stopa SR, Malta DC, Monteiro CN, Szwarcwald CL, Goldbaum M, Cesar CLG. Use of and access to health services in Brazil, 2013 National Health Survey. *Rev Saúde Pública.* 2017;51(suppl 1). Available from: <https://doi.org/10.1590/S1518-8787.2017051000074>
2. Veras RP, Oliveira M. Envelhecer no Brasil: a construção de um modelo de cuidado. *Ciênc saúde coletiva.* June, 2018;23(6):1929–36. Available from: <https://doi.org/10.1590/1413-81232018236.04722018>
3. Almeida APSC, Nunes BP, Duro SMS, Lima R de CD, Facchini LA. Falta de acesso e trajetória de utilização de serviços de saúde por idosos brasileiros. *Ciênc saúde coletiva.* 2020;25(6):2213–26. Available from: <https://doi.org/10.1590/1413-81232020256.27792018>
4. Brasil. Portaria N. 2528 de 19 de outubro de 2006. Aprova a Política Nacional de Saúde da Pessoa Idosa [Internet]. Portaria N. 2528/2006, 2006. Available from: https://bvsms.saude.gov.br/bvs/saudelegis/gm/2006/prt2528_19_10_2006.html
5. Ramos LR. Fatores determinantes do envelhecimento saudável em idosos residentes em centro urbano: Projeto Epidoso, São Paulo. *Cad Saúde Pública.* 2003;19(3):793–7. Available from: <https://doi.org/10.1590/S0102-311X2003000300011>
6. Amaral FLJ dos S, Motta MHA, Silva LPG da, Alves SB. Fatores associados com a dificuldade no acesso de idosos com deficiência aos serviços de saúde. *Ciênc saúde coletiva.* 2012;17(11):2991–3001. Available from: <https://doi.org/10.1590/S1413-81232012001100016>
7. Gama ASM, Fernandes TG, Parente RCP, Secoli SR. Inquérito de saúde em comunidades ribeirinhas do Amazonas, Brasil. *Cad Saúde Pública.* 2018;34(2). Available from: <https://doi.org/10.1590/0102-311X00002817>
8. Garbaccio JL, Tonaco LAB, Estêvão WG, Barcelos BJ. Aging and quality of life of elderly people in rural areas. *Rev Bras Enferm.* 2018;71(suppl 2):724–32. Available from: <https://doi.org/10.1590/0034-7167-2017-0149>
9. Garnelo L, Parente RCP, Puchiarelli MLR, Correia PC, Torres MV, Herkrath FJ. Barriers to access and organization of primary health care services for rural riverside populations in the Amazon. *Int J Equity Health.* 2020;19(1):54. Available from: <https://doi.org/10.1186/s12939-020-01171-x>
10. Silva KF da, Pucci VR, Weiller TH, Mayer BLD, Concatto MEP. O acesso do idoso na Atenção Primária à Saúde: uma revisão integrativa. *APS.* 2018;21(1). Available from: <https://doi.org/10.34019/1809-8363.2018.v21.15911>
11. Gama ASM, Secoli SR. Self-medication practices in riverside communities in the Brazilian Amazon Rainforest. *Rev Bras Enferm.* 2020;73(5):e20190432. Available from: <https://doi.org/10.1590/0034-7167-2019-0432>
12. Guimarães AF, Barbosa VLM, Silva MP da, Portugal JKA, Reis MH da S, Gama ASM. Acesso a serviços de saúde por ribeirinhos de um município no interior do estado do Amazonas, Brasil. *Revista Pan-Amazônica de Saúde.* 2020;11(0). Available from: <http://dx.doi.org/10.5123/s2176-6223202000178>
13. Travassos C, Castro MSM de. Determinantes e desigualdades sociais no acesso e na utilização de serviços de saúde. Em: *Políticas e Sistema de saúde no Brasil.* 2o ed Rio de Janeiro: Fiocruz; 2012. p. 183–206.
14. The Lancet. Rural health inequities: data and decisions. *The Lancet.* 2015;385(9980):1803. Available from: [https://doi.org/10.1016/S0140-6736\(15\)60910-2](https://doi.org/10.1016/S0140-6736(15)60910-2)
15. Aljassim N, Ostini R. Health literacy in rural and urban populations: A systematic review. *Patient Education and Counseling.* 2020;103(10):2142–54. Available from: <https://doi.org/10.1016/j.pec.2020.06.007>
16. Travassos C, Viacava F. Acesso e uso de serviços de saúde em idosos residentes em áreas rurais, Brasil, 1998 e 2003. *Cad Saúde Pública.* 2007;23(10):2490–502. Available from: <https://doi.org/10.1590/S0102-311X2007001000023>

17. Wonca Working Party on Rural Practice. Política de Qualidade e Eficácia dos Cuidados de Saúde Rural. *Rev Bras Med Fam Comunidade*. 2013;8(Suppl 1):15–24. Available from: [http://dx.doi.org/10.5712/rbmfc8\(1\)728](http://dx.doi.org/10.5712/rbmfc8(1)728)
18. Bousquat A, Fausto MCR, Almeida PF de, Lima JG, Seidl H, Sousa ABL, et al. Remoto ou remotos: a saúde e o uso do território nos municípios rurais brasileiros. *Rev saúde pública*. 2022;56:73. Available from: <https://doi.org/10.11606/s1518-8787.2022056003914>
19. Francisco PMSB, Assumpção D de, Bacurau AG de M, Silva DSM da, Malta DC, Borim FSA. Multimorbidity and use of health services in the oldest old in Brazil. *Rev bras epidemiol*. 2021;24(suppl 2):e210014. Available from: <https://doi.org/10.1590/1980-549720210014.supl.2>
20. Stopa SR, Szwarcwald CL, Oliveira MM de, Gouvea E de CDP, Vieira MLFP, Freitas MPS de, et al. Pesquisa Nacional de Saúde 2019: histórico, métodos e perspectivas. *Epidemiol Serv Saúde*. 2020;29(5):e2020315. Available from: <http://dx.doi.org/10.1590/s1679-49742020000500004>
21. Lindemann IL, Reis NR, Mintem GC, Mendoza-Sassi RA. Autopercepção da saúde entre adultos e idosos usuários da Atenção Básica de Saúde. *Ciênc saúde coletiva*. 2019;24(1):45–52. Available from: <https://doi.org/10.1590/1413-81232018241.34932016>
22. Arruda NM, Maia AG, Alves LC. Desigualdade no acesso à saúde entre as áreas urbanas e rurais do Brasil: uma decomposição de fatores entre 1998 a 2008. *Cad Saúde Pública*. 2018;34(6). Available from: <https://doi.org/10.1590/0102-311X00213816>
23. De Macedo E, Ulrich V, Bós AMG, Bós ÂJG. Fatores relacionados à autopercepção do estado de saúde em idosos residentes no meio rural do Brasil. *Sci Med*. 2018;28(3):29698. Available from: <https://doi.org/10.15448/1980-6108.2018.3.29698>
24. Brasil. Política Nacional de Saúde Integral das Populações do Campo e da Floresta. 1a edição, 1a reimpressão. Brasília, DF: Ministério da Saúde; 2013. 47 p.
25. Oliveira AR de, Sousa YG de, Silva DM da, Alves JP, Diniz ÍVA, Medeiros SM de, et al. A Atenção Primária à Saúde no contexto rural: visão de enfermeiros. *Rev Gaúcha Enferm*. 2020;41:8. Available from: <https://doi.org/10.1590/1983-1447.2020.20190328>
26. Murphy P, Burge F, Wong S. Measurement and rural primary health care: a scoping review. *Rural Remote Health*. 2019; 19:4911. Available from: <https://doi.org/10.22605/RRH4911>
27. Franco CM, Lima JG, Giovannella L. Atenção primária à saúde em áreas rurais: acesso, organização e força de trabalho em saúde em revisão integrativa de literatura. *Cad Saúde Pública*. 2021;37(7):e00310520. Available from: <https://doi.org/10.1590/0102-311X00310520>
28. Magalhães DL, Matos R da S, Souza A de O, Neves RF, Costa MMB, Rodrigues AA, et al. Acesso à saúde e qualidade de vida na zona rural. *RSD*. 2022;11(3):e50411326906. Available from: <http://dx.doi.org/10.33448/rsd-v11i3.26906>
29. Wong S, Regan S. Patient perspectives on primary health care in rural communities: effects of geography on access, continuity and efficiency. *RRH*. 2009; 9: 1142. Available from: <https://doi.org/10.22605/RRH1142>
30. Rodrigues KV, Almeida PF de, Cabral LM da S, Fausto MCR. Organização da Atenção Primária à Saúde em um município rural remoto do norte do Brasil. *Saúde debate*. 2021;45(131):998–1016. Available from: <https://www.saudeemdebate.org.br/sed/article/view/5730>
31. Ferreira LS, Moreira LR, Paludo S dos S, Meucci RD. Acesso à Atenção Primária à Saúde por idosos residentes em zona rural no Sul do Brasil. *Rev saúde pública*. 2020;54:149. Available from: <https://doi.org/10.11606/s1518-8787.2020054002316>
32. Malta DC, Bernal RTI, Gomes CS, Cardoso LS de M, Lima MG, Barros MB de A. Inequalities in the use of health services by adults and elderly people with and without noncommunicable diseases in Brazil, 2019 National Health Survey. *Rev bras epidemiol*. 2021;24(suppl 2):e210003. Available from: <https://doi.org/10.1590/1980-549720210003.supl.2>
33. Martins AMEDBL, Oliveira RFRD, Haikal DS, Santos ASF, Souza JGS, Alecrim BPA, et al. Uso de serviços odontológicos públicos entre idosos brasileiros: uma análise multinível. *Ciênc saúde coletiva*. 2020;25(6):2113–26. Available from: <https://doi.org/10.1590/1413-81232020256.19272018>
34. Cesário VAC, Santos MM dos, Mendes TC de O, Souza Júnior PRB de, Lima KC de. Tendências de acesso e utilização dos serviços de saúde na APS entre idosos no Brasil nos anos 2008, 2013 e 2019. *Ciênc saúde coletiva*. 2021;26(9):4033–44. Available from: <https://doi.org/10.1590/1413-81232021269.08962021>
35. Fausto MCR, Almeida PFD, Bousquat A, Lima JG, Santos AMD, Seidl H, et al. Atenção Primária à Saúde em municípios rurais remotos brasileiros: contexto, organização e acesso à atenção integral no Sistema Único de Saúde. *Saude soc*. 2023;32(1):e220382pt. Available from: <https://doi.org/10.1590/S0104-12902023220382pt>



Scientific publications on driving by older adults: scope review

Danielle Félix Arruda Mourão¹ 
Eveline Alves Oliveira² 
Alice Silva Osterne Ribeiro² 
Paulo César de Almeida¹ 
Thalis Rebouças de Oliveira³ 
Maria Célia de Freitas¹ 

Abstract

Objective: To map national and international scientific evidence regarding driving by older adults. **Method:** Scope review based on the manual proposed by the Joanna Briggs Institute. Searches were conducted in the MEDLINE, Web of Science, Scopus, SciELO databases, and grey literature through Google Scholar. **Results:** Out of 1,194 studies identified, 189 papers meeting eligibility criteria were selected. Pioneering countries in publications were Australia and the United States, with the peak of research occurring between 2013 and 2014. Study participants included healthy older adults (63.49%, 120), followed by those with Alzheimer's disease (17.46%, 33), Mild Neurocognitive Disorder (11.11%, 21), Parkinson's disease (6.88%, 13), and other comorbidities (19.58%, 37). Various interventions were identified, with 94.02% (178) assessing the effectiveness of instruments measuring the fitness of older drivers. **Conclusion:** There was a prevalence of studies aimed at identifying assessment tools to measure the functionality of older drivers. This underscores the importance of standardized, validated, and economically viable assessments that contribute to identifying at-risk drivers. The need for interventions in geriatrics and gerontology was evident, emphasizing the necessity for actions to establish a specialized multidisciplinary team in vehicular driving. This approach seeks to align licensing guidelines with the specific needs of older drivers, taking into account social, economic, political, and educational aspects, particularly within the Brazilian traffic departments.

Keywords: Older adult.
Vehicle Driving. Driver's
License Examination. Traffic
Safety. Occupational therapy.

¹ Universidade Estadual do Ceará, Departamento de Enfermagem, Programa de Pós-Graduação em Cuidados Clínicos em Enfermagem e Saúde (PPCCLIS). Fortaleza, CE, Brasil.

² Universidade Estadual do Ceará, Departamento de Enfermagem, Grupo de Pesquisa Enfermagem, Educação, Saúde e Sociedade. Fortaleza, CE, Brasil.

³ Universidade Federal do Ceará, Departamento de Estatística e Matemática Aplicada. Fortaleza, CE, Brasil.

The authors declare that there is no conflict in the conception of this work.

There was no funding to carry out this work

Correspondence

Danielle Félix Arruda Mourão
daniellearruda.doutorado@gmail.com

Received: 22 May, 2023
Approved: 8 November, 2023

INTRODUCTION

Driving is a complex instrumental activity of daily living, highly valued among older individuals and closely linked to the feelings of well-being, autonomy, and independence, as outlined in the official document Occupational Therapy Practice Framework: Domain and Process¹. The cessation of driving hinders the fulfillment of tasks, potentially leading to social isolation and depressive symptoms².

Driving licenses for older adults can vary based on the country, age, and the driver's health status. European countries implement different validity periods, ranging from indefinite licenses in Austria and Germany to restricted licenses renewed every three years in Greece and Ireland for drivers above 65 years old³. Regarding health aspects, 24 federations in the United States and the District of Columbia have optional assessment policies, while in the remaining 26 states, mandatory mental tests assessing information interpretation and appropriate judgment are required^{4,5}. In Brazil, Law number 14,071 of 2020 states: "when there is evidence of physical or mental disability, or progressiveness of illness that may reduce the ability to drive the vehicle, the expected deadlines may be shortened", being the responsibility of the expert⁶.

According to guidelines published by the American Association of Motor Vehicle Administrators, aging is associated with a decline in functional abilities (sensory, physical, and cognitive), which can impact both the fitness and performance of older drivers, potentially resulting in an inability to drive^{7,8}. Various factors compromise the motor competence of older drivers, including diminished visual and auditory acuity, musculoskeletal deficiencies (strength and flexibility), clinical condition, side effects of medications, and cognitive decline. The latter warrants attention to reaction time, processing speed, and attention, as they are crucial for the safety of the driving act⁹.

Cognitive declines are typically associated with neurodegenerative diseases, but there are individuals with these limitations who do not meet the diagnostic criteria for dementia. These individuals fall under the category of Mild Cognitive Impairment (MCI),

currently referred to as Mild Neurocognitive Disorder (MNCNCD). Identifying older drivers with cognitive impairment poses a challenge for scholars in the field, necessitating assessments across various domains⁹.

It is essential to understand that discussions regarding driving competence are challenging and often give rise to significant family conflicts. The ethical considerations surrounding the decision to cease driving are delicate, thereby straining the physician/ patient relationship⁹. Consequently, a notable gap emerges in public safety and collective health, a concern that should not only be of interest to families but also to healthcare professionals, traffic authorities, and governmental bodies.

Thus, the importance of compiling research in this context is acknowledged, with the objective of mapping national and international scientific evidence regarding driving by older adults.

METHOD

This is a scope review based on the manual proposed by the Joanna Briggs Institute¹⁰, utilizing the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR)¹¹. The review followed the five stages of development: 1 - identification of review questions; 2 - locating relevant studies; 3 - study selection; 4 - data extraction; 5 - synthesis, summary, reporting of results to maintain the rigor of the review process¹². The protocol for this scope review has been appropriately registered on the Open Science Framework (OSF) (<https://osf.io/>), with a DOI number: 10.17605/OSF.IO/86BNK.

The mnemonic strategy Population, Concept, and Context (PCC) was employed, where P = older adults; C = licensed older adults; C = assessment of vehicular driving globally. Accordingly, the guiding question was formulated: What are the national and international scientific evidences regarding vehicular driving by older adults?

The search strategy was developed using the indexers: Health Sciences Descriptors (Descritores Ciências da Saúde - DeCS) and Medical Subject Headings (MeSH), in conjunction with uncontrolled

language: "aged"; "automobile driver examination"; "neuropsychological test"; "geriatric assessment"; "cognition" and "occupational therapy". The Boolean operator AND was also employed to enhance sensitivity.

To conduct the searches, the following databases were accessed: Latin American and Caribbean Health Sciences Literature (LILACS) and Medical Literature Analysis and Retrieval System Online (MEDLINE) via the Virtual Health Library (Biblioteca Virtual de Saúde - BVS), Web of Science from the Institute for Scientific Information, Scopus and the Scientific Electronic Library Online (SciELO). Additionally, for grey literature, Google Scholar was utilized.

Full-text papers were included in the review if the population studied consisted of individuals aged 60 years or older, in accordance with the older person's statute in Brazil¹³. Additionally, included were papers that addressed the guiding question. Exclusions comprised letters to the editor, pre-communications, editorials, experiential reports, works published in event proceedings, and book chapters. No temporal restrictions or language limits were applied.

The searches were conducted in January 2023, using a paired and blind approach. Following the removal of duplicate studies in the EndNote reference manager and data refinement through Rayyan QCRI, titles and abstracts were assessed by two independent reviewers (EAO and ASOR), adhering to the inclusion criteria. Any discrepancies or uncertainties were resolved through discussions until consensus was reached between the researchers. Reviewers then proceeded to read the full papers to identify publications aligned with the stated objective, and exclusions were duly justified. Persistent disagreements were resolved by a third reviewer (DFAM), who evaluated the inconsistencies.

For data extraction, the template "Source of evidence details, characteristics and results extraction instrument"¹⁰ from the Joanna Briggs Institute (JBI)

was adapted and organized into a table with 10 items, divided into two chapters. The first chapter pertained to study characteristics (title, author, year, country, objective, and population), and the second focused on results extracted from the studies (method, type of intervention, outcome, and researchers' professions).

Regarding levels of evidence, the papers were analyzed and categorized based on the type of study, following the criteria outlined in the JBI Levels of Evidence¹⁴. Classifications were distributed across efficacy, diagnosis, prognosis, economic evaluations, and significance.

The data were organized into five categories: population (healthy older adults and those with comorbidities), types of intervention (educational and evaluative), country and year of the papers, and finally, the profession of researchers (authors of the papers and assessors of tests).

The information was stored in a database, aided by text editing programs and spreadsheets designed in statistical software to reorganize variables and facilitate the construction of graphical elements.

DATA AVAILABILITY

All the datasets supporting the results of this study are available upon request from the corresponding author, Danielle Félix Arruda Mourão.

RESULTS

Identified 1,194 papers, removed 805 duplicates, 81 after title and abstract analysis, and 119 after applying eligibility criteria (population below 60 years, not responding the guiding question, inaccessible, and also including letters to the editor, theses, and reports). Thus, 189 papers were included in this review, with the search and study selection process outlined in the flowchart (Figure 1. [Supplementary File](#)).

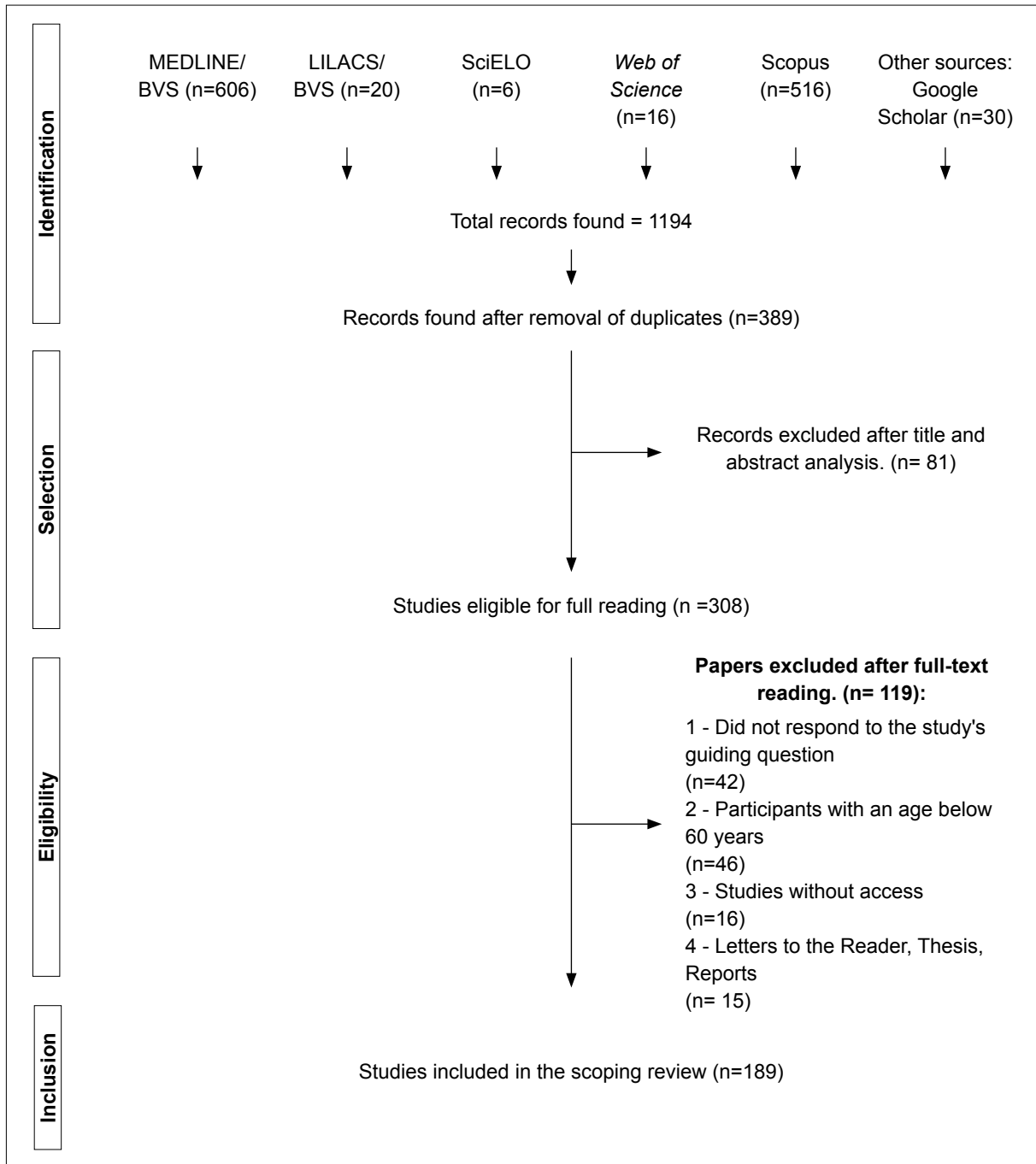


Figure 1. Flowchart of the research process, inclusion and exclusion of peer-reviewed studies for the evidence map and scoping review. Fortaleza, CE, 2023.

Source: Adapted from PRISMA-ScR¹¹.

The selected papers were produced in 21 countries, distributed across the following continents: 20.63% (39) in Europe (United Kingdom, Ireland, Belgium, Sweden, France, Portugal, Italy, Norway, Finland, Austria, Denmark, Netherlands, and Germany); 56.08% (106) in the Americas (United States, Canada, Argentina, and Brazil); 17.46% (33) in Oceania (Australia and New Zealand); and 5.82% (11) in Asia (Japan and Iran).

When considering the year of publication of the papers, it was identified that they were published between 1991 and 2023. During this period, scientific productions were not detected in only four years. The precursors in 1991 were Australia and the United States, which, together with Canada, appeared most frequently in the publications, with 68 (35.98%), 31 (16.40%), and 27 (14.29%) papers found, respectively.

In contrast, scientific productions in other countries did not exceed 10 papers, including Brazil, where nine (4.76%) were identified. It is worth noting that the decade from 2011 to 2021 was the period

of greatest interest in the subject, resulting in a high number of publications, totaling 52.91% (100), with the peak occurring between 2013 and 2014 (Figure 2).

Interest in the theme emerged from various professional categories; however, physicians, psychologists, and occupational therapists stood out with a higher number of publications. Physicians (306) contributed to the authorship of 117 papers, distributed across specialties: 183 general practitioners, 45 neurologists, 40 geriatricians, 15 psychiatrists, 14 ophthalmologists, six physiatrists, one otolaryngologist, one cardiologist, and one orthopedist. Psychologists (192) were present in 91 studies, and occupational therapists (185) in 84 papers. In addition to authoring papers, these three professional categories were also prominent in test administration. However, in this role, occupational therapists took the lead, appearing in 44 studies, followed by psychologists in 20, and physicians in nine. It is noteworthy that other professional categories either did not administer tests, were not identified, or were classified as "other" due to an insignificant number of publications (Figure 3).

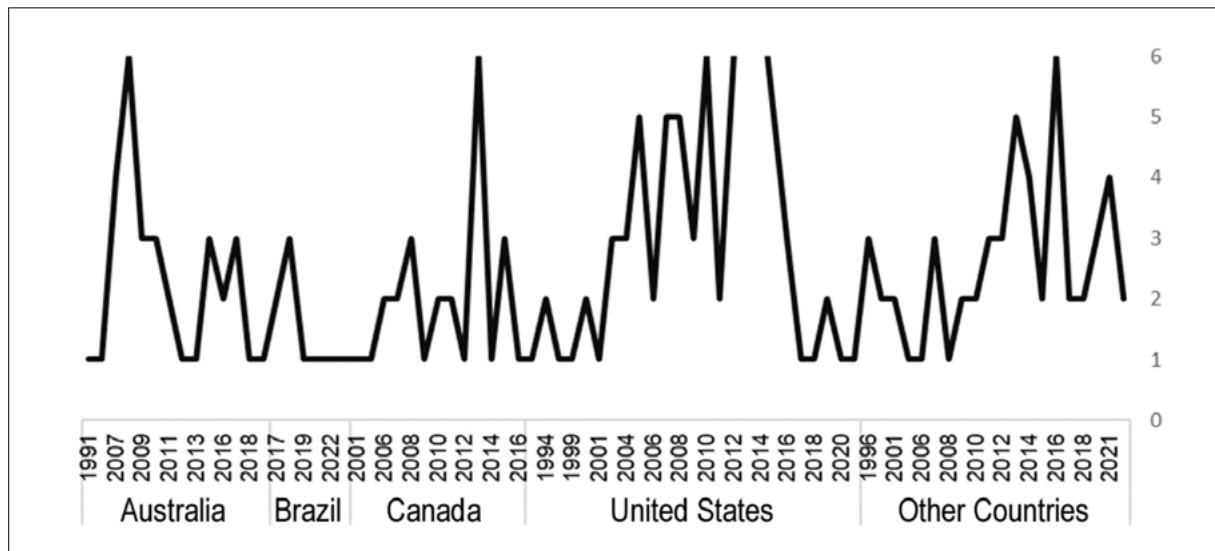


Figure 2. Scientific production on the vehicular driving of older adults by country and year of publication (1991-2023).

Source: Prepared by the authors.

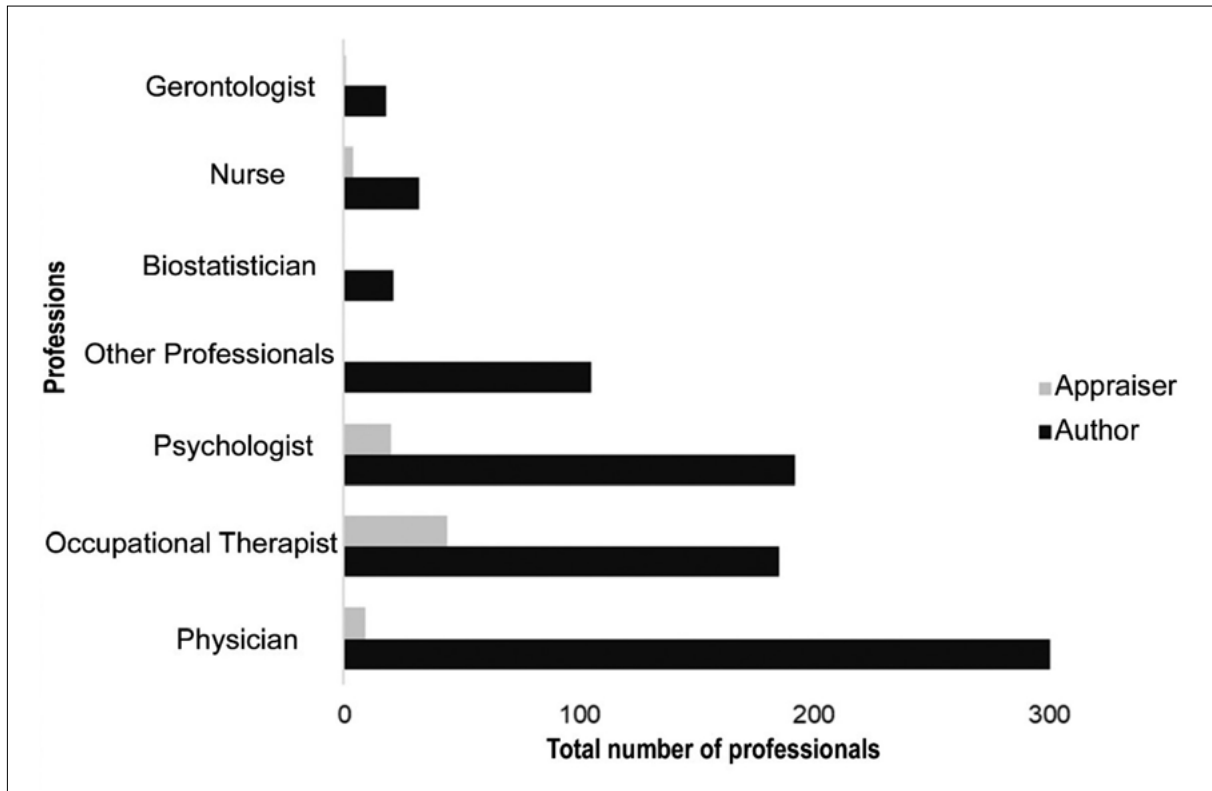


Figure 3. Number of scientific publications on older drivers categorized by professional status of the author or evaluator of tests. Fortaleza, CE, 2023.

Source: Prepared by the authors.

In papers^{8,15-18}, it was identified that the evaluation process of motor competence is developed through interdisciplinary collaboration among healthcare professionals. The off-road (at clinic) assessment begins with a screening conducted by a social assistant, involving an interview on driving and psychosocial history, along with a nurse who investigates health history and variables influencing the decline of essential functions for driving. Physicians analyze clinical aspects affecting driving, when necessary, request diagnostic tests, and assess the effects of medications on driving. The psychologist performs mental screening, planning, and organization. This is followed by the administration of tests evaluating physical, sensory, and cognitive functions by an occupational therapist. The gold standard evaluation, on-road, is conducted by a driving instructor sitting in the passenger seat, providing instructions, analyzing rules, and ensuring safety in driving situations. Simultaneously, the occupational therapist in the back seat assesses qualitative aspects of the

driver's behavior in terms of vigilance, confidence, distraction, and impulse control, and may also make vehicle adaptations and driving restrictions. After these procedures, the assessment team convenes to discuss performance, classify the driver, and make recommendations to be conveyed during the feedback meeting that the social assistant conducts with the driver and their family.

Regarding older drivers, it was observed that 55.70% (127) were healthy older individuals, 14.47% (33) had Alzheimer's disease (AD), 9.21% (21) had Mild Neurocognitive Disorder (MNCD), 5.70% (13) had Parkinson's disease, and 14.91% (34) had other comorbidities. It is important to note that some studies were scored more than once due to their development with more than one type of participant and/or being conducted in more than one country.

Diverse types of interventions were identified and categorized according to their approach, being

evaluative and educational. Evaluative interventions accounted for 94.38% (185), further subdivided into 79.59% (156) interventions assessing the effectiveness of instruments measuring the driving fitness of older adults; 8.16% (16) interventions evaluating the performance/procedures of healthcare professionals to assess the fitness of older drivers; 2.55% (5) interventions examining the behavior of family caregivers regarding older drivers; and 4.08% (8) interventions appraising licensing guidelines across various countries (Table 1).

The papers^{19,20} addressing interventions assessing the performance/procedures of healthcare professionals underscored the importance of identifying the extent to which they evaluate mental function for driving fitness in the face of diverse limitations, be they cognitive, physical, or sensory. The objectives of these investigations were centered on detecting strategies employed by professionals for ceasing driving in older individuals; quantifying the effectiveness and reliability of different assessors in categorizing driving behaviors in older adults for licensing authorities; and examining how to

provide recommendations regarding licenses for older drivers.

Concerning educational interventions, 5.61% (11) were focused on: three on the education of older adults, six on raising awareness and training professionals for the assessment of older drivers, and two on guiding and supporting family caregivers. It is noteworthy that the intersection of intervention types with countries exceeds 100%, due to studies conducted in two or more countries (Table 1).

Upon analyzing the levels of evidence in the studies, 69.84% (132) were identified for Efficacy; 15.87% (30) for Diagnosis; 9.52% (18) for Significance; 4.76% (9) for Prognosis, and no studies were identified for Economic Evaluations. Among the levels of evidence for Efficacy, observational studies without a control group of level 3E stood out. Regarding levels of evidence for Diagnosis, studies on test accuracy among non-consecutive patients of level 2B were prominent. As for Significance, the prevalence was of unique qualitative studies of level 3. For Prognosis, initial cohort studies of level 1B were emphasized (Table 2).

Table 1. Participants and types of interventions identified in the 189 selected studies and distributed by country. Fortaleza, CE, 2023.

	Countries					Total %
	USA	Canada	Australia	Brazil	Others	
Participants	n (%)	n (%)	n (%)	n (%)	n (%)	Total %
HOP	46 (20.18)	22 (9.65)	17 (7.46)	9 (3.95)	33 (14.47)	55.70
PAD	17 (7.46)	3 (1.32)	5 (2.19)	-	8 (3.51)	14.47
POCD	6 (2.63)	1 (0.44)	4 (1.75)	-	10 (4.39)	9.21
PPD	6 (2.63)	1 (0.44)	3 (1.32)	-	3 (1.32)	5.70
POD	17 (7.46)	2 (0.88)	7 (3.07)	-	8 (3.51)	14.91
Total	92 (40.35)	29 (12.72)	36 (15.79)	9 (3.95)	62 (27.19)	100.00
Types of Interventions	n (%)	n (%)	n (%)	n (%)	n (%)	Total %
EDU	7 (3.57)	4 (2.04)	-	-	-	5.61
IA	58 (29.59)	21 (10.71)	25 (12.76)	9 (4.59)	43 (21.94)	79.59
PA	7 (3.57)	1 (0.51)	3 (1.53)	-	5 (2.55)	8.16
GA	2 (1.02)	-	3 (1.53)	-	3 (1.53)	4.08
FA	2 (1.02)	-	1 (0.51)	-	2 (1.02)	2.55
Total	76 (38.78)	26 (13.27)	32 (16.33)	9 (4.59)	53 (27.04)	100.00

HOP: Healthy Older Participants; PAD: Participants with Alzheimer's Disease; POCD: Participants with Other Cognitive Diseases; PPD: Participants with Parkinson's Disease; POD: Participants with Other Diseases; EDU: Educational; IA: Instrument Assessment; PA: Professional Assessment; GA: Guideline Assessment; FA: Family Assessment. Source: Prepared by the authors.

Table 2. Classification of the level of evidence of the studies included in the review according to the Joanna Briggs Institute (2013).

CLASSIFICATION OF LEVELS OF EVIDENCE	
Efficacy	
Level 1A - Systematic review of controlled randomized controlled trials (RCTs)	2
Level 1B - Systematic review of RCT and other study designs	2
Level 1C - Randomized Controlled Trial	8
Level 1D - Pseudo-Randomized Controlled Trial	13
Level 3A - Systematic review of comparable cohort studies	3
Level 3B - Systematic review of comparable cohort studies and other lower-level study designs	3
Level 3C - Cohort study with a control group	7
Level 3D - Case-control study	13
Level 3E - Observational study without a control group	39
Level 4A - Systematic review of descriptive studies	1
Level 4B - Cross-sectional study	32
Level 4C - Case series	3
Level 4D - Case study	2
Level 5C - Bench research/ single expert opinion	4
Diagnosis	
Level 2A - Systematic review of accuracy studies of tests among non-consecutive patients	1
Level 2B - Study of test accuracy among non-consecutive patients	22
Level 3B - Diagnostic case-control study	1
Level 4B - Individual diagnostic performance studies	6
Prognosis	
Level 1B - Initial cohort study	5
Level 3B - Cohort study (or control arm of an RCT)	4
Significance	
Level 3 - Single qualitative study	15
Level 5 - Single expert opinion	3

Source: Prepared by the authors.

DISCUSSION

Among the 21 countries distributed across four continents identified in this review, the prominence of the United States, Australia, and Canada can be explained by the concern for the safety of older drivers predating the 1990s. This is evidenced by a study conducted in 1988 in the United States, which mentioned the obligation for physicians to report to local licensing authorities when patients presented health issues²¹.

In this regard, researchers from these countries were motivated to develop programs linked to

licensing authorities, comprising interviews with older drivers and their family members, clinical assessments, neurocognitive, physical, and sensory evaluations, in addition to on-road assessments, to facilitate the identification of drivers at risk.

In the United States, the DriveWise program addresses clinical concerns and emotional needs of drivers whose driving safety is in question; it is staffed by professionals specialized in the field of gerontology⁹.

In Australia, the Occupational Therapy Driver Off-Road Assessment Battery (OT-DORA) was

developed to assess driving performance using a series of standardized tests that should be used in conjunction with the licensing guidelines of the VicRoads project²².

In Canada, a program was developed in partnership with provincial and federal transportation agencies, called Candrive. The aim of Candrive is to create a valid screening tool to identify drivers who require comprehensive evaluation and to determine driving safety²³.

In Brazil, the studies identified in this review focused on the following aspects: 1- characterization of older drivers²⁴; 2- assessment of gait speed, grip strength, cognition, and frailty, associating them with results from physical and mental fitness exams conducted for vehicular licensing or with the number of traffic violations in different driving environments^{16,25-30}; and 3- the search for instruments for evaluating older drivers³¹. However, educational, evaluative, and rehabilitative programs linked to traffic departments for older individuals, their families, and professionals involved in the (re)licensing process were not identified. This gap underscores the need for further research on the subject. It is noteworthy that the Brazilian Traffic Code⁶ provides for assessments and clinical exams for the general population and does not mandate specific evaluations for the (re) licensing of individuals aged 60 or older.

The decade highlighted in the publications of this review spanned from 2011 to 2021, justified by two factors. The first factor underscores the unprecedented global growth of individuals aged 60 and above during this decade, a trend not witnessed since the 1950³². The second factor is linked to the establishment of the Decade of Action for Road Safety 2011-2020, which contributes to the findings of the study. This global initiative prompted governmental institutions worldwide to adopt preventive measures against traffic accidents. It is noteworthy that during this period, traffic incidents held the eighth position among causes of death on a global scale³³.

The professional category of the authors involved in the production of studies is a relatively underexplored aspect in the literature, yet it proves to be pertinent in uncovering the knowledge domains that have demonstrated interest in the subject

matter and their respective needs. This exploration aims to propel advancements in scientific research and, consequently, in interventions targeted at the pertinent population. In this regard, it was observed that, despite physicians being the most prominent professional category in the authorship of papers, geriatricians did not emerge as the most prolific contributors on the subject, nor did professionals specializing in gerontology.

The "Clinician's Guide to Assessing and Counseling Older Drivers"⁷ aligns with the findings by emphasizing that healthcare professionals should concentrate on a comprehensive driving assessment, encompassing both clinical evaluation and on-road assessment. This evaluation should measure higher-order functions in executive domains such as decision-making, navigation, and problem-solving. The results should be utilized for informed judgment regarding the individual's likely driving capability.

The Austroads document³⁴ underscores that actions of the multidisciplinary team should be grounded in the early identification of functional decline, investigation into the driver's daily routine, and optimization of their capacity. Emphasis is placed on the significance of counseling the driver and the close collaboration of healthcare professionals with licensing authorities. This collaboration involves issuing reports regarding health conditions, vehicle adaptations, rehabilitation, or driving restrictions.

It was observed that evaluative interventions were directed towards four approaches: the behavior of family caregivers concerning older drivers, the role of healthcare professionals, the effectiveness of assessment instruments, and licensing guidelines. Concerns related to these approaches are pertinent to numerous countries globally, including Brazil, as they encompass crucial objectives for older adult care in traffic and hold significance for the practice of geriatrics and gerontology.

Regarding interventions concerning the assessment of the effectiveness of instruments measuring the driving aptitude of older individuals, a common interest among researchers was identified in the search for programs, protocols, batteries, screening tools, screening measures, or even tests that serve as reliable predictors for assessing the motor

competence of this population. In the literature, other studies^{35,36} emphasize that the application of isolated tests is not conclusive in predicting the risks associated with driving among older drivers, whether or not they exhibit cognitive limitations.

Research^{4,37} on interventions assessing licensing guidelines in various countries converge on a systematic proposal that advocates for the use of assessment instruments based on a community-referenced model. This model involves a three-tiered evaluation process, including: 1- a brief screening of skills, 2- a standard knowledge test along with perceptual response time, and 3- assessment by experts and/or on-road evaluation. Importantly, this model does not rely on age as a determining factor. These studies highlight the advantages of restrictive (re)licensing policies, incorporating a transitional stage of restricted driving. This approach avoids premature and often abrupt and traumatic cessation of driving, enabling individuals to remain on the road safely for as long as possible. In accordance, member countries of the Organization for Economic Cooperation and Development (OECD), in their 2001 report with projections for 2030, caution national governments to reconsider licensing policies and strategies. They advocate for collaboration with universities to work within research groups to develop programs aimed at assessing functional limitations that impede traffic safety. The report also emphasizes the identification of limitations that can be overcome, outlining effective rehabilitation options³⁸.

Educational interventions, in turn, focused on the education of older individuals, awareness and training of professionals for the assessment of older drivers, as well as guidance and support for family/caregivers.

Concerning the education of older drivers, the studies^{9,39} included in the review present educational programs designed to assist this demographic in maintaining safe driving practices. These programs involve practical interventions addressing safety content, behavioral changes, and adjustments for both the driver and the vehicle. The aim is to prevent traffic violations and accidents through education on safe driving practices. In agreement, a systematic review conducted in 2020⁴⁰ discusses the impact of

interventions on the driving behavior of healthy older individuals. It points out that the benefits depend on the type of training conducted. For example, education-based training with widespread use has proven efficacy in increasing knowledge and self-awareness among drivers. However, this isolated action is not sufficient to improve the ability to drive safely or reduce collisions. On the other hand, computer-based interventions indicated a reduction in the risk of involvement in accidents over time, proving to be a viable option. Mixed interventions also yielded positive results, as perceived by drivers, in terms of skills and positive behavioral changes upon returning to the road.

Regarding the awareness and training of professionals for the assessment of older drivers, the studies revealed data on gaps in the knowledge of these professionals. This situation engenders a sense of insecurity related to how to support patients as they approach the moment of ceasing driving or during the application of driving performance assessments⁴¹. Consistent with these findings, Scott et al.⁴² reported the difficulty that general clinicians face in managing conversations about ceasing driving with patients with dementia. They emphasized the importance of patients and their families understanding the impacts that dementia has on driving to facilitate the acceptance of discontinuing vehicular operation when the time comes.

Guidance and support for family/caregivers are crucial, considering that some spouses contribute to the continuation of unsafe driving by older individuals. For instance, Jett et al.⁴³ mention the preference of wives to act as co-pilots for their spouses rather than assuming the responsibility of driving. They highlight the difficulty that family members/caregivers face in convincing older drivers that driving has become unsafe. In alignment with this, Liddle et al.⁴⁴ described strategies used by family members of drivers with dementia during the cessation process. These strategies include collaborative negotiation of driving cessation agreements, family members volunteering to drive, reducing the visibility of the car or related items, and restricting the routes and times of driving. The significance of support groups for caregivers is also emphasized.

Regarding levels of evidence, 15.87% of the total search (189) was classified as level 1 for efficacy and prognosis ratings. A similar finding was evidenced in the systematic review conducted by Classen et al.⁴⁵, highlighting the need for more continuous randomized clinical trials and level 1 studies. Well-designed intervention studies provide valuable insights into the effectiveness of these actions and contribute to informed clinical decision-making.

It is noteworthy to add that, although expert opinion falls under level 5 in terms of evidence, this type of study enables researchers to understand the scenario related to vehicular driving from the perspectives of professionals, family members, and the drivers themselves. Regarding this, Neilson et al.⁴⁶ emphasize the importance of such studies, noting the need for qualitative data to comprehend the challenges that healthcare professionals face in their daily practice.

Considering the complexity of the subject matter, it is believed that the limitations of this review manifested when elucidating the comorbidities that may impact vehicular control and in addressing the instruments employed in the assessment process of the drivers in question, which may have been superficially expounded upon.

CONCLUSION

This review has delineated scientific evidence regarding diverse perspectives on older individuals' vehicular operation within both national and international contexts. It has underscored that the United States, Australia, and Canada have undertaken a substantial body of research encompassing evaluative and educational interventions, thereby affording enhanced support to older drivers, their families, and healthcare professionals, in collaboration with governmental entities.

It further emphasized the imperative for new studies concerning the subject matter, given global projections indicating a rapid surge in the older population in the coming years. Additionally, it identified the significance of additional randomized clinical trials, characterized by methodological rigor, to facilitate effective interventions in geriatrics and

gerontology. This approach aims to refine the profile of the older driver, engage in deliberations on and counsel regarding vehicular operation, and provide recommendations pertaining to driving restriction or cessation.

In Brazil, lacunae were observed concerning the productivity of studies, the utilization of specific assessments in the (re)licensing process, educational interventions for drivers and their families, and the training of a multidisciplinary team within traffic departments.

In this context, it is imperative for researchers in the fields of geriatrics, gerontology, and traffic specialists, in collaboration with traffic authorities, to conduct studies that provide specific assessments for older drivers. These studies should encompass rehabilitation when feasible, support for family/caregivers, and preparation for cessation of driving, with a focus on enhancing the self-awareness of the older individual.

Finally, the adaptation of licensing guidelines that address the social, economic, political, and educational specificities of the older driver, and the pursuit of a standardized, validated, and economically viable assessment that contributes to the identification of at-risk drivers, are important requisites globally.

AUTHORSHIP

- Danielle Félix Arruda Mourão conceived, developed the methodology, validated, and drafted the original manuscript;
- Paulo César de Almeida e Thalys Rebouças de Oliveira contributed to data curation and formal analysis;
- Alice Silva Osterne Ribeiro participated in data investigation and visualization;
- Eveline Alves Oliveira contributed to validation, drafting (original draft, revision, and editing); and,
- Maria Célia de Freitas supervised and assisted in the review and editing process of the text.

Edited by: Maria Helena Rodrigues Galvão





REFERENCES

- Occupational Therapy Practice Framework: Domain and Process—Fourth Edition. *The American Journal of Occupational Therapy*. 2020 Aug 31;74(Supplement_2):7412410010p1–87.
- Fraade-Blanar LA, Ebel BE, Larson EB, Sears JM, Thompson HJ, Chan KCG, et al. Cognitive Decline and Older Driver Crash Risk. *J Am Geriatr Soc*. 2018;66(6):1075–81.
- (Kit) Mitchell CGB. The Licensing of Older Drivers in Europe— A Case Study. *Traffic Injury Prevention*. 2008 Aug 15;9(4):360–6.
- Kulikov E. The Social and Policy Predictors of Driving Mobility Among Older Adults. *J Aging Soc Policy*. 2010; 23(1):1–18.
- Stav WB. Updated Systematic Review on Older Adult Community Mobility and Driver Licensing Policies. *Am J Occup Ther*. 2014;68(6):681–689.
- Brasil. Lei no 14.071, de 13 de outubro de 2020. Altera a Lei no 9.503, de 23 de setembro de 1997 (Código de Trânsito Brasileiro), para modificar a composição do Conselho Nacional de Trânsito e ampliar o prazo de validade das habilitações; e dá outras providências. 2020. Available at: <https://www.in.gov.br/web/dou/-/lei-n-14.071-de-13-de-outubro-de-2020-282461197>
- Clinician’s Guide to Assessing and Counseling Older Drivers. 4th ed. New York: The American Geriatrics Society; 2019.
- Urlings JHJ, Cuenen A, Brijs T, Lutin M, Jongen EMM. Aiding medical professionals in fitness-to-drive screenings for elderly drivers: development of an office-based screening tool. *Int Psychogeriatr*. 2018;30(8):1211–25.
- O’Connor MG, Kapust LR, Hollis AM. DriveWise: An Interdisciplinary Hospital-Based Driving Assessment Program. *Gerontol Geriatr Educ*. 2008;29(4):351–62.
- JBI Manual for Evidence Synthesis [Internet]. JBI; 2020. [Accessed in January 2023]. Disponível em: <https://jbi-global-wiki.refined.site/space/MANUAL>
- Tricco AC, Lillie E, Zarin W, O’Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Ann Intern Med*. 2018;169(7):467–73.
- Arksey H, O’Malley L. Scoping studies: Towards a Methodological Framework. *Int J Soc Res Meth*. 2005;8(1):19–32.
- Brasil. Lei n. 14.423, de 22 de julho de 2022. Altera a Lei n. 10.741, de 1º de outubro de 2003, para substituir, em toda a Lei, as expressões “idoso” e “idosos” pelas expressões “pessoa idosa” e “pessoas idosas”, respectivamente. *Diário Oficial da União*. 25 jul. 2022; Seção 1.
- JBI Levels of Evidence [Internet]. 2013 [Accessed in August 2023]. Available at: https://jbi.global/sites/default/files/2019-05/JBI-Levels-of-evidence_2014_0.pdf
- Hollis AM, Lee AKW, Kapust LR, Phillips LK, Wolkin J, O’Connor MG. The Driving Competence of 90-Year-Old Drivers: From a Hospital-Based Driving Clinic. *Traffic Inj Prev*. 2013;14(8):782–90.
- Lenardt MH, Lourenço TM, Betioli SE, Binotto MA, Sétlik CM, Barbiero MMA. Handgrip strength in older adults and driving aptitude. *Rev Bras Enferm*. 2023;76(1):e20210729.
- Unsworth CA, Baker A, Lannin N, Harries P, Strahan J, Browne M. Predicting fitness-to-drive following stroke using the Occupational Therapy – Driver Off Road Assessment Battery. *Disabil Rehabil*. 2018;41(15):1797–802.
- Dickerson AE, Molnar LJ, Eby DW, Adler G, Bedard M, Berg-Weger M, et al. Transportation and Aging: A Research Agenda for Advancing Safe Mobility. *Gerontologist*. 2007;47(5):578–90.
- Lovas J, Fereshtehnejad SM, Cermakova P, Lundberg C, Johansson B, Johansson K, et al. Assessment and Reporting of Driving Fitness in Patients with Dementia in Clinical Practice: Data from SveDem, the Swedish Dementia Registry. *J Alzheimers Dis*. 2016;53(2):631–8.
- Unsworth CA. Using Social Judgment Theory to Study Occupational Therapists’ Use of Information When Making Driver Licensing Recommendations for Older and Functionally Impaired Adults. *Am J Occup Ther*. 2007;61(5):493–502.
- Kapust LR, Weintraub S. To Drive or Not To Drive: Preliminary Results From Road Testing of Patients With Dementia. *Topics in geriatrics*. 1992;5(4):210–6.
- Unsworth CA, Russell K, Lovell R, Woodward M, Browne M. Effect of Navigation Problems, Assessment Location, and a Practice Test on Driving Assessment Performance for People with Alzheimer’s Disease. *J Alzheimers Dis*. 2019;67(3):1035–43.

23. Marshall S, Bédard M, Vrkljan B, Tuokko H, Porter MM, Naglie G, et al. Candrive - Development of a Risk Stratification Tool for Older Drivers. *J. Gerontol.* 2023;16.
24. Lenardt MH, Carneiro NHK, Binotto MA, Cechinel C, Lourenço TM, Sakai LM. Características dos idosos submetidos aos exames para a carteira de habilitação veicular. *Cogitare Enferm* [Internet]. 2017;22(1):1–10. Available at: <http://dx.doi.org/10.5380/ce.v22i1.48220>
25. Binotto MA, Lenardt MH, Carneiro NHK, Lourenço TM, Cechinel C, Rodríguez-Martínez M del C. Fatores associados à velocidade da marcha em idosos submetidos aos exames para habilitação veicular. *Rev Latino-Am Enfermagem.* 2019;27:e3138.
26. Lenardt MH, Binotto MA, Carneiro NHK, Lourenço TM, Cechinel C. Associação entre cognição e habilitação para direção veicular em idosos. *Av Enferm.* 2018;36(2):179–87.
27. Binotto MA, Lenardt MH, Carneiro NHK, Cechinel C, Lourenço TM, Bento PCB, et al. Associação entre cognição, velocidade da marcha e habilitação veicular em idosos. *Acta Paul Enferm.* 2021;34:eAPE00541.
28. Lenardt MH, Garcia ACKC, Binotto MA, Carneiro NHK, Lourenço TM, Cechinel C. Non-frail elderly people and their license to drive motor vehicles. *Rev Bras Enferm.* 2018;71(2):350–6.
29. Lenardt MH, Bettioli SE, Sakai LM, Carneiro NHK, Binotto MA, Moraes DC. Pré-fragilidade em idosos e a habilitação para direção de veículos automotores. *Rev Rene* [internet]. 2017;18(4):483–90. Available at: <http://periodicos.ufc.br/rene/article/view/20231>
30. Vasques AM, Borelli WV, Pinho MS, Portuguez MW. Verbal Learning as a predictor of risks of accidents in elderly drivers. *Arq Neuro-Psiquiatr.* 2022;80(1):30–6.
31. Vasques AM, Portuguez MW, Radaelli G, Gomes R. Avaliação cognitiva de condutores automotivos idosos: revisão integrativa. *Psico* [internet]. 2018;49(1):94–100. Available at: <https://revistaseletronicas.pucrs.br/ojs/index.php/revistapsico/article/view/27446>
32. World Population Prospects - Department of Economic and Social Affairs Population Division - United Nations [Internet]. [Accessed in February 2023]. Available at: <https://population.un.org/wpp/Graphs/Probabilistic/POP/60plus/900>
33. World Health Organization. Global status report on road safety 2018 [Internet]. Geneva: World Health Organization; 2018 [Accessed in March 2023]. 403 p. Available at: <https://apps.who.int/iris/handle/10665/276462>
34. Assessing fitness to drive for commercial and private vehicle drivers: medical standards for licensing and clinical management guidelines. 6th ed. Austrália: Austroads; 2022.
35. Krasniuk S, Crizzle AM, Toxopeus R, Mychael D, Prince N. Clinical Tests Predicting On-Road Performance in Older Drivers with Cognitive Impairment. *Can J Occup Ther.* 2023;90(1):44–54.
36. Eramudugolla R, Laird M, Black AA, Cameron ID, Wood JM, Anstey KJ. Inability of the Mini-Mental State Exam (MMSE) and high-contrast visual acuity to identify unsafe drivers. *Accid Anal Prev.* 2022;168:106595.
37. Fildes BN, Charlton J, Pronk N, Langford J, Oxley J, Koppel S. An Australasian Model License Reassessment Procedure for Identifying Potentially Unsafe Drivers. *Traffic Inj Prev.* 2008;9(4):350–9.
38. OECD. Ageing and Transport: Mobility Needs and Safety Issues [Internet]. OECD; 2001. [Accessed in January 2023]. Available at: <https://doi.org/10.1787/9789264195851-sum-en>
39. Stav W. CarFit: An Evaluation of Behaviour Change and Impact. *Br J Occup Ther.* 2010;73(12):589–97.
40. Castellucci HI, Bravo G, Arezes PM, Lavallière M. Are interventions effective at improving driving in older drivers?: A systematic review. *BMC Geriatr.* 2020;20:125.
41. Butler M, Brookland R, Shope JT, Kerse N, Connolly MJ. Medical fitness to drive assessment with older drivers: A qualitative study with general practitioners in New Zealand. *J Transp Health.* 2020;17:100856.
42. Scott TL, Liddle J, Pachana NA, Beattie E, Mitchell GK. Managing the transition to non-driving in patients with dementia in primary care settings: facilitators and barriers reported by primary care physicians. *Int Psychogeriatr.* 2019;32(12):1419–28.
43. Jett K, Tappen RM, Rosselli M. Imposed versus involved: Different strategies to effect driving cessation in cognitively impaired older adults. *Geriatr Nurs.* 2005;26(2):111–6.
44. Liddle J, Tan A, Liang P, Bennett S, Allen S, Lie DC, et al. “The biggest problem we’ve ever had to face”: how families manage driving cessation with people with dementia. *Int Psychogeriatr.* 2015;28(1):109–22.
45. Classen S, Monahan M, Auten B, Yarney A. Evidence-Based Review of Interventions for Medically At-Risk Older Drivers. *Am J Occup Ther.* 2014;68(4):e107–14.
46. Neilson D, Chacko E, Cheung G. Assessing driving fitness in dementia: a challenge for old age psychiatrists. *Australas Psychiatry.* 2019;27(5):501–5.



Self-esteem and aesthetics in the perception of older adults from Social Assistance Reference Centers

Olivia Figueira¹ 
Carla Corradi Perini² 
Anor Sganzerla² 
Paulo Sergio Marcellini¹ 

Abstract

Objective: To analyze the perception of older adults regarding their body image and self-esteem. **Method:** A qualitative, exploratory, and descriptive study conducted with 28 older adults in the Social Assistance Reference Centers of Araucária, Paraná, Brazil. A structured interview with a questionnaire comprising 10 questions addressing feelings about aesthetics in aging and its repercussions on self-esteem was administered. Data analysis was performed using the IRAMUTEQ® software. **Results:** The analysis of perception regarding aesthetics and self-esteem in aging resulted in 5 classes: Class 1 (19.8%) "Self-esteem vs. self-image", Class 2 (20.7%) "Feelings and sensations experienced", Class 3 (20.7%) "Aspects beyond appearance influencing self-esteem", Class 4 (18.1%) "Reasons for engaging in aesthetic care", and Class 5 (20.7%) "Types of interventions and aesthetic care". Elevated self-esteem was found in an economically vulnerable population. Many older adults reported changes in how they are treated with aging; however, this was not solely perceived negatively. **Conclusion:** Despite societal promotion of a beauty standard, older adults can live satisfactorily with high self-esteem without being negatively influenced.

Keywords: Aging. Older adult. Self-esteem. Aesthetics.

¹ Universidade Federal do Estado do Rio de Janeiro (UNIRIO), Programa de Pós-Graduação em Enfermagem e Biociências. Rio de Janeiro, RJ, Brasil.

² Pontifícia Universidade Católica do Paraná (PUCPR), Programa de Pós-Graduação em Bioética. Curitiba, PR, Brasil.

Research funding: We thank the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) for funding the publication.

The authors declare that there is no conflict in the conception of this work.

Correspondence
Olivia Sandes Andrade Figueira Duarte
olivia2407@yahoo.com.br

Received: August 9, 2023
Approved: November 9, 2023

INTRODUCTION

Aging is a natural process in which individuals are susceptible to bodily changes and the effects of socio-cultural influences, including predetermined aesthetic standards¹. Among the influential factors, media and social networks play a significant role. These platforms filter life experiences, present, and impose an aesthetic ideal of youth and beauty, thereby rendering aging an invisible reality².

Despite socially determined aesthetic standards, Adela Cortina³ asserts that "it can never be allowed for a group, no matter how minority, to restrict the individual freedoms of its members, forcing them to maintain a lifestyle they do not desire". The ability to resist socially determined aesthetic standards is associated with self-esteem. Self-esteem is understood as the consideration or feeling that the individual has about oneself, how one sees oneself, and how one feels⁴. Analyzing and discussing the relationship between self-esteem and the aesthetics of aging from the perspective of those who are aging is crucial, recognizing that aging is not experienced uniformly among older adults, as many reject it, feeling undervalued.

Among minority groups, those living in poverty stand out. According to data from the Brazilian Federal Government in 2020, 69% of older adults lived on an income of up to two minimum wages⁵. Poverty in this age group is a significant challenge, as fewer financial resources correlate with increased health fragility and dependency in older individuals. Poverty not only compromises material and financial needs but also encompasses other dimensions of older adults, including the social, cultural, and relational aspects in general. This can have repercussions on various levels, including the existential dimension, potentially leading to low self-esteem⁶. In this study, poverty is a reality for the participating population, with economically vulnerable older individuals being considered.

According to Adela Cortina⁷, full citizenship requires a connection with one's peers, an acceptance of differences, as it "integrates a legal status, a moral status, and an identity, through which a person knows and feels belonging to a society". The author further

states that identity is not something given; rather, it is something negotiated through social struggles that make recognition a reality. However, mere recognition of the other is not sufficient; it is essential for the individual to choose and define their own identity⁸. In a modern society that aspires to equality among its members, each individual should be empowered to determine which affiliations they consider most defining. In this context, the aim of this study is to analyze the perception of older individuals regarding their body image and self-esteem.

METHOD

A qualitative, exploratory, and descriptive research was conducted with 28 older individuals registered at two Centers of Social Assistance Reference (Centros de Referência de Assistência Social - CRAS): Industrial and Califórnia, in Araucária, a municipality in the state of Paraná. The CRAS is a unit of the Unified Social Assistance System (Sistema Único de Assistência Social - SUAS) responsible for providing services, programs, and benefits aimed at preventing situations of risk and strengthening bonds in areas of social vulnerability.

The sample was established by convenience, a non-probabilistic and non-random sampling technique employed to create samples based on ease of access. Inclusion criteria encompassed individuals of advanced age, with a minimum age threshold of 60 years and no specified maximum age limit, of both genders, affiliated with one of the CRAS facilities in Araucária. Exclusion criteria were applied to preclude individuals with any pre-existing cognitive limitations that might impede comprehension and response to the questionnaire. Forty older individuals were approached as they sought assistance or engaged in activities at the CRAS. Twelve individuals declined participation, culminating in a final sample size of twenty-eight.

The qualitative approach provides three possibilities: documentary research, case study, and ethnography⁹. This work employed what is known as a case study, as it adopts an exploratory and descriptive focus, aiming to demonstrate the multiplicity of dimensions present.

Given the qualitative nature of the research, aimed at capturing the multiple dimensions of a phenomenon, the concept of saturation was not employed. Instead, the objective was to substantiate the research comprehensively and in-depth, thereby providing a thorough exploration. According to Minayo¹⁰, in qualitative research, the certainty of discovering the internal logic of the study's object – which is also a subject – should prevail in all its connections and interconnections.

The Consolidated Criteria for Reporting Qualitative Research (COREQ) guide, in its Brazilian version¹¹, has been employed since the project's planning phase. This tool, created by the Pan American Health Organization (PAHO) and the Equator Network, aims to establish indicators for the planning, execution, and reporting of qualitative research. It comprises 32 items across three domains: characterization and qualification of the research team, study design, and analysis of results¹¹.

The research technique employed was structured interviews with audio recording. The research instrument consisted of eight sociodemographic questions and an interview script comprising 10 questions addressing feelings regarding aesthetics

in aging and its repercussions on self-esteem. The interview script utilized for the interviews is presented in Chart 1.

The interviews were conducted between July 2022 and March 2023 by an auxiliary researcher who functions as a psychologist in the CRAS. The auxiliary interviewer underwent specific training to ensure the impartiality of responses and to adhere strictly to the predetermined script. Impartiality was monitored through the audio recordings of the interviews. The interviews took place in a private setting, with no individuals present other than the participant and the interviewer. The interview audio recordings were captured in MP4 format, with a duration ranging from 4 to 9 minutes. Subsequently, the interviews were transcribed in their entirety, and a cleaning process was undertaken, involving the correction of grammatical errors and the transformation of figurative language into textual form, all while preserving the content of the narratives. It was imperative to listen to the interviews at least three times to ensure comprehensive assimilation of all data for subsequent discussion. For data analysis, the open-source software IRAMUTEQ® (Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires) was employed, enabling statistical analyses on textual corpus¹².

Chart 1. Structured interview script conducted. Araucária, Paraná, 2023

1) Share your thoughts on aesthetic interventions undertaken by individuals as they age (such as hair coloring, aesthetic treatments, cosmetic procedures, plastic surgery, etc.).	6) What aspects of your current appearance bother you the most, and what do you appreciate the most?
2) Do you engage in any form of self-care or aesthetic intervention? If affirmative, could you specify the nature of these practices?	7) Are there aesthetic practices you engage in because you feel obligated or demanded by others?
3) Do you believe that the aesthetic care practices you undertake for yourself are driven by personal preference or societal expectations?	8) How do you perceive yourself when looking in the mirror?
4) How do you currently perceive your appearance? Please elaborate on your feelings.	9) Would you describe yourself as confident in terms of your appearance? Please explain.
5) Does your appearance influence how you are treated by people (family, friends, strangers)? In what ways?	10) How do you perceive your self-esteem as you age? Please explain.

Source: Figueira, 2023.

The data presented in the Descending Hierarchical Classification (DHC) are graphical outcomes generated by IRAMUTEQ® from all grouped interviews (textual corpus). In the DHC, various aspects are analyzed, including the number of texts, text segments, distinct forms, occurrence frequency, average frequency of forms, number of classes, and retention of text segments¹². It delineates classes, with each class comprised of vocabulary that is both similar within itself and different from other classes. Distances and proximities are computed through chi-square tests (χ^2). Based on this analysis, the software organizes the data into a dendrogram.

Participation authorization was secured through the Informed Consent Form (ICF) based on Resolutions 466/2012 and 510/2016 of the National Health Council¹³. The identity of participants was safeguarded, with names modified to initials (e.g., MLS). It was explicitly communicated that participants had the freedom to terminate the interview at any point or choose not to respond to specific questions without facing any inquiry from the interviewer. The research project received approval from the Research Ethics Committee under protocol number 5.445.753.

DATA AVAILABILITY

The entire anonymized dataset supporting the findings of this study has been made available on OPENICPSR and can be accessed at <https://www.openicpsr.org/openicpsr/project/194962/version/V2/view>.

RESULTS AND DISCUSSION

As this study is qualitative in nature, results and discussion will be presented concomitantly.

Characterization and sociodemographic distribution of participants

The sociodemographic characteristics of the participants are illustrated in Table 1.

According to Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e

Estatística - IBGE)¹⁴, the current population of Brazil is 203,062,512 people, and in the state of Paraná, 11,443,208 people reside, with 11% of this population comprising older adults. A population with low educational attainment was identified, as expected, given the prevalence of illiteracy, which currently affects 6% of the Brazilian population, particularly within economically vulnerable classes.

In this study, data congruent with what researchers refer to as the "Feminization of Aging"¹⁵ were identified. The reasons behind this phenomenon in the Brazilian population are not entirely clear; however, it is suggested that it may result from various factors, including a higher proportion of women in the Brazilian population and a longer life expectancy for women compared to men.

Regarding housing, 43% live with family, while 46% live alone. The fact that a significant portion resides independently suggests that these older adults exhibit good autonomy and maintain their functionality. On the other hand, living with family does not necessarily imply a loss of autonomy.

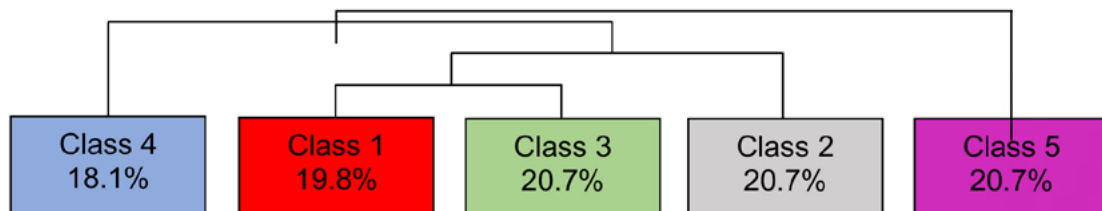
Analysis of the perception of older adults regarding their self-image and self-esteem

The IRAMUTEQ® software organized data and identified 278 texts (interviews from 28 participants, each comprising 10 questions, with two questions left unanswered), 327 segments of text (ST), and 7,375 occurrences (words, terms, or expressions). These occurrences were further categorized into 572 active forms, 118 supplementary forms, and 5 class numbers. Of the 327 classified text segments, 232 were deemed usable, corresponding to 70.95%.

From the analysis conducted using IRAMUTEQ®, thematic groups of subtopics were formed, emerging from the statements of the interviewees that gave rise to the following classes: 1. "Relationship between Self-Esteem and Self-Image," 2. "Feelings and sensations experienced," 3. "Aspects beyond appearance influencing self-esteem," 4. "Reasons for engaging in aesthetic care," and 5. "Types of interventions and aesthetic care," as illustrated in Figure 1.

Table 1. Sociodemographic characteristics of participants (N=28). Araucária, PR, 2023.

Variables	Number	Percentage
Gender		
Female	25	89
Male	3	11
Age group (years)		
60-64	7	25
65-69	13	46
70-74	6	21
75-79	1	4
80-89	1	4
90 and above	0	0
Living arrangements		
Spouse	3	11
Family	12	43
Alone	13	46
Others	0	0
Marital status		
Single	2	8
Married; common-law marriage	6	21
Separated; divorced	6	21
Widowed	14	50
Education		
Illiterate	10	35
Incomplete Elementary Education	15	54
High School	3	11
Paid employment		
Yes	4	14
No	24	86
Trabalho voluntário		
Yes	3	11
No	25	89

**Figure 1.** Dendrogram of the Descending Hierarchical Classification

Class 1: Relationship between Self-esteem and self-image; Class 2: Feelings and sensations experienced; Class 3: Aspects beyond appearance that influence self-esteem; Class 4: Reasons for engaging in aesthetic care; Class 5: Types of interventions and aesthetic care.

Source: IRAMUTEQ® 7.2 Software, 2023.

Class 1: Relationship between self-esteem and self-image

Authors describe that older adults may exhibit low self-esteem due to dissatisfaction with their bodies, linked to physical, functional, and social losses^{4,16,17}. In this study, it was observed that older adults refer to their health as a significant determinant of self-esteem.

The connection between health and self-esteem became apparent in statements such as:

"I used to enjoy dressing up..., but not anymore; I am very ill, facing many health problems" (Question 01, Response 15);

"When I feel good, it's because I know I am in good health" (Question 09, Response 28);

"My self-esteem is good... I take medicine to sleep, and I don't need to take it" (Question 10, Response 08).

Self-image can interfere with self-esteem due to a stigmatizing and prejudiced view of the individual aging in relation to their own body¹⁸:

"I feel ugly; I look different after aging" (Question 04, Response 15);

"I see that I don't have a good appearance; I am too old, I am worn out" (Question 04, Response 21).

The presence of physical and social problems generates insecurity, negatively impacting self-esteem. Low educational attainment, prevalent in various regions of Brazil, compromises access to health education and social mobilization, thereby influencing the potential for improved quality of life and, conceivably, self-esteem¹⁹.

Twenty-one older adults were found to feel good about themselves, while only seven do not feel good about their appearance. Among these seven, statements such as the following were observed:

"I don't feel good; if I could, I would change" (Question 4, Response 09);

Despite the negative perception of some, the majority maintains a positive outlook:

"I feel good as I am, naturally" (Question 4, Response 02);

"I think I am beautiful; I am happy" (Question 4, Response 05);

"I live very well with my age; I love myself a lot and enjoy dressing up" (Question 4, Response 06);

The majority of the interviewees reported feeling good (21 out of 28), as indicated by statements such as:

"My self-esteem is high; I don't let myself be discouraged" (Question 10, Response 02);

"My self-esteem is good; I find myself beautiful, and my body is also appropriate for my age" (Question 10, Response 04).

It can be observed that, regardless of age, a significant number of them feel good, acknowledging the aging process, with some expressing a desire or even undergoing aesthetic care, yet without attempting to conceal the aging. These individuals are aware of the passage of time, wrinkles, associated clinical comorbidities, and they confront them. This outcome aligns with findings from other studies reviewed by Yokomizo and Lopes²⁰, where older adults seek not to victimize themselves in the face of the inevitability of aging and accept old age without bitterness over the end of youth.

However, older adults with impaired functionality tend to have low self-esteem:

"My self-esteem is not so good because I am becoming debilitated... I am slower" (Question 10, Response 07).

Dissatisfaction with self-image was observed to be directly associated with the social and economic vulnerability profile of this population:

"I feel bad when I go out with other people; I want to eat in secret" (Question 10, Response 01);

"I don't have all my teeth, so I am ashamed to eat in front of others" (Question 06, Response 01).

It is crucial to understand that every human being possesses a narrative identity, shaped by their history, the passage of years, and the accumulation of experiences. This implies that one cannot comprehend an individual without grasping their history, life stories, as these constitute the key to their worldview, context, and current state²¹. The marks of time and the aesthetics of aging are these stories, lived experiences, and encounters. When society imposes alterations to the appearance of older adults, it suggests an attempt to conceal their genuine life experiences.

Class 2: Experienced feelings and sensations

In the pursuit of comprehending the self-esteem of older adults, varied sentiments and sensations were observed. Distinct manifestations of coping mechanisms were discernible, a phenomenon delineated by the concept of emotional intelligence as the stress-coping methodology employed by each individual²².

Among the various strategies employed to cope with the aging process, diverse approaches to acceptance have been observed. Many older individuals establish a connection with religion, wherein their relationship with God assumes a pivotal role. In the described interaction with the divine (and/or God), numerous individuals express an acceptance of their current situation, attributing it to the divine will—a form of religious coping. Pargament²³ has defined religious coping as the utilization of religious/spiritual strategies to navigate situations of stress and suffering.

Religious coping manifests in the discourse of some, as evidenced by their statements:

"I am old, and I feel that I am closer to God" (Question 04, Response 08);

"I feel beautiful because I am evangelical, and I feel beautiful before God" (Question 04, Response 26).

Sixteen older individuals were identified as perceiving a change in the treatment they receive based on their appearance, while twelve did not sense

such a change. However, not all who observed the change regarded it as negative:

"My appearance changes how I am treated; I feel that I am viewed positively" (Question 5, Response 03);

"I receive compliments because of my age, and it makes me very happy" (Question 5, Response 06);

"I believe I am treated well because I am tidy and cheerful" (Question 5, Response 17).

Some perceive this change negatively:

"Some people say I am old, make jokes" (Question 5, Response 08);

"It does change; people say I look worn out" (Question 5, Response 13).

Among the 12 older individuals who do not perceive any change in treatment, expressions such as the following can be noted:

"It doesn't change; people like me just the way I am" (Question 5, Response 12);

"It doesn't change; everyone treats me normally" (Question 5, Response 24);

"Everyone treats me well; no one cares about my appearance" (Question 5, Response 28).

Class 3: Aspects beyond appearance that influence self-esteem

The relationship between self-esteem and aesthetics was prominently highlighted. However, other significant factors for this population's self-esteem were identified, such as family relationships and autonomy. In articulating their self-esteem, numerous older individuals addressed autonomy in two dimensions: functional autonomy and as a bioethical principle.

Functional autonomy was mentioned:

"I can still go out; I come to participate in activities" (Question 04, Response 02);

"I am active, I do various tasks... I don't stay locked up at home" (Question 04, Response 25);

"I still have strength and autonomy; I feel well" (Question 06, Response 07).

Functional autonomy in older individuals is extensively discussed in the literature due to its paramount importance during this life stage. The significance of maintaining autonomy as a means to promote quality of life in aging has been well-established²⁴, along with the preservation of functional capacity for healthy aging²⁵. A study conducted in Fortaleza, with 821 individuals aged 60 to 100 years, found that higher income is associated with a lower likelihood of illness¹⁹. Therefore, social and health inequalities require increased attention to achieve equity in care, ensuring that older individuals in economically vulnerable situations can maintain their functional autonomy¹⁹.

Autonomy as a bioethical principle is recognized as a right for older individuals, both under the Elderly Statute²⁶ and the Universal Declaration on Bioethics and Human Rights (UDBHR), which stipulates that no one should be discriminated against or stigmatized for any reason, under penalty of "violation of human dignity, human rights, and fundamental freedoms"²⁷.

The importance of preserving the decision-making regarding one's own life is evident in the statements:

"I do what I want and because I want to, not because I'm forced to" (Question 07, Response 22);

"I don't accept orders from anyone, not even from my children; I am the one in control of my life" (Question 07, Response 25);

"I don't like being told what to do; I don't like being told whether I can or cannot do something just because I am old" (Question 06, Response 24).

Another aspect valued by older individuals is the relationship with family:

"The children keep telling their mothers that they are old, and that's not nice... because mothers are aware that they are aging; there's no need to keep talking about it" (Question 05, Response 18).

It is understood that the way an older individual has built their relationships has a direct influence on how they will experience them in old age.

Class 4: Reasons for engaging in aesthetic care

The majority of the interviewees state that they do or do not undertake certain care based on their personal desires. This aligns with research conducted with 50 older women aiming to assess the motivation for undergoing aesthetic surgery, which observed that those who underwent surgery cited physical discomfort and dissatisfaction with self-image as the primary motivators²⁸.

In the discourse on aesthetic interventions, several motives for engaging in aesthetic care can be identified:

"I think it's nice for those who don't want to show the signs of aging and to appear younger" (Question 01, Response 18);

"The aesthetic care I take for myself is because people expect it from me; if I don't groom myself, I don't feel good in the midst of others" (Question 03, Response 01);

"People expect this from me; my boyfriend even said I should dye my hair" (Question 03, Response 15).

Exacerbated by societal pressure for beautification, those lacking financial resources may experience feelings of shame or guilt²⁰:

"I feel too old; I wish I had the money to undergo plastic surgery" (Question 01, Response 21);

"I would like to change, but since I don't have the money, I have to stay this way" (Question 04, Response 09).

Low self-esteem and social rejection may underlie the emergence of feelings of loneliness, which can be experienced with anguish. This is because older individuals may feel alone despite being surrounded by others, sensing a lack of support, particularly in the emotional realm²⁹.

As a society, it must be understood that ethics opposes indifference, and an ethical society is obligated to care for older adults who are the most vulnerable. Although many older women feel free to choose their appearance, some authors suggest that the association of aging with illnesses has resulted in anti-aging practices for women as a constant construction of gender identity²⁰.

In associating aging with illness, they seek aesthetic procedures with the aim of disguising age. Women appear to bear the stigma of aging more acutely, falling victim to the heightened concern for physical appearance, wherein the care for bodily aesthetics becomes synonymous with happiness, and the body is elevated to cultural, symbolic, social, and economic capital³⁰.

Nevertheless, recent research has indicated that many older women, regardless of social class, perceive old age as a period of heightened freedom³¹. This enthusiasm may be one of the reasons why a segment of this population manages to break free from social impositions, expressing their aging in a manner that suits them.

Despite the stigma, there appears to be a shift in the perception of old age. As women break free from these impositions, they begin to find fulfillment in the construction of life rather than appearance, and they start to occupy spaces that were previously vacant, such as cultural and recreational domains³²:

"I have never liked to stretch my eyes, stretch my forehead, stretch my neck; I want to be who I am" (Question 03, Response 04);

"I like to be natural" (Question 03, Response 07).

Culture possesses a transformative force and establishes behaviors regulated by norms, sustained by a set of values that legitimize and render them comprehensible, institutionalized⁸. However, culture is not absolute; it is born, transforms, and can perish when it lacks the capacity to respond to new challenges presented by its surroundings⁸.

Category 5: Types of Interventions and Aesthetic Care

Aging wears a feminine face; women are more numerous and live longer³³. For this reason, it is necessary to provide a social, community, and personal response of care, attention, and responsibility. Ethical consideration of older women necessitates contemplating care as a response.

Older women were more numerous in this study and were able to express their perception regarding the need to modify or accept aging. The premise is that the stereotype may not only be linked to prejudice but can also be understood as a widespread belief resistant to changes or new information about personal attributes of a group³⁴. The majority of respondents reported coping well with these characteristics:

"Only face cream for me and never dye my hair" (Question 02, Response 05);

"I like makeup, painting my nails" (Question 02, Response 06);

Among the 28 interview participants, 19 affirmed not dyeing their hair.

Older women placed significant importance on the use of cosmetics and makeup, even those who claimed not to dye their hair, indicating a concern for appearance that may not be directly linked to conveying youthfulness. Despite female aging being rooted in persistent patterns of inequality, there is an observable shift in the mindset of these women who take on the role of protagonists in their lives.

In literature, philosophers have also liberated themselves from social constraints, matured in their works, and produced significant texts after the age of 60. At the age of 66, Immanuel Kant published *Critique of Judgment* and *Religion within the Bounds of Bare Reason*. After the age of 60, Plato produced significant works such as *Sophist*, *Statesman*, *Timaeus*, *Crito* and *Philebus*, the latter completed at the age of 74. Through their examples, they demonstrate the greatness that can be found in old age. Cicero also speaks of the 'art of aging,' as the skill to find pleasure in all stages of life.

Given that this study employed a convenience sampling method, taking into account the availability of individuals to participate in the research, it is acknowledged that the participants and results may not necessarily represent a representative sample of the entire Brazilian population.

CONCLUSIONS

In this study, a high level of self-esteem was found within an economically vulnerable population. Many older individuals perceived changes in how they are treated due to aging. However, these changes are not solely perceived negatively. Some recognize benefits in appearing their age, such as respect and care from family and friends. A resilient population was observed, accepting aging and employing their resources to cope with it.

With the aging of the population, more studies on self-esteem and aesthetics in aging are necessary. To truly establish a just society where older individuals, have their citizenship respected, it is imperative to include them in the discussion.

This research identified an autonomous population of older individuals, aware of their

achievements, and capable of coping with the losses and limitations associated with aging.

AUTHORSHIP

- Olivia Figueira: conception and design, article writing, responsible for all aspects of the work, ensuring that issues related to the accuracy or integrity of any part of the work are resolved;
- Carla Corradi Perini: critical review; approval of the version to be published;
- Anor Sganzerla: critical review;
- Paulo Sergio Marcellini: critical review; approval of the version to be published.

ACKNOWLEDGEMENTS

We thank CAPES for financing the publication and translation of the article. We thank the CRAS of Araucária who allowed and made the research viable, the volunteer participants, and the assistant researcher.

Edited by: Marquiony Marques dos Santos

REFERENCES







1. Batistoni SST, Neri AL. Percepção de classe social entre idosos e suas relações com aspectos emocionais do envelhecimento. *Psicol em Pesqui* [Internet]. 2007;1(2):3–10. Available at: <https://periodicos.ufjf.br/index.php/psicologiaempesquisa/article/view/23687>
2. Lumbreras S. El ideal de un hombre que esquivo al tiempo: Tecnología e vejez. In: Usanos RA, editor. *Bioética para una sociedad envejecida*. Madrid: Comillas - Universidad Pontificia; 2022. p. 179–93.
3. Cortina A. *Cidadãos do Mundo por uma teoria da cidadania*. 4a ed. Madrid: Editora Loyola; 2005. 153 p.
4. Copatti SL, Kuczmainski AG, Sá CA De, Ferretti F. Imagem corporal e autoestima em idosos: uma revisão integrativa da literatura. *Estud interdisciplinares sobre Envelhec* [Internet]. 2017;22(3). Available at: <https://www.seer.ufrgs.br/RevEnvelhecer/article/view/60583>
5. IDOSOS E FAMÍLIA NO BRASIL Fatos e Números [Internet]. 2020. Available at: <https://www.gov.br/mdh/pt-br/navegue-por-temas/observatorio-nacional-da-familia/fatos-e-numeros/idosos-e-familia-no-brasil.pdf>
6. Fernandes AI. Pobreza e pessoas idosas: A dimensão subjetiva e existencial do fenômeno. *Rev Ibero-Americana Saúde e Envelhec* [Internet]. 2015;1(2):156. Available at: http://www.revistas.uevora.pt/index.php/saude_envelhecimento/article/view/59
7. Cortina A. *Cidadãos do Mundo por uma teoria da cidadania*. Madrid: Editora Loyola; 2005. 139 p.
8. Cortina A. *Cidadãos do Mundo por uma teoria da cidadania*. 4a ed. Madrid: Edições Loyola; 2005.
9. Godoy AS. Pesquisa qualitativa: tipos fundamentais. *Rev Adm Empres* [Internet]. 1995;35:20–9. Available at: <https://www.scielo.br/j/rae/a/ZX4cTGqYfVhr7LvVyDBgdb/?format=pdf&lang=pt>

10. Minayo MC de S. Amostragem e saturação em pesquisa qualitativa: consensos e controvérsias. *Rev Pesqui Qual* [Internet]. 2017;5(7):1–12. Available at: <https://editora.sepq.org.br/index.php/rpq/article/view/82>
11. Dos Santos Souza VR, Marziale MHP, Silva GTR, Nascimento PL. Tradução e validação para a língua portuguesa e avaliação do guia COREQ. *Acta Paul Enferm* [Internet]. 2021;34:eAPE02631. Available at: <https://www.scielo.br/j/ape/a/sprbhNSRB86SB7gQsrNnH7n/>
12. Camargo BV, Justo AM. Tutorial para uso do software de análise textual IRAMUTEQ [Internet]. 2013. Available at: www.r-project.org
13. BRASIL CNDS. Ministério da Saúde [Internet]. 2012. Available at: <http://conselho.saude.gov.br/>
14. IBGE - Instituto Brasileiro de Geografia e Estatística. Pesquisa Nacional por Amostra de Domicílios Contínua - PNAD [Internet]. 2020. Available at: <https://biblioteca.ibge.gov.br/>
15. Cepellos VM. Feminização do envelhecimento: um fenômeno multifacetado muito além dos números. *Rev Adm Empres* [Internet]. 2021;61(2):e20190861. Available at: <http://www.scielo.br/j/rae/a/9GTWvFfzYFzHKyBhqGPc4j/>
16. Guimarães JS, Lima AP, Cardoso FB. Efeito da prática do Tai Chi Chuan na autoestima e autoimagem de idosos. *Rev Bras Prescrição E Fisiol Do Exerc* [Internet]. 2017;11(71):952–9. Available at: <http://www.rbpfex.com.br/index.php/rbpfex/article/view/1317>
17. Santos I, von Humboldt S, Leal I. O efeito da imagem corporal e da satisfação conjugal no ajustamento ao envelhecimento dos idosos. *Psicol Saúde Doença* [Internet]. 2020;21(01):111–6. Available at: https://www.researchgate.net/publication/339135967_O_efeito_da_imagem_corporal_e_da_satisfacao_conjugal_no_ajustamento_ao_envelhecimento_The_effect_of_physical_image_and_marital_satisfaction_in_the_adjustment_to_aging_of_older_adults
18. Silva MR da, Rodrigues LR. Conexões e interlocuções entre autoimagem, autoestima, sexualidade ativa e qualidade de vida no envelhecimento. *Rev Bras Enferm* [Internet]. 2020;73(3). Available at: https://www.researchgate.net/publication/344367369_Connections_and_interlocations_between_self-image_self-esteem_active_sexuality_and_quality_of_life_in_ageing
19. Oliveira anyne de S, Freitas SKS de, Vilar NBS, Saintrain SV, Bizerril DO, Saintrain MV de L. Influência da renda e do nível educacional sobre a condição de saúde percebida e autorreferida de pessoas idosas. *J Heal Biol Sci* [Internet]. 2019;Revisado(4):395–8. Available at: <https://periodicos.unichristus.edu.br/jhbs/article/view/2343>
20. Yokomizo P, Lopes A. Aspectos socioculturais da construção da aparência no envelhecimento feminino: uma revisão narrativa. *Rev Kairós-Gerontologia* [Internet]. 2019;22:285–317. Available at: <https://revistas.pucsp.br/index.php/kairós/article/view/2176-901X.2019v22iEspecial26p285-317>
21. Torralba F. Hacia una bioética del cuidado. In: Usanos RA, editor. *Bioética para una sociedad envejecida*. Madrid: Comillas - Universidad Pontificia; 2022. p. 123–42.
22. Fteiha M, Awwad N. Emotional intelligence and its relationship with stress coping style. *Heal Psychol Open* [Internet]. 2020;7(2):2055102920970416. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7656878/>
23. Gomes MR, Fabiana E, Escudero T, Fanini L, Pinheiro E, De Macedo N. Envelhecimento e Espiritualidade: o Papel do Coping Espiritual/Religioso em Idosos Hospitalizados [Internet]. Vol. 23, *Interação em Psicologia*. 2019 Ago. Available at: <https://revistas.ufpr.br/psicologia/article/view/65381>
24. De Moraes FL, Correa P, Coelho WS. Avaliação da autonomia funcional, capacidades físicas e qualidade de vida de idosos fisicamente ativos e sedentários. *Rev Bras Prescrição E Fisiol Do Exerc* [Internet]. 2018;12(74):297–307. Available at: <http://www.rbpfex.com.br/index.php/rbpfex/article/view/1398>
25. Vieira JNL, Rego AS, Vieira AM de A, Abreu BRS. Avaliação da autonomia funcional em idosos comunitários. *Rev Investig Biomédica* [Internet]. 2018;10(1):6–12. Available at: <http://www.ceuma.br/portalderevistas/index.php/RIB/article/view/208>
26. Ministerio da Saude B. Estatuto do Idoso 3a edição 2a reimpressão [Internet]. Brasil; 2013 p. 70. Available at: https://bvsms.saude.gov.br/bvs/publicacoes/estatuto_idoso_3edicao.pdf
27. Mello GA, Paranhos D, Albuquerque A. Direitos humanos dos pacientes como instrumentos bioéticos de proteção das pessoas idosas. *Cad Ibero-Americanos direito Sanit* [Internet]. 8(1):53–64. Available at: <http://dx.doi.org/10.17566/ciads.v8i1.507>
28. Spadoni-Pacheco LM, Carvalho GA. Qualidade de vida e autoestima em idosas submetidas e não submetidas à cirurgia estética. *Rev Bras Cir Plástica* [Internet]. 2018;33(4):528–35. Available at: <http://www.rbcp.org.br/details/2218/pt-BR/qualidade-de-vida-e-autoestima-em-idosas-submetidas-e-nao-submetidas-a-cirurgia-estetica>
29. Azeredo Z de AS, Afonso MAN. Solidão na perspectiva do idoso. *Rev Bras Geriatr e Gerontol* [Internet]. 2016 ;19:313–24. Available at: <https://www.scielo.br/j/rbgg/a/shGrnPpJKBjYwf3rQCM8skM/>

30. Romanssini SF, Scortegagna H de M, Pichler NA. Estética e felicidade na percepção de idosas usuárias de produtos de beleza. *Rev Bras Geriatr e Gerontol* [Internet]. 2020;23(3). Available at: <https://www.scielo.br/j/rbgg/a/zgQ5d56jvTqpc4jszbn4mvF/abstract/?lang=pt>
31. Egydio L. Do Feminismo à Feminização: gênero e envelhecimento em uma sociedade em transformação. *Rev Portal Divulg*. 2017;(54).
32. de Oliveira ZA, Criado GF, Domingues R de S. A percepção do próprio envelhecimento. *Rev do Inst Paul Geriatr e Gerontol* [Internet]. 2012 [cited 2023 Apr 3];1(1):42–7. Available at: https://www.saude.sp.gov.br/resources/ipgg/revista/revista_do_instituto_paulista_de_geriatria_e_gerontologia_n_1_-_2012.pdf#page=42
33. García MCM. La feminización de la ancianidad. Vejez e género. In: Usanos RA, editor. *Bioética para una sociedad envejecida*. Madrid: Comillas - Universidad Pontificia; 2022. p. 161–78.
34. Fort MC, Skura I, Brisolara C. Convenções corporais e o medo de envelhecer: Ideais de juventude e beleza midiáticos versus aceitação pessoal e social da imagem real. *Rev Obs* [Internet]. 2017;3(1):183–204. Available at: <https://sistemas.uft.edu.br/periodicos/index.php/observatorio/article/view/3071>
35. Beauvoir S de. *A velhice*. 2.ed. Rio de Janeiro: Nova Fronteira; 2018.



Postural balance and associated factors with the fall risk assessed in older adults with type 2 diabetes mellitus

Adriana Guedes Carlos¹ 
Vanessa da Nóbrega Dias² 
Monica Rodrigues Perracini³ 
Flávia Doná⁴ 
André Gustavo Pires Sousa⁵ 
Juliana Maria Gazzola¹ 

Abstract

Objective: Identify clinical-functional factors associated to the risk of falls, assessed by Mini-BESTest in older adults with type 2 diabetes mellitus (T2DM). **Method:** This cross-sectional study. A total of 145 older adults aged ≥ 60 years were evaluated through sociodemographic variables (sex, age group, married, education level, general health status hearing and vision), Mini-BESTest, Mini-Mental State Examination (MMSE), Geriatric Depression Scale (GDS-15) and dual-task Timed Up and Go Test (TUG). Multiple logistic regression model was used. **Results:** The sensory orientation domain presented the highest average score, followed by the gait stability, anticipatory postural adjustments and postural responses domains. Factors associated to the risk of falls in older adults are: poor/very poor visual perception OR 3.40 (1.50-7.72); have respiratory diseases OR 8.00 (1.32-48.46); feeling dizzy OR 2.53 (1.10-5.80); and TUGT (dual task) time equal to or greater than 13.5 seconds OR 3.31 (1.03-10.64). **Conclusion:** Older adults in this study presented impaired postural balance, mainly in the postural responses domain. The knowledge of the factors associated with the risk of falls in older adults with T2DM allows for better guidance in prevention, assessment and intervention, in order to minimize the occurrence of falls and maintain or optimize postural balance. Several factors influenced this outcome, such as overweight, low physical activity and education, several comorbidities, polypharmacy, T2DM diagnosis for more than ten years, negative perception of general health and vision, and depressive symptoms.

Keywords: Older Adults. Accidental Falls. Postural Balance. Diabetes Mellitus. Health Evaluation.

¹ Universidade Federal do Rio Grande do Norte, Departamento de Fisioterapia. Natal, RN, Brasil.

² Faculdade Nova Esperança, Departamento de Fisioterapia. João Pessoa, Paraíba, Brasil.

³ Universidade Cidade de São Paulo, Departamento de Gerontologia. São Paulo, São Paulo, Brasil.

⁴ Instituto de Assistência Médica ao Servidor Público Estadual de São Paulo, Programa de Pós-Graduação em Ciências da Saúde. São Paulo, SP, Brasil.

⁵ Universidade Federal do Rio Grande do Norte, Departamento de Medicina. Natal, RN, Brasil.

Funding: MCTI/CNPq. N° do processo: 14/2014. Projeto do edital Universal.

The authors declare that there is no conflict in the conception of this work.

Correspondence
Adriana Guedes Carlos
adrianaguedes@hotmail.com

Received: June 26, 2023
Approved: November 21, 2023

INTRODUCTION

Disability related to type 2 diabetes mellitus (T2DM) critically affects older adults and is recognized as an emerging health problem related to increased life expectancies worldwide. Also, T2DM can cause several complications and impair postural control (PC) due to decreased proprioception and strength and increased stiffness in ankle joints¹.

Individuals with T2DM present a higher fall risk than healthy individuals in the same age group. The prevalence of falls among older adults with and without diabetes was 25.0% 18.2%, respectively². Older adults with T2DM may present balance impairments and falls due to impaired sensory systems (e.g., impaired proprioception in lower limbs due to neuropathy). The main cause of falls is the loss of balance due to impaired PC (e.g., impaired visual, somatosensory, auditory, and vestibular systems or mixed, motor and autonomic disorders)².

Comorbidities related to complications of individuals with T2DM are common, such as hypertension, cardiovascular disease, vascular disease and the risk foot ulceration and/or lower extremity amputation³.

The use of a cutoff point to classify older adults at risk of falls can be a useful tool in early identification and targeted interventions to prevent falls and improve balance. Additionally, by providing detailed information on the domains of the Mini-BESTest that were compromised, the study allows for a comprehensive understanding of balance impairment in this population.

These contributions help to contribute to the literature, in addition to providing valuable insights for healthcare professionals who work with older adults with T2DM, helping to identify and effectively treat balance problems and fall risk in this specific population.

This study aimed identify clinical-functional factors associated to the risk of falls, assessed by Mini-BESTest in older adults with type 2 diabetes mellitus (T2DM).

METHOD

We conducted a cross-sectional study (random sample) with older adults aged ≥ 60 years of both sexes and diagnosed with T2DM. The study included older adults diagnosed with T2DM by a physician, who provided their laboratory tests for evaluation.

We excluded older adults submitted to balance rehabilitation in the last six months; unable to understand or follow simple verbal commands or repeat movements; with severe visual or auditory impairment hampering to perform activities of daily living (even with corrective lenses or hearing aids); with lower limb amputations (regardless of the level); unable to independently walk; or walk using assistive devices.

The outpatient assessment was performed at the university hospital in Rio Grande do Norte, over the course of one year, starting in August 2015 and ending in August 2016, the evaluated patients were referred from the gerontology and endocrinology outpatient clinics of the Onofre Lopes University Hospital.

The BESTest is a clinical tool that assesses balance, fall risk, and domains that could be focused during rehabilitation⁵. This test comprises six systems that may impair balance: biomechanical constraints, stability limits, postural responses, anticipatory postural adjustments, sensory orientation, and stability in gait⁵.

The Mini-BESTest comprises 14 tests and 16 items (bilateral assessment), completed between 15-20 minutes. Scores range from 0 to 28 points^{7,8}. The suggested cutoff point of the Mini-BESTest to identify older adults with history of falls was 20.5 of 28 points, with 60% sensitivity and 71% specificity to identify changed postural responses^{6,7}.

Questions are divided into four domains corresponding to the systems that maintain the PC:

1. Transitions and anticipatory postural adjustments;
2. Postural responses to disturbance;

3. Sensory orientation;
4. Stability in gait.

Each item is scored on an ordinal scale of 3 points (0 to 2); 0 is the worst performance and 2 is the best⁴. The dual-task TUG assesses the ability to perform two different tasks simultaneously. Older adults were asked to perform the TUG and simultaneously evoke as many animal names as they could remember. Older adults were seated with feet on the floor and back supported on the chair. After the evaluator commanded, older adults should stand up, walk three meters, turn around their axis and return to the starting position⁸. A chronometer measured the time to cover the distance, and older adults were encouraged to walk at their usual speed⁵. They were classified into two groups based on the test time: high fall risk (≥ 13.5 seconds)^{9,10}.

We used a questionnaire to identify age, sex, marital status, education level, and, reported diseases, number of medications, perceived vision and hearing.

History of falls in the last 12 months and fear of falling were evaluated through the following questions: "did you fall in the last 12 months?"; "are you afraid of falling?" All older adults were asked about chronic dizziness (i.e., \geq two months of dizziness). Dizziness was defined as the sensation of disturbed or impaired spatial orientation with no false or distorted sense of motion, not including vertiginous sensations¹¹. Dizziness was assessed through the question "have you felt dizzy in the last two months?"

Older adults were also asked about the time of T2DM diagnosis, values of glycated hemoglobin (%) and fasting glucose (mg/dL) in the last six months and ongoing medication for diabetes (oral medication, insulin or both).

Regarding functional variables, height (m) was measured using a tape attached to the wall, and body mass (kg) was measured using a platform scale. Body mass index (BMI; kg/m^2), also known as the Quételet index^{14,15}, was based on the Nutrition Surveillance System (SISVAN) of the Brazilian Ministry of Health. Cutoff points were determined and classified as underweight (≤ 22), eutrophic (23 to 26), and overweight (≥ 27)^{12,13}. Regular physical

activity was defined as \geq three times a week for >30 minutes during the last two weeks¹⁴.

Muscle strength was assessed using a Saehan dynamometer and conducted according to the American Society of Hand Therapists¹⁵. During the handgrip strength test, the evaluator instructed the older adult to maintain the maximum strength. Three measures were collected, with an interval of one minute between each attempt. Results were obtained from the mean of the three measures (kg), and values were adjusted by sex and BMI¹⁶.

Psycho-cognitive data were assessed using the Mini-Mental State Exam (MMSE) and Geriatric Depression Scale Abbreviated (GDS-15). The MMSE is widely used to assess cases of suspected cognitive deficits^{17,18} and its reliability and validity were considered satisfactory¹⁹. Cutoff points were adopted according to years of education: illiterate (20 points); one to four years (25 points); five to eight years (26 points); nine to eleven years (28 points); and for more than eleven years (29 points)²⁰.

The GDS-15 is a quick and easy-to-use tool that identifies depressive symptoms in older adults. This version comprises 15 questions with scores indicating no depression (0 to 4 points), mild to moderate depression (5 to 10 points) and severe or intense depression (11 to 15)^{21,22}.

We used the Kolmogorov-Smirnoff test verified data normality. Quantitative variables were described as descriptive measures. The analyzed independent variables were sociodemographic, clinical, functional and psycho-cognitive. Statistical significance was set at 5% ($p < 0.05$) for all analyses.

In this study, the dependent variable was falls risk of the Mini BESTest, which was analyzed using the SPSS software version 17.0 for Windows. For inferential analysis, we verified the associations between the risk of fall determined by the cutoff points of the Mini BESTest according to age groups (25 points - 60 to 69 years; 23 points - 70 to 79 years; 22 points 80 to 89 years)⁸. Falls risk (Mini-BESTest) (dependent variable) and the independent variables (sociodemographic and clinical functional) using a multivariate logistic regression analysis using the stepwise forward method.

The variables that showed statistical significance ($p < 0.20$) in the bivariate analysis were inserted into the adjusted model (sex, age group, educational level, number of illnesses, physical activity and falls in the last year), with those with $p < 0.05$ being retained. Multicollinearity test using VIF was conducted. The final model met the assumption of absence of multicollinearity and the Hosmer and Lemeshow test ($p = 0.150$) indicated that there are no significant differences between the results predicted by the model and the observed reality.

We hypothesized that the factors associated to the greater risk of falls in older adults with T2DM are female sex, lower educational level, greater number of diseases, use of insulin, negative perception of vision, complaints of dizziness and longer illness duration.

The project was approved by the Research Ethics Committee of the Federal University of Rio Grande do Norte (UFRN), under number CAAE: 45183715.0.0000.5537.

DATA AVAILABILITY

The entire dataset supporting the results of this study is available upon request from the corresponding principal investigator, Adriana Guedes Carlos.

RESULTS

Six older adults were excluded due to lower limb amputations, five due to the use of walking aid

devices and one due to severe visual impairment. Most older adults were female (64.8%). Also, most older adults were married (66.9%) and educational level was classified as incomplete elementary school / complete elementary school (34.5%) and elementary school / illiterate (65.5%). The age group was 60-69 years (62.0%), 70-79 years (29.0%) and 80-89 years (9.0%).

In this study, older adults with five or more diseases (39.3%), diseases of the cardiovascular system (78.6%), five or more medications (62.8%), vision poor or very poor (44.8%), hearing poor or very poor (27.6%), six or more years of T2DM diagnosis (71.0), T2DM medication oral (64.8%), handgrip strength low strength (the lowest quintile) (43.4%), none falls in the last year (62.1%), falls risk (Mini-BESTest) (52.4%), regular physical activity (26.2%), body mass index malnourished or normal weight (63.4%), glycated hemoglobin ($n = 108$) up to 8% (normal) (39.3%), fasting blood glucose ($n = 133$) up to 130mg/dl (normal) (50.3%), pain in lower limbs (57.1%), dizziness complaint (44.1%), global cognition positive screening (42.1%), depressive symptoms (GDS-15) 6 or more (47.2%), falls risk (dual-task TUGT) ($n = 136$) and 13.5 seconds or more (high) (77.2%). The sample characterization is shown in Table 1.

The mean total score of the Mini-BESTest was $80.8\% \pm 4.6\%$ and 95% confidence interval (CI) 78.4-83.3. The average and their respective 95% confidence interval (CI) of the Mini-BESTest domains are presented in Table 2.

Table 1. Characteristics of older adults with Type 2 Diabetes Mellitus followed up at a university hospital in northeastern Brazil in 2016 (N = 145).

Categories	Occurrence	Percent (%)
Number of diseases		
1 – 4	88	60.7
5 or more	57	39.3
Category of diseases		
Infectious and parasitic	0	0.0
Neoplastic (tumors)	10	6.9
Blood, organs, hemopoietic and/or immune disorders	42	29.0

to be continued

Continuation of Table 1

Categories	Occurrence	Percent (%)
Mental and/or behavioral disorders	7	4.8
Eye and annex	29	18.6
Nervous system	9	6.2
Cardiovascular system	114	78.6
Respiratory system	13	9.0
Digestive system	18	12.4
Skin and/or subcutaneous tissue	3	2.1
Musculoskeletal system and/or tissue	57	39.3
Genitourinary	27	18.6
Number of medications		
0 – 4	2	2.4
5 or more	91	62.8
Vision		
Poor / Very Poor	65	44.8
Hearing		
Poor / Very Poor	40	27.6
Time of T2DM diagnosis		
0 – 5	42	29.0
6 or more	103	71.0
T2DM Medication		
Does not use	6	4.1
Oral	94	64.8
Oral insulin +	32	22.1
Insulin	13	9.0
Handgrip strength		
Low strength (the lowest quintile)	63	43.4
Falls in the last year		
None	90	62.1
One fall	27	18.6
Two or more falls	28	19.3
Falls risk (Mini-BESTest)		
No	69	47.6
Yes	76	52.4
Regular physical activity		
Yes	38	26.2
Body Mass Index		
Malnourished or normal weight	92	63.4
Overweight	53	36.6
Glycated hemoglobin (n=108)		
Up to 8% (normal)	57	39.3
Above 8,1% (altered)	51	35.2

to be continued

Continuation of Table 1

Categories	Occurrence	Percent (%)
Fasting blood glucose (n=133)		
Up to 130mg/dl (normal)	73	50.3
131mg/dl or more (altered)	60	41.4
Pain in lower limbs		
Yes	75	57.1
Dizziness complaint		
Yes	64	44.1
Global cognition		
Positive screening	61	42.1
Depressive symptoms (GDS-15)		
6 or more	68	47.2
Falls risk (dual-task TUGT) (n=136)		
13.5 seconds or more (high)	112	77.2
High (low)	24	16.6

T2DM: Type 2 Diabetes Mellitus; GDS: Geriatric Depression Scale; TUGT: Timed Up and Go Test; Mini-BESTest: Mini-Balance Evaluation Systems Test.

Table 2. Percentage of impairment in Mini-BESTest domains among older adults with Type 2 Diabetes Mellitus at a university hospital in northeastern Brazil in 2016 (N=145).

Mini-BESTest Domains	Mean (\pm SD) in %	95% CI
Anticipatory postural adjustment (%) tasks		
Total	78.2 (17.1)	75.3 to 81.1
Seated to standing	97.1 (14.4)	94.7 to 99.5
Stand on tiptoe	87.1 (25.7)	82.9 to 91.4
Standing on one leg	53.2 (27.6)	48.6 to 57.8
Postural responses (%) tasks		
Total	64.1 (31.9)	58.7 to 69.4
Forward	71.5 (37.9)	65.2 to 77.9
Backward	65.0 (36.8)	58.9 to 71.1
Side	55.0 (39.0)	48.5 to 61.5
Sensory orientation (%) tasks		
Total	93.6 (13.5)	91.3 to 95.8
Solid surface	98.2 (9.3)	96.6 to 99.7
Foam Surface	86.7 (28.5)	82.0 to 91.5
Tilt	95.7 (14.0)	93.4 to 98.1
Stability in gait (%) tasks		
Total	84.7 (17.70)	81.7 to 87.6
Speed	91.8 (19.5)	88.5 to 95.0
Head turn	80.3 (26.6)	75.9 to 84.8
Axis turn	91.8 (20.4)	88.4 to 95.2
Overcome obstacle	80.3 (29.8)	75.4 to 85.3
Timed Up and Go Test	77.5 (29.6)	72.5 to 82.4

*Data presented as average and their respective 95% confidence interval (CI).

Table 3 present the inferential analysis between the variable “falls risk” of the Mini-BESTest and sociodemographic, clinical and functional variables. In the sociodemographic variables there was a significant association between the “falls risk” of Mini BESTest and sex, indicating that males, compared to females, had a worse result on the Mini-BESTest the educational level, married age group no are associated with risk of falls.

In the functional-clinical variables there was a significant association between the “falls risk” of Mini BESTest and hearing and vision, indicating that both a negative perception of hearing and vision as "poor" or "very poor" are associated with a greater balance impairment. In the psycho-cognitive variables there was a significant association between the “falls risk” of Mini BESTest and GDS-15, indicating that a de "six or more" depressive symptoms are associated with a greater balance impairment.

In the functional-clinical variables there was a significant association between the “falls risk” of

Mini BESTest and disease of system respiratory, regular physical activity, dizziness complaint and falls risk (dual-task TUGT), as shown in Table 3.

The was not associated with other clinical-functional and psycho-cognitive variables related others diseases classifications, number of medications, T2DM medication, time of T2DM diagnosis, handgrip strength, glycated hemoglobin, fasting glucose, pain in lower limbs BMI and MMSE.

The “odds ratio” values estimated by the multivariate model are shown in Table 4. Older adults with poor/very poor visual perception have three times the chance of falling when compared to those with excellent/very good/good vision; the fact that older adults have respiratory diseases increases the likelihood of falls by eight times; having a feeling of dizziness increases the likelihood of falls twice; and when the TUGT (dual task) time is equal to or greater than 13.5 seconds, the likelihood of falls increases three times.

Table 3. Inferential analysis between the variable “falls risk” of the Mini-BESTest and sociodemographic, clinical-functional and psycho-cognitive variables of older adults with Type 2 Diabetes Mellitus at a university hospital in northeastern Brazil in 2016 (N=145).

Variables and Categories	No	Yes	p-value
Sex			
Male	34 (23.4%)	17 (11.7%)	0.001 *
Female	35 (24.1%)	59 (40.7%)	
Vision			
Excellent / very good / good	50 (34.5%)	30 (20.7%)	<0.001 *
Poor / Very Poor	19 (13.1%)	46 (31.7%)	
Hearing			
Excellent / very good / good	57 (39.3%)	48 (33.1%)	0.010 *
Poor / Very Poor	12 (8.3%)	28 (19.3%)	
Regular physical activity			
Yes	25 (17.2%)	13 (9.0%)	0.013*
No	44 (30.3%)	63 (43.4%)	
Number of diseases			
1 – 4	50 (34.5%)	38 (26.2%)	0.007 *
5 or more	19 (13.1%)	38 (26.2%)	
Respiratory system			
Yes	2 (1.4%)	11 (7.6%)	0.019 *
No	67 (46.2%)	65 (44.8%)	

to be continued

Continuation of Table 3

Variables and Categories	No	Yes	p-value
Falls in the last year			
None	50 (34.5%)	40 (27.6%)	0.046 *
One fall	10 (6.9%)	17 (11.7%)	
Two or more falls	9 (6.2%)	19 (13.1%)	
Dizziness complaint			
Yes	20 (13.8%)	44 (30.3%)	0.001 *
No	49 (33.8%)	32 (22.1%)	
Depressive symptoms (GDS-15)			
6 or more	23 (16.0%)	45 (31.2%)	0.002 *
Up to 5	46 (31.9%)	30 (20.8%)	
Falls risk (dual-task TUGT)			
13.5 seconds or +	5 (3.7%)	19 (14.0%)	0.006 *
< 13.5 seconds	59 (43.4%)	53 (39.0%)	

* Qui-quadrado Test; T2DM: Type 2 Diabetes Mellitus; GDS: Geriatric Depression Scale; TUGT: Timed Up and Go Test; Mini-BESTest: Mini-Balance Evaluation Systems Test.

Table 4. Binary logistic regression model for assessment of factors associated with risk of falls in older adults with Type 2 Diabetes Mellitus (N=145).

Predictor category	OR (95% CI)	p-value
Vision		
Poor/very poor	3.40 (1.50 - 7.72)	0.003
Respiratory diseases		
Yes	8.00 (1.32 - 48.46)	0.024
Dizziness complaint		
Yes	2.53 (1.10 - 5.80)	0.028
Dual-task TUGT		
13.5 seconds or more	3.31 (1.03 - 10.64)	0.045

Model adjusted by sex, age group, schooling, number of diseases, physical activity practice and falls in the last year. TUGT: Timed Up and Go Test; OR: odds ratio; CI 95%: 95% confidence interval. Hosmer and Lemeshow test ($p=0.150$).

DISCUSSION

The present study verified the associated between the risk of falls and sociodemographic, clinical, functional and psycho-cognitive in older adults with T2DM.

The results obtained indicated a greater likelihood of falls in older adults females, with a greater age range, with a greater number of diseases, with the presence of respiratory diseases and depressive symptoms, reports of falls in the last year and difficulty in performing exercise that requires dual task, when compared to the

group with low likelihood of falls and consequently lower Mini-BESTest values.

The fact that females presented associated with risk of falls compared to males may be related to hormonal variations, body composition and self-care behaviors, as women tend to seek more medical assistance²³.

T2DM is often associated with an increased likelihood of falls, as assessed by Mini-BESTest. Mini-BESTest averages may vary according to average age²⁴. In this study, the average age and performance were 60 to 69 years (62.01%), 70 to 79

years (29.0%) and 80 to 89 years (9.0%). In a previous study, the average age and performance was 60 to 69 years (14%), 70 to 79 years (33%) and 80 to 89 years (34%)⁸, indicating that older adults with a lower age range had a higher Mini-BESTest resulting in a lower likelihood of falls. Older adults between the seventh and eighth decades of life showed a decrease in performance in the Mini-BESTest²³.

PC to function efficiently, ensuring a low risk of falls, depends on the performance of three systems: visual, somatosensory, auditory and vestibular¹.

The majority of older adults in the present study reported vision and hearing as poor or very poor. Visual deficit is common in the population of individuals with T2DM, increasing the likelihood of falls by up to 4 times. Worsening vision causes a series of problems such as self-administration of medications, in addition to difficulty adhering to treatment, which can lead to blindness or diabetic retinopathy²⁵. These problems result in worsening balance, indicating a deficiency in the visual system, the system responsible for PC¹.

It was observed that the increase in age in the older adults increases the occurrence of hearing loss, when added to T2DM, these individuals tend to the increased the likelihood of falls. Studies report that hearing loss is related to cognitive loss²⁵. Common problems found in individuals with decompensated diabetes²⁶.

A study shows that glucose metabolism influences the physiology of the inner ear, causing vestibular and auditory changes. Dizziness is one of the main symptoms reported by individuals who have vestibular dysfunction. There is an identified relationship between those who experience dizziness and the time taken to diagnose diabetes. In long-lasting cases of the disease, there is generally an increase in blood glucose and glycated hemoglobin levels²⁷. Therefore, older adults who report dizziness and have T2DM are twice as likely to fall.

Cognitive impairment can hinder TUG performance in a simultaneous cognitive task, altering gait (e.g. reduced speed and long test duration)²⁸. Furthermore, the history of falls was another critical piece of data. These falls were related

to reduced balance and difficulty walking, which are even more compromised when the older adults are asked to perform the dual-task TUG²⁴.

A previous study suggested an association between reduced cognitive function and depressive symptoms in older people with diabetes⁷. According to the GDS-15, the reduction in depressive symptoms in the older adults was related to increased performance in the Mini-BESTest. Furthermore, depressive symptoms can make it difficult to understand and perform on tests²⁴.

Generally, those with T2DM have other associated diseases such as respiratory diseases, systemic arterial hypertension, obesity and dyslipidemia. Respiratory diseases, as well as T2DM, are classified as the main chronic non-communicable diseases²⁹. According to our study, older adults with T2DM have an 8 times the chance of falling. Previous studies report a positive association between a higher risk of falls in individuals with respiratory diseases, such as chronic obstructive pulmonary disease. This is explained by the breathing pattern that leads to changes in PC³⁰.

Previous research suggests that hospitalization rates rise among older females as the age group increases, as well as for individuals with lower levels of education. Regarding clinical factors, it was observed that there is an increase in hospitalizations in the presence of multiple comorbidities. It was also found that one of the factors that precede hospitalization is the frequent occurrence of episodes of falls³¹.

Preventing the risk of falls is a public health challenge. The regular practice of physical activity, the correction of visual impairments, the management of respiratory disorders, the treatment of foot conditions, the modification of environmental risk factors at home and the education of the individual are crucial points that must be worked on. Physical exercise performed for at least 30 minutes three times a week is considered a factor in the prevention and treatment of various comorbidities that tend to arise with the aging process.

We hypothesized that the factors associated to the increased the likelihood of falls in older adults with DM2 were: being female; having less education, a greater number of illnesses, taking insulin, having a negative perception of vision, complaining of

dizziness, having impaired mobility and having a longer illness. The variables that were not significant in the hypothesis were: taking insulin and having a longer illness.

Limitations of the research: many older adults were unaware of the disease. They did not know or remember when they were diagnosed with DM2 or what medications they were taking for diabetes, nor what basic care they should take.

CONCLUSION

The older adults in this study had impaired balance, especially in the domain of postural responses. Several factors might influence poor postural responses, such as excess weight, low physical activity and education, various comorbidities, polypharmacy, diagnosis of DM2 more than ten years ago, negative perception of general health and vision and depressive symptoms. Therefore, the results of this study are of clinical and scientific relevance. This research contributes to research in the field of geriatrics and gerontology, leading to the discovery of new future studies based on the research findings. In addition to assisting health professionals in the appropriate management of elderly patients with DM2, assisting in the accurate diagnosis of the general and functional status of the latter and providing guidance on the appropriate treatment plan.

REFERENCES

1. Yang Y, Hu X, Zhang Q, Zou R. Diabetes mellitus and risk of falls in older adults: a systematic review and meta-analysis. *Age and Ageing*. 2016;45:761-767. <http://doi: 10.1093/ageing/afw140>
2. Qin J, Zhao K, Chen Y, Guo S, You Y, Xie J, et al. The effects of exercise interventions on balance capacity in patients with type 2 diabetes mellitus: A systematic review and meta-analysis. *Inquiry*. 2021;58:1-16. <http://doi/10.1177/00469580211018284>
3. LeRoith D, Biessels GJ, Braithwaite SS, Casanueva FF, Draznin B, Halter JB, et al. Treatment of Diabetes in Older Adults: An Endocrine Society* Clinical Practice Guideline. *J Clin Endocrinol Metab*. 2019;104(5):1520-1574. <http://doi: 10.1210/jc.2019-00198>.
4. Horak FB, Wrisley DM, Frank J. The balance evaluation systems test (BESTest) to differentiate balance deficits. *Phys Ther*. 2009;89:484-498. <http://doi: 10.2522/ptj.2008001>
5. O'Hoski S, Sibley KM, Brooks D, Beauchamp MK. Construct validity of the BESTest, Mini-BESTest and BriefBESTest in adults aged 50 years and older. *Gait Posture*. 2015;42(3):301-5. <http://doi: 10.1016/j.gaitpost.2015.06.006>
6. Yingyongyudha A, Saengsirisuwan V, Panichaporn W, Boonsinsukh R. The Mini-Balance Evaluation Systems Test (Mini-BESTest) demonstrates higher accuracy in identifying older adult participants with history of falls than do the BESTest, Berg Balance Scale, or Timed Up and Go test. *J Geriatr Phys Ther*. 2015;38:1-7. <http://doi:10.1519/JPT.0000000000000050>

AUTHORSHIP

- Adriana Guedes Carlos - conceptualization; data curation; formal analysis investigation; methodology; project administration; resources; visualization; writing - original draft; writing - review & editing.
- Vanessa da Nóbrega Dias - conceptualization; data curation; formal analysis investigation; methodology; project administration; resources; supervision; visualization; writing - original draft; writing - review & editing.
- Monica Rodrigues Perracini - conceptualization; investigation; methodology resources; supervision; visualization.
- Flávia Doná - methodology; resources; supervision; visualization.
- André Gustavo Pires Sousa - conceptualization; investigation; methodology; supervision; visualization.
- Juliana Maria Gazzola - conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software; supervision; visualization.





Edited by: Marquiony Marques dos Santos

7. Marques A, Silva A, Oliveira A, Cruz J, Machado A, Jácome C. Validity and relative ability of 4 balance tests to identify fall status of older adults with type 2 diabetes. *J Geriatr Phys Ther.* 2017;40(4):227-232. <http://doi:10.1519/JPT.000000000000109>. PMID: 27824659
8. Magnani PE, Genovez MB, Porto JM, Zanellato NFG, Alvarenga IC, Freire RC Jr, de Abreu DCC. Use of the BESTest and the Mini-BESTest for Fall Risk Prediction in Community-Dwelling Older Adults Between 60 and 102 Years of Age. *J Geriatr Phys Ther.* 2020;43(4):179-184. <http://doi:10.1519/JPT.000000000000236>.
9. Franchignoni F, Horak F, Godi M, Nardone A, Giordano A. Using psychometric techniques to improve the Balance Evaluation Systems Test: the mini-BESTest. *J Rehabil Med.* 2010;42:323-331. <http://doi:10.2340/16501977-0537>
10. Barry E, Galvin R, Keogh C, Horgan F, Fahey T. Is the Timed Up and Go Test a useful predictor of risk of falls in community-dwelling older adults: A systematic review and meta-analysis. *BMC Geriatrics.* 2014;14:2-14. <http://doi:10.1186/1471-2318-14-14>
11. Aratini MC, Ricci NA, Caovilla HH, Ganança FF. Benefits of vestibular rehabilitation on patient-reported outcomes in older adults with vestibular disorders: A randomized clinical trial. *Braz J Phys Ther.* 2020;24(6):550-559. <http://doi.org/10.1016/j.bjpt.2019.12.003>
12. Traoré D, Traoré AH, Sow DS, Konaté M, Koné A, N'Diaye HD, et al. Lipid profile among the diabetic and non-diabetic obese patients. *Open Journal of Internal Medicine.* 2018;8:89-97. <http://doi:10.4236/ojim.2018.81010>
13. Malak MZ, Suleiman KH, Al-amer RM, Al-Zayyat AK, Salameh AO. Screening of Bone Mineral Density (BMD) among elderly population in Jordan. *Mal J Med Health Sci.* 2020;16(1):77-84. Accessed March 19, 2022. https://medic.upm.edu.my/upload/dokumen/2020011612013312_MJMHS_0166.pdf
14. Gazzola JM, Caovilla HH, Doná F, Ganança MM, Ganança FF. A quantitative analysis of postural control in elderly patients with vestibular disorders using visual stimulation by virtual reality. *Braz J Otorhinolaryngol.* 2020;86(5):593-601. <http://doi.org/10.1016/j.bjorl.2019.03.00>
15. Dias VN, Lemos AF, Filho BFL N, Lira MGA, Cavalcanti FAC, Gazzola JM. Palmar strength and sociodemographic, clinical-functional, and psychocognitive factors in elderly with measured with diabetes mellitus. *Fisioter Mov.* 2019;32:e003223. <http://doi.org/10.1590/1980-5918.032.AO23>
16. Fried LP, Ferrucci L, Darer J, Williamson JD, Anderson G. Untangling the concepts of disability, frailty, and comorbidity: implications for improved targeting and care. *J Gerontol A Biol Sci Med Sci.* 2004;59(3):255-263. <http://doi:10.1093/gerona/59.3.m255>
17. Creavin ST, Wisniewski S, Noel-Storr AH, Trevelyan CM, Hampton T, Rayment D, et al. Mini-mental State Examination (MMSE) for the detection of dementia in clinically unevaluated people aged 65 over in community and primary care population. *Cochrane Library.* 2016;13(1):CD011145. <http://doi.org/10.1002/14651858.CD011145.pub2>
18. Mitchell AJ, Shukla D, Ajumal HA, Stubbs B, Tahir TA. The Mini-Mental State Examination as a diagnostic and screening test for delirium: systematic review and meta-analysis. *Gen Hosp Psychiatry.* 2014;36(6):627-33. <http://doi:10.1016/j.genhosppsych.2014.09.003>.
19. Tombaugh T, McIntyre Cand NJ. The Mini-Mental State Examination: a comprehensive review. *J Am Geriatric Society.* 1992;40(9):922-935. <http://doi:10.1111/j.1532-5415.1992.tb01992.x>
20. Scarabelot LF, Monteiro MM, Rubert MCS, Zetola VHF. Is the Mini-Mental State Examination the best cognitive screening test for less educated people? *Arq Neuropsiquiatr.* 2019;77(5). <http://doi:10.1590/0004-282X20190043>
21. Yesavage JA, Brink TL, Rose TL, et al. Development and validation of geriatric depression screening scale: a preliminary report. *J Psychiatry Res.* 1983;17(1):37-49. [http://doi:10.1016/0022-3956\(82\)90033-4](http://doi:10.1016/0022-3956(82)90033-4)
22. Yesavage JA, Sheikh JI. Geriatric Depression Scale (GDS): recent evidence and development of a shorter version. *Clinical Gerontologist.* 1986;5(1-2):165-173. http://doi:10.1300/J018v05n01_09
23. Lopez-Benavente Y, Arnau-Sánchez J, Ros-Sánchez T, Lidón-Cerezuela MB, Serrano Noguera A, Medina-Abellán MD. Difficulties and motivations for physical exercise in women older than 65 years. A qualitative study. *Rev Latino-Am Enfermagem.* 2018;26. <https://doi.org/10.1590/1518-8345.2392.2989>
24. Kafri M, Hutzler Y, Korsensky O, Laufer Y. Functional performance and balance in the oldest-old. *J Geriatr Phys Ther.* 2019;42(3):183-188. <http://doi:10.1519/JPT.000000000000133>
25. Torres LRL, Baeck HE, Diógenes BS, Gurgel YM. Investigação dos fatores de risco pré-estabelecidos para perdas auditivas em idosos. *REAS [Internet].* 2023;23(3):e12452. <https://doi.org/10.25248/reas.e12452.2023>

26. Filho BFL, Gama AGD, Dias VN, Silva EMT, Cavalcanti FAC, Gazzola JM. Síndrome da Fragilidade em idosos com diabetes mellitus tipo 2 e fatores associados. *Rev Bras Geriatr Gerontol.* 2020;23(01). <http://doi.org/10.1590/1981-22562020023.200196>
27. Fukunaga JH, Quitschal RM, Dib AS, Ganança MM, Caovilla HH. Postural balance in type 2 diabetics with vertigo, dizziness and/or unsteadiness. *CoDAS.* 2020;32(6):e20190070. <http://doi.org/10.1590/2317-1782/20202019070>
28. Morlino P, Balbi B, Guglielmetti S, Giardini M, Grasso M, Giordano C, et al. Gait abnormalities of COPD are not directly related to respiratory function. *Gait Posture.* 2017;58:352-357. <http://doi: 10.1016/j.gaitpost.2017.08.020>
29. Pagotto V, Dias DM, Pezarini LO, Sousa JM, Oliveira MDS, Lima JOR. Polifarmácia e potenciais interações medicamentosas em adultos e idosos com diabetes mellitus: estudo transversal. *Revista Recien.* 2023;14(41). doi.org/10.24276/rrecien2023.13.41.540-550
30. Paliwal Y, Slattum PW, Ratliff SM. Chronic Health Conditions as a Risk Factor for Falls among the Community-Dwelling US Older Adults: A Zero-Inflated Regression Modeling Approach. *BioMed Research International.* 2017. <https://doi.org/10.1155/2017/5146378>
31. Dias MPB, Barros RS, Medeiros GVL, Sampaio RX, Garcia PA. Baixa escolaridade, polifarmácia e declínio funcional são fatores associados à hospitalização de idosos: estudo transversal. *Saúde Coletiva (Barueri).* 2023;13(87). <https://orcid.org/0000-0002-8452-5124>



Social isolation amid the COVID-19 pandemic and mental health: perspectives of institutionalized older adults

Iasmin Narciso¹ 
Flávia de Oliveira² 
Silmara Nunes Andrade² 
Kellen Rosa Coelho² 

Abstract

Objective: To understand the impact of social isolation during the COVID-19 pandemic on the mental health of institutionalized older adults, from the perspective of these residents. **Method:** An exploratory-descriptive study with a qualitative approach was conducted in two LTCFs in the city of Divinópolis, Minas Gerais State, Brazil. A questionnaire was applied for identification, whereas for qualitative data analysis, a semi-structured script with guiding questions about self-perceptions of social isolation during the pandemic was employed. Content analysis was used, drawing on Dorothea Orem's theory. **Results:** Thirteen older adults participated and the following thematic categories were identified: Feelings of the residents about social isolation amid the pandemic; Actions by residents to preserve mental and physical health during pandemic social isolation; Social isolation and physical inactivity as part of the lives of residents; COVID-19 viewed as trivial. **Conclusion:** Social isolation caused by the pandemic had a negative impact on the mental health of the institutionalized older adults and revealed the fact that social isolation was already part of their daily lives.

Keywords: Elderly. Long-stay Institution for the Elderly. COVID-19. Mental Health. Nursing.

¹ Universidade Federal de São João del-Rei, Campus Centro-Oeste Dona Lindu. Divinópolis, MG, Brasil

² Universidade Federal de São João del-Rei - Campus Centro-Oeste Dona Lindu, Grupo de Atuação Docente Saúde do Adulto e Idoso. Divinópolis, MG, Brasil

No funding was received in relation to the present study.

The authors declare that there is no conflict in the conception of this work.

Correspondence
Iasmin Narciso
a162iasmin@hotmail.com

Received: July 28, 2023
Approved: November 23, 2023

INTRODUCTION

The number of older adults is rising every year and represents a significant contingent of the population¹. In this context, together with senescence, older individuals are more susceptible to complications due to chronic non-communicable diseases (NCDs)², with a high prevalence of cardiovascular diseases. The high morbidity in older adults means chronic NCDs can be associated with loss of functioning and limitations in their activities of daily living (ADLs), rendering them more dependent for carrying out essential tasks.

Initially, the burden of caring for dependent older individuals falls to family members². However, in cases where the level of dependence requires care which exceeds the ability of family caregivers, the relationship with the family is strained, or no family support is available, the older individual may need to be institutionalized³.

Thus, shifts in family structures and difficulties faced in caring for older adults are some of the factors contributing to the rise in institutionalization. In this scenario, institutionalization can be accompanied by exclusion as a result of estrangement from the family, forcing the older individual to adapt to a new environment with new rules that is removed from the outside world⁴. Removal of material property is an aspect that contributes to the process of distancing, since social isolation and loneliness can be exacerbated by digital exclusion which may not have been experienced prior to residing in long-term care facilities (LTCFs)^{4,5}.

Resolution no. 502 of the Brazilian Health Surveillance Agency (ANVISA)⁶ stipulates, among other conditions for operating LTCFs, the promotion of participation of family and community in the care of the institutionalized resident and the running of activities that promote autonomy and independence, reinforcing that close interpersonal contact represents a positive aspect in the quality of life of older adults⁷.

During the Coronavirus Disease 2019 (COVID-19) pandemic, preventive measures were introduced for LTCFs to control the spread of the disease, such as lockdowns, restrictions on group activities and quarantining of professionals suspected of being

contaminated by the infection⁸. These measures were especially important in LTCFs, given that the aging process involves greater susceptibility to infectious diseases and physical harm due to the less effective immune response, and lower capacity for tissue repair, an aggravating factor amid COVID-19⁹. As a result, LTCFs that ran group activities and provided social interactions between the residents and their relatives were forced to implement protocols with restrictive measures to prevent the spread of COVID-19¹⁰, resulting in reduced contact among professionals, family members and residents.

Evidence suggests these restrictive measures have negative impacts on LTCF residents, despite the use of strategies to try and combat social isolation, such as video calls. However, when residents resume close real interpersonal contacts, this has a positive impact on their well-being. Thus, personal interactions are essential activities for quality of life of aged individuals⁷.

With regard to mental health, emotional vulnerabilities are an issue, where the pandemic and social isolation have led to an increase in psychological disorders such as anxiety, depression and loneliness¹¹. Moreover, during the pandemic, a lack of self-care was another serious situation which emerged in older adults infected by COVID-19, favoring deleterious effects on physical and mental wellbeing of this population, besides a loss of independence for basic and instrumental ADLs, especially within the setting of LTCFs¹².

Coping strategies to mitigate the social isolation of this population during the pandemic included the use of technologies for communication and support in managing care, art therapy, music and drawing workshops, and games in a bid to reduce anxiety of residents. Nevertheless, barriers included the level of knowledge held on technology and access to it at the facilities for adopting important measures that favor the autonomy and independence of the residents^{13,14}.

In this scenario, the strict health approach to institutionalized older adults was an aspect that may have negatively impacted the mental health of this population and should be carefully considered by health professionals in the context of care provided within these facilities. Against this backdrop, it is

vital to investigate the impact of social isolation on the mental health of institutionalized older adults amid the COVID-19 pandemic. Therefore, the objective of the present study was to understand the impact of social isolation on the mental health of institutionalized older adults amid the COVID-19 pandemic from the perspective of these residents.

METHOD

An exploratory, descriptive study with a qualitative approach based on Orem's Theory of Self-Care for guiding questions of the investigation and the discussion of results was conducted. This theory involves the autonomy and independence of the individual for maintaining life and wellbeing. When there is a lack of self-care, intervention of the caregiver for the provision of care is needed¹⁵. The methodological guidelines observed the Consolidated Criteria for Reporting Qualitative Research (COREQ)¹⁶ checklist as the framework underpinning the execution of this study.

The study took place at two philanthropic LTCFs in a city located in the Mid-West region of Minas Gerais State. These facilities ensured lockdown and the safety of residents during the COVID-19 outbreak, particularly with respect to outside visitors and group activities within the facilities.

The study participants comprised older adults aged ≥ 60 years who were residents of the participating LTCFs and had sound orientation for time and place, as confirmed by the Mini-Mental State Exam¹⁷. Exclusion criteria were cognitive impairment due to pre-existing dementia and poor clinical health status precluding completion of the questionnaires. Recruitment of participants was performed by the researchers who visited the LTCFs and invited residents to take part in the study.

Data collection was carried out via face-to-face interviews between September and October 2022, with application of the questionnaire gathering sociodemographic data and information on health status to characterize the profile of this population. Quantitative data analyses entailed conducting a scripted interview based on the following guiding questions: (1) How did you feel during the social

isolation amid the COVID-19 pandemic?; (2) How did the social isolation amid the COVID-19 pandemic affect your mental health?; (3) What did you do during the social isolation period amid the COVID-19 pandemic?; (4) How was your self-care during the social isolation period amid the COVID-19 pandemic?

Individual interviews were conducted in rooms reserved within the premises of the facilities to ensure privacy, confidentiality and secrecy of information. Interviews lasted an average of 20 minutes and were sound-recorded with the consent of participants after signing of a Free and Informed Consent form (either in written form or by fingerprint for participants unable to sign their name).

For data analysis and treatment, the interviews were transcribed by the researchers. The sociodemographics data and health status information were tabulated in the Excel software, free version from Microsoft 365. The analysis and interpretation of the data was based on content analysis according to Bardin¹⁸, conducted in three stages: (1) Pre-analysis: transcription of raw data and "floating reading" of data, providing an initial impression of the material; (2) Material exploration: with the aim of reducing the text to expressions and subsequently clustering data into categories; (3) Treatment, inference and interpretation of results: analysis of data based on theoretical material, done by independent reading of transcriptions by the researchers in the present study. Triangulation for treating data was adopted by the researchers, who stored recordings, transcriptions and notes in the cloud which were produced and assessed by both researchers. After "floating reading", the researchers elected categories for later discussion. Two other researchers were involved in the data analysis, for a team of 4 researchers. In order to ensure anonymity and secrecy of the information, the phrases produced were labeled with the word "Resident", followed by Arabic numerals in ascending order to reflect the order of participation in the study.

This study was approved by the Ethics Committee for Human Research under the Certificate of Submission for Ethical Assessment (CAAE) 57935622.6.0000.5545 and permit no. 5.407.900. All

of the participants signed the consent form and ethics aspects were followed and observed in accordance with Resolution 510/16.

AVAILABILITY OF DATA

The full dataset underpinning the results of this study are available from Mendeley Data and can be accessed at DOI: 10.17632/5d23cvn94y.1.

RESULTS AND DISCUSSION

The sample consisted of 13 institutionalized older adults, comprising 9 (69%) females and 4 (30%) males. Regarding participant age, 3 (23%) were in the 60-75 years age group, 9 (69%) in the 75-89 group and 1 (7%) in the ≥ 90 years group. For education, 2 (15%) reported no formal education, 7 (53%) incomplete primary education, 3 (23%) complete primary education, and 1 (7%) complete secondary education. With regard to self-rated health status, 7 (53%) rated their health as good, 4 (30%) fair, 1 (7%) poor, and 1 (7%) as very poor. In response to the question on presence of chronic diseases, the majority ($n=8$, 61%) of participants reported at least one comorbidity, including hypertension, diabetes mellitus, thyroid disorder and Parkinson's disease. Regarding the qualitative approach probing the impacts of social isolation on mental health of institutionalized participants during the pandemic, the thematic analysis of the interviews revealed 4 categories, namely:

Feelings of residents about social isolation amid the pandemic

The participants reported their feelings, largely negative and apprehensive, including fear, sadness, concern, anguish, isolated and feeling cut off, and also feelings of agitation and being upset, as portrayed in the excerpts from the interviews below:

“I felt very sad, you know? And scared.. As each day went by the hospitals filled up with people.. right? It left us feeling down, you know? That was a lot.. a real downer. It seems to be getting a bit better now..that's it.. it was bad for everyone, right? That pandemic was really sad, it was so

sad, wasn't it? [...] We felt really worried about our family members out there. [...] It struck fear into us, you know? (Resident 1)

“I was really agitated and upset... I was really agitated and upset... It's bad, you know'. And there are people without a clue about it. How to deal with this. I knew nothing about it. So it hit me hard. You know? I already had my issues and suffered a lot. After, I was no longer worried about this.” (Resident 2)

“Oh the isolation.. yep.. that business of us not.. not having a cell phone to see the family, right? To communicate. We become isolated[.] I felt really isolated, you know? Cut off, isolated...” (Resident 3)

“I didn't feel anything, except fear. [...]” (Resident 4)

These reports reveal that the need to establish social distancing measures which, while helping control spread of the coronavirus, rendered people more vulnerable to negative thoughts and changes in patterns of behavior, particularly among aged individuals. This took place mainly owing to fears and uncertainties surrounding the pandemic⁷.

Akin to the present study, other reports also showed that lockdowns promoted feelings in the older population of loneliness and being cut off, besides feelings of anguish and deep sadness, favoring mental health problems^{7,19,20}. In this respect, the mounting concerns over the situation, themselves and the family, produced a heavy emotional burden in aged individuals, giving rise to depressive symptoms, insomnia, anxiety, stress, irritability, moodiness and low energy⁷.

In terms of self-care of older adults during the pandemic, it is important to emphasize that, with the increase in psychological symptoms, self-care became neglected by many older individuals, reducing the level of well-being and increasing perceived stress¹².

Furthermore, several factors such as the reduction or loss of social and family interaction, individual pre-disposition to mental health problems, and the risk of death experienced with the threat of the virus, played a role in promoting the onset of these negative

symptoms in older adults during the pandemic¹⁹. In addition, institutionalization alone also represents a factor that can lead to negative feelings and mental problems in residents⁴.

Another factor generating negative feelings during lockdown was the lack of access to technologies, as a result of having no cell phone. Given this means of communication can enable institutionalized residents to keep in touch with family and friends, its use constitutes an alternative allowing instant communication of older individuals with their loved ones.

Indeed, the social isolation of older adults could have been mitigated with the aid of technology as a coping strategy during the pandemic, since proper use of these devices can help maintain ties with family members and friends, and attenuate negative psychosocial effects of the pandemic. Consequently, negative sentiments can be reduced along with the feelings of being cut off and lonely⁷ and use of technology, although no substitute for person-to-person contact, can have a positive impact on wellbeing of this group. Digital inclusion of the older population, particularly institutionalized elders, warrants debate, given that the use of technologies as an occupational strategy can help ease the problems associated with social isolation²¹.

Contrasting with the negative feelings reported by participants, a feeling of protection against COVID-19 was also expressed, in as far as being safely confined in a controlled environment amid vulnerability to the infection. The discourse below illustrates this point:

“In my case I felt protected here, if I had been outside it may have been worse. In other words, protected from the pandemic. It’s because we stay here, isolated. Nobody left or entered. Nobody came in and nobody went out. Gradually, after vaccination you (visitors) began coming in, but no one would enter. After everyone here had been vaccinated, then yes.” (Resident 13)

Despite the negative factors, the decrease in close interpersonal contact contributed to feelings of protection. In this sense, because the LTCFs are

places of high risk for infection by the coronavirus, owing to the high number of older residents sharing the same space, most of whom present comorbidities and physical and cognitive disabilities, having strict lockdowns was construed as a positive factor for slowing transmission of the virus and paramount to protect the residents^{2,8,9,22}.

Hence, there is clearly a host of different factors which contributed to the feelings and apprehensions among the institutionalized residents during the period of social isolation. It is noteworthy that this group is naturally more frail and vulnerable not only to COVID-19, but also to developing a range of mental problems. This creates a need to adopt strategies that minimize the negative impacts of social isolation on the mental health of this population⁷.

Actions by residents to preserve mental and physical health during pandemic social isolation

When probed about the coping strategies used during pandemic isolation to preserve mental health, the participants reported measures of being involved spirituality, domestic tasks, efforts to promote health and general wellbeing, such as praying, meal routine and sleep habits, personal hygiene measures (bathing) and use of prescribed medications, besides social distancing and use of face masks. This category can be exemplified by the views below:

“It’s just to pray, eat and sleep. And summon God to help eradicate this problem, yes? Ah, I had to pray, right? (Resident 1)

“Wow.. Did I summon God. I summoned God and pleaded with him to help me.” (Resident 2)

“It was sweeping up, taking care of the corner, taking care of this corners of the canteen, the refectory, you know? Taking showers, right?...” (Resident 3)

“I showered the same way, ate, but wouldn’t go to the refectory the way I’m doing now, right?” (Resident 6)

“Yeh, when I went out, I had to wear a face mask, right?” (Resident 7)

“I had a shower, took my medications, lunch, dinner and breakfast, I slept and got up.. [...] They said “going out, you have to take the face mask, right?... We protected ourselves like that..” (Resident 10)

Based on Orem’s theory of self-care, which considers the individual ability to carry out actions for one’s own health and wellbeing, routine self-care activities are highly pertinent for leading life¹⁵. Given the pandemic period, when loss of autonomy and therapeutic requirements intensified, stimulating autonomy is relevant in the context of LTCFs so that older individuals can remain healthy and independent, particularly for basic activities of daily living (BADLs), such as bathing and feeding, as outlined earlier, as well as care activities promoting health, such as sleep, taking medications and using masks.

Also from this perspective of self-care, evidence shows that, possessing the capacity for resilience in coping with the challenges posed by the pandemic, older individuals are better equipped to deal with the difficulties imposed by the pandemic, restoring balance more easily and aiding the recovery of physical and mental health¹².

With regard to the activities undertaken by the older population during this period, engagement in spiritual practices through religion stood out. The activities cited by the participants, particularly praying, corroborate the fact that stimulating the use of religion as a form of resilience in challenging times is highly beneficial. These practices favor preservation of mental health in older adults, where benefits conferred by spirituality include regulating stress hormone and, in turn, well-being²³.

Another strategy mentioned was performing instrumental activities of daily living (IADLs), such as cleaning communal areas of the facility and tending to planters/gardens. The act of carrying out these activities, particularly by institutionalized residents, favors cognitive and motor stimulation and, consequently, helps these individuals maintain autonomy and independence. Thus, given the risk of sedentarism within LTCFs, it is fitting to encourage these activities in this population^{24,25}.

Social isolation and physical activity as part of the lives of residents

The interview revealed that social isolation and physical inactivity are part of the lives of institutionalized residents, irrespective of the pandemic and its social distancing rules. The fact that the residents showed they would normally remain isolated within the facilities, meant that many noted no differences between the lifestyle they led prior to and during the pandemic. Despite the biosafety measures adopted by the facilities, most notably rigorous lockdown and use of face masks, the routine within the facilities did not change greatly. This is evident in the narratives of the residents when asked about changes to their everyday routines during lockdown amid the pandemic.

“Ah, I didn’t do anything different at all. That was just it. Exactly the same.” (Resident 4)

“Well, same thing {...} So I felt no difference.” (Resident 6)

“No, didn’t affect anything really. We were ok here.” (Resident 13)

“But, I was like this, the same state as I am today. [...] Just as I said, it came and went as if nothing had happened. We weren’t affected here, so I have no comment to make about the event.. I don’t know if it’s because of being isolated..” (Resident 11)

This category posed a major challenge that the older population typically face during the aging process: social isolation. This stage of life is often marked by a significant reduction in social interaction of the older individual with their family members, friends and/or society as a whole. Factors such as the presence of chronic diseases, social inequities and more restricted social network favor this isolation. However, ageism, characterized by stereotypes and prejudices against older adults, may explain the segregation of older citizens from society and their consequent social disengagement²³.

In the context of institutionalized older adults, allied with social stereotypes of aging, it follows that

institutionalization is accompanied by being more removed from the family and material things and social isolation even by LTCF workers⁴.

Physical inactivity was another key point cited by the residents, with sedentary behavior within the facility, a ubiquitous feature of LTCF environments.

“I was doing nothing, because it’s true. As I did before, I didn’t have loads of things to do. [...] Because we don’t do a lot anyway, sitting down all day.” (Resident 4)

“I did nothing. I hardly leave the room..[...].” (Resident 8)

This level of inactivity warrants attention given that, besides the fact that engaging in functional activities confers cognitive benefits in this population, it is also positive for strengthening the immune system, preserving musculature and regulating hormones^{24,26}.

Besides stimulating autonomy, the use of occupational therapy is believed to improve mood, where exercise associated with social interaction, healthy diet and good sleep hygiene are recommended. However, reducing sedentary behavior hinges on other factors, such as the motivation to do so^{25,27}.

COVID viewed as trivial

A number of participants demonstrated a lack of concern with the pandemic and, in some cases, no awareness of the seriousness of COVID-19, as illustrated in the statements below:

“I even said it, I said it was rubbish. We had to remain confined, right? I said: no, that’s nonsense. God calls the shots. Did God not come here and say this? It’s he who sorts it out, God calls the shots.” (Resident 5)

“Ah me.. No, I didn’t like .. I didn’t like, give it much thought [...] I said it’s God’s will, right?” (Resident 9)

These accounts pertain to older adults residing in LTCFs, places with a high concentration of aged individuals and a higher level of frailty who are exposed to the entry and exit of people and materials on a daily basis, with a consequent substantially greater risk of exposure to the virus in this population. Furthermore, on both a national and global scale, institutionalized older adults were the main target of COVID-19, with a high number of infected residents who died as a result of the disease⁸

The findings for this category are consistent with a study of institutionalized older adults in a city located in Paraná State, where misinformation and a lack of interest regarding the impact of the pandemic were evident. These results highlighted that, although aware of the global crisis, little meaningful change was made in the daily routine of residents in response to the events involving COVID-19 outside the facilities. This poor response might be due to the low exposure to communication channels within the LTCFs²⁸.

Also, the COVID-19 “infodemic” to which the non-institutionalized older population was exposed meant they felt a much greater impact of the information conveyed, especially via social media platforms, triggering different negative psychological responses, such as depression, stress, anguish, anxiety, sadness and fear²⁸.

In this sense, the lack of concern over the pandemic exhibited by the residents proved a protective factor for the psychological response cited above. In these cases, religiosity served as a source of support amid the lack of concern with the disease and for coping with critical life events²⁹. However, it is important to stress that there should be a balance between prophylaxis and lack of concern with the disease⁸.

CONCLUSION

The reports of residents revealed that social isolation had a negative impact on the mental health of the older adults studied, exacerbating feelings of sadness, fear, loneliness, anxiety, concern, agitation, and upset experienced by these individuals.

In this context, the study showed that the period of isolation during the pandemic served to highlight the challenge faced by institutionalized older adults of living isolated lives, irrespective of the occurrence of the pandemic.

Amid this scenario, strategies for improving social interaction and preserving mental health were identified: engaging in spirituality, encouraging physical activity, ADLs and IADLs, digital inclusion of older adults, and practice of occupational therapy.

Limitations of this study include the fact that data collection was performed only for residents of two philanthropic LTCFs. This limitation precludes generalization of the study findings to other institutionalized older adults in the city. Future studies of this nature including private LTCFs are suggested.

Lastly, the results of the present study help further understanding on the impacts of social isolation on the lives and mental health of institutionalized older individuals. The findings also contribute to

discussions and reflections on better strategies for managing the social and health needs arising from the pandemic. In the context of gerontological nursing, the study underscores the importance of providing better strategies for addressing mental health and social interaction among LTCF residents to mitigate the consequences of social isolation in this population.

AUTHOR CONTRIBUTIONS

- Iasmin Narciso – Conception, data collection, analysis, interpretation and writing.
- Flávia de Oliveira – Interpretation and critical review
- Silmara Nunes Andrade – Interpretation and critical review.
- Kellen Rosa Coelho – Conception, analysis, interpretation, writing and supervision.

Edited by: Marquiony Marques dos Santos

REFERENCES

1. Brasil. Instituto Brasileiro de Geografia e Estatística. Projeção da população do Brasil e das Unidades da Federação. IBGE [online].2023. Available from: <https://www.ibge.gov.br/apps/populacao/projecao/>.
2. Figueiredo AEB, Ceccon RF, Figueiredo JHC. Doenças crônicas não transmissíveis e suas implicações na vida de idosos dependentes. *Ciênc saúde coletiva*. 25 de janeiro de 2021; 26:77–88. Available from: <https://doi.org/10.1590/1413-81232020261.33882020>.
3. Lopes VM, Scofield AMT dos S, Alcântara RKL de, Fernandes B karen C, Leite SFP, Borges CL. O que levou os idosos à institucionalização? *Revista de Enfermagem UFPE on line*. 8 de setembro de 2018;12(9):2428–35. Available from: <https://doi.org/10.5205/1981-8963-v12i9a234624p2428-2435-2018>.
4. Pascotini F dos S, Fedosse E. Percepção de estagiários da área da saúde e trabalhadores de Instituições de Longa Permanência de Idosos sobre a institucionalização. *ABCS Health Sciences*. 2 de agosto de 2018;43(2). Available from: <https://doi.org/10.7322/abcshs.v43i2.1026>.
5. Holmes EA et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *The Lancet Psychiatry*. 2020;7(6):547-560. Available from: [https://doi.org/10.1016/S2215-0366\(20\)30168-1](https://doi.org/10.1016/S2215-0366(20)30168-1).
6. Brasil. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. Resolução de diretoria colegiada - RDC nº 502, de 27 de maio de 2021. Dispõe sobre o funcionamento de Instituição de Longa Permanência para Idosos, de caráter residencial. ANVISA. Brasília, DF: Ministério da Saúde; 2021.

7. Verbeek H, Gerritsen DL, Backhaus R, de Boer BS, Koopmans RTC, Hamers JPH. Allowing Visitors Back in the Nursing Home During the COVID-19 Crisis: A Dutch National Study Into First Experiences and Impact on Well-Being. *J Am Med Dir Assoc*. 2020;21(7). Available from: <https://doi.org/10.1016/j.jamda.2020.06.020>.
8. Moraes EN, Viana LDG, Resende LMH, Vasconcellos LDS, Moura AS, Menezes A. COVID-19 nas instituições de longa permanência para idosos: estratégias de rastreamento laboratorial e prevenção da propagação da doença. *Cienc Saude Colet*. 2020;25(9):3445-3458. Available from: <https://doi.org/10.1590/1413-81232020259.20382020>.
9. Nehme J, Borghesan M, Mackedenski S, Bird TG, Demaria M. Cellular senescence as a potential mediator of COVID-19 severity in the elderly. *Aging Cell*. 21 de setembro de 2020;19(10). Available from: <https://doi.org/10.1111/acel.13237>.
10. Riello M, et al. Prevalence of post-traumatic symptomatology and anxiety among residential nursing and care home workers following the first COVID-19 outbreak in Northern Italy. *R Soc Open Sci*. 2020;7(9). Available from: <https://doi.org/10.1098/rsos.200880>.
11. Sano M, Lapid MI, Ikeda M, Mateos R, Wang H, Reichman WE. Psychogeriatrics in a world with covid-19. *Int Psychogeriatr*. 17 de junho de 2020;32(10). Available from: <https://doi.org/10.1017/S104161022000126X>.
12. Eduardo OM et al. Impactos da pandemia da Covid-19 no autocuidado de idosos: Uma revisão integrativa. *Research, Society and Development*. 2021;10(3). Available from: <https://doi.org/10.33448/rsd-v10i3.13672>.
13. Silva VN et al. Pandemia de covid-19 nas instituições de longa permanência para idosos: o papel da extensão universitária. *Revista Sinapse Múltipla*. 4 de janeiro de 2022;10(2):395-401. Available from: <https://periodicos.pucminas.br/index.php/sinapsemultipla/article/view/23944>.
14. Coutinho VV, Mendonça ET, Diaz FBBS, Amaro MOF, Siman AG. Experiências de enfrentamento da COVID-19 em Instituições de Longa Permanência para Idosos. *Medicina (Ribeirão)* 2023;56(2). Available from: <http://dx.doi.org/10.11606/issn.2176-7262.rmrp.2023.199808>.
15. Souza DGD, Brandão VP, Martins MDN, Morais JAVD, Jesus NOD. Teorias de enfermagem: Relevância para a prática profissional na atualidade. Campo grande: Editora Inovar; 2021. 56p. Available from: <https://educapes.capes.gov.br/handle/capes/642889>.
16. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care*. 2007;19(6):349-357. Available from: <https://doi.org/10.1093/intqhc/mzm042>.
17. Brasil. Rede Telessaúde Brasil. Mini Exame do Estado Mental (MEEM) (online). Brasil: Ministério da Saúde, 2023. Available from: <https://aps.bvs.br/apps/calculadoras/?page=11>.
18. Bardin L. Análise de conteúdo. Edição 70, 2011.
19. Figueiredo MC, Filho JMC. Feelings aroused during the COVID-19 pandemic in the elderly accompanied by the Family Health Strategy. *Res Soc Dev*. 2022;11(13). Available from: <https://rsdjournal.org/index.php/rsd/article/view/35235>.
20. Romero DE, Muzy J, Damascena GN, Souza NAD, Almeida WDS, Szwarcwald CL, et al. Idosos no contexto da pandemia da COVID-19 no Brasil: efeitos nas condições de saúde, renda e trabalho. *Cad Saude Publica*. 2021;37(3). Available from: <https://doi.org/10.1590/0102-311X00216620>.
21. Oliveira AS, Lopes AOS, Santana EDS, Gobira NCMS, Miguens LCDP, dos Reis LA, et al. Representações sociais de idosos sobre a COVID-19: análise das imagens publicadas no discurso midiático. *Rev Kairós-Gerontol*. 2020;23(Número Temático Especial 28, "COVID-19 e Envelhecimento"):461-477. Available from: <https://revistas.pucsp.br/index.php/kairos/article/view/51564/33667>.
22. Comas-Herrera A, Zalakaín J, Lemmon E, Henderson D, Litwin C, Hsu AT, et al. Mortality associated with covid-19 outbreaks in care homes: early international evidence. *International LongTerm Care Policy Network*. 12 de abril de 2020;2020 Apr 12. Available from: <https://ltccovid.org/2020/04/12/mortalityassociated-with-covid-19-outbreaks-in-care-homes-early-internationalevidence/>.
23. Bezerra PA, Nunes JW, Moura LBDA. Envelhecimento e isolamento social: uma revisão integrativa. *Acta Paul Enferm*. 2021;34. Available from: <https://acta-ape.org/en/article/aging-and-social-isolation-an-integrative-review/>.
24. Soares JDS, Ferreira JSDC, Araújo-Monteiro GKN, Souto RQ, Braga JEF. Avaliação do estado cognitivo e capacidade funcional em pessoas idosas institucionalizadas. *Rev Enferm UERJ*. 2021;29. Available from: <https://www.e-publicacoes.uerj.br/index.php/enfermagemuerj/article/view/59240/40488>.
25. Voss ML, Pope JP, Copeland JL. Reducing Sedentary Time among Older Adults in Assisted Living: Perceptions, Barriers, and Motivators. *Int J Environ Res Public Health*. 2020;17(3):717. Available from: <https://doi.org/10.3390/ijerph17030717>.

26. Bezerra PCDL, Lima LCRD, Dantas SC. Pandemia da covid-19 e idosos como população de risco: aspectos para educação em saúde. *Cogitare Enferm.* 2020;25. Available from: <https://revistas.ufpr.br/cogitare/article/view/73307>.
27. Alvarado AY, García KJJ, Maldonado KM, Ochoa Lara L. Terapia ocupacional e humor do idoso em duas enfermeiras do departamento de Cortés. *Rev Cient Esc Univ Cienc Saude.* 2019;6(2):12-16. Available from: 10.5377/rceucs.v6i2.9760. Available from: <https://www.camjol.info/index.php/RCEUCS/article/view/9760>.
28. Batista GM, Lorencete TV, Catelan-Mainardes SC. A importância da socialização para a saúde mental do idoso. *Enciclopédia Biosfera.* 15 de dezembro de 2022;19(42): 20. Available from: <https://conhecer.org.br/ojs/index.php/biosfera/article/view/5585.22v>.
29. Júnior WL, Paiva EM das C, Cardoso AB dos A, Costa ICP, Ferreira EB, Bressan VR, Rezende EG. Religiosidade/espiritualidade entre a população brasileira diante da pandemia covid-19 e a correlação com a qualidade de vida. *Arquivos de Ciências da Saúde da UNIPAR.* 2023; 27:948-966. Available from: <https://doi.org/10.25110/arqsaude.v27i2.2023-024>.




Development and content validation for a self-assessment instrument of care quality in long-term care facilities for older adults

Bruno Luís de Carvalho Vieira¹ 

Ariane Correa Martins¹ 

Raquel Conceição Ferreira¹ 

Andréa Maria Duarte Vargas¹ 

Abstract

Objective: To develop and validate the content of a self-assessment instrument for the quality of care in Long-Term Care Facilities for Older Adults (Instituições de Longa Permanência para Idosos - ILPIs), named QualificaILPI. **Method:** A methodological study conducted between March and December 2021. The instrument was developed based on a multidimensional quality model, Brazilian legislation, and literature research. It contains quality standards for self-assessment of ILPIs in the dimensions of environment, home, care, family and community involvement, work team, and management. Each standard is described and followed by a scale with parameters to classify the level of ILPI quality as incipient, intermediate, or consolidated. The modified Delphi Technique was employed for validation by a committee of 10 experts regarding the relevance of the standard for ILPI quality assessment, the appropriateness of objectives, the evaluation scale, and clarity, allowing for comments. The standard was retained when there was 75% agreement among the experts. The instrument was also evaluated by the target audience, consisting of coordinators from 10 ILPIs selected for convenience. **Results:** In the first assessment cycle, three standards were excluded, and two new ones were created. In the second cycle, the dimension of one standard was changed, and two standards were combined. In the end, 29 standards remained, divided into six dimensions. The target audience, ILPI managers, suggested changes in the wording of some standards. There was a consensus of 80% or higher for all standards. **Conclusion:** QualificaILPI has the potential to contribute to monitoring ILPIs, promoting the improvement of care offered to residents.

Keywords: Delphi Technique. Long-Term Care. Aged. Self-Assessment. Quality of Healthcare.

¹ Universidade Federal de Minas Gerais, Faculdade de Odontologia, Departamento de Odontologia Social e Preventiva, Programa de Pós-graduação em Odontologia. Belo Horizonte, MG, Brasil.

Funding: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) – Brasil – 001. Raquel Conceição Ferreira receives financial support from the “Programa Pesquisador Mineiro” (FAPEMIG: PPM-00603-18) and is a CNPq Research Productivity Fellows (310938/2022-8).

The authors declare that there is no conflict in the conception of this work.

Correspondence
Raquel Conceição Ferreira
raquelcf@ufmg.br

Received: August 01, 2023
Approved: November 28, 2023

INTRODUCTION

The aging process may be accompanied by an increased need for assistance in daily activities. When families are unable to provide this support, Long-Term Care Facilities for Older Adults (Instituições de Longa Permanência para Idosos - ILPIs) become alternatives to deliver such care. ILPIs are collective residential settings, whether governmental or private, that provide healthcare assistance and activities aimed at maintaining clinical and functional conditions¹. There is a global trend of an increase in this type of residence², with the number varying according to the country and local culture. The population residing in such institutions constitutes approximately 0.5% of the older population in Brazil, 9% in the United States, and 6% in France³.

Factors contributing to the use of these residences include the dependence of older individuals, financial difficulties within the family, absence of a caregiver at home, changes in family dynamics due to all family members working, and family conflicts⁴. As it is not a natural process, the transition to a collective living environment can negatively impact the lives and health of older individuals⁵. In this perspective, ILPIs should develop initiatives that promote the well-being and quality of life of older adults, encouraging the maintenance of cognition, independence, and physical capacity⁶.

To ascertain whether these initiatives are being implemented, the assessment of ILPIs has become an encouraged and recognized practice in many countries, contributing to the implementation of social policies⁷. In Brazil, legislation regulates the operation of ILPIs, defining minimum standards for organization, human resources, infrastructure, operational processes, health, food, cleanliness, laundry, clothing processing, and storage^{8,9}. The health surveillance conducts external evaluation processes with the objective of inspection, in accordance with established norms. However, systematic internal evaluation processes that facilitate the identification of issues, planning, and decision-making by those involved in the daily care of older adults have not been identified^{9,10}.

The assessment of ILPIs is a complex issue that must be theoretically conceptualized and guided.

One of the many existing tools for evaluation, called "Observable Indicators of Nurse Home Care Quality", utilizes the Integrated Multidimensional Model of Quality and Person-Centered Care and contains seven quality dimensions¹⁰. However, for the most part, these tools either do not employ a conceptual model, are not specifically designed for ILPIs, or do not incorporate the perceptions of older adults, staff, managers, and family members in a comprehensive assessment¹⁰.

For a comprehensive evaluation, it is presupposed that tools supporting the assessment process should be utilized. This process should be conducted continuously by individuals closely associated with the ILPI to enable care planning and improvements in structure and work processes. In this context, the aim of this study was to develop and validate the content of a self-assessment instrument for care quality in ILPIs based on a multidimensional assessment model.

METHOD

This is a methodological study conducted between March and December 2021, aimed at creating and validating the content of a self-assessment instrument for care quality in ILPIs, named QualificaILPI. The stages of its development are illustrated in Figure 1. In its construction, models of care quality in ILPIs and Brazilian legislation were taken into account, in addition to a literature review.

The adopted conceptual models were the ILPI quality model developed by Figueiredo et al.¹¹ and the multidimensional quality model of care in ILPIs by Rantz et al.¹². Figueiredo et al.¹¹ defined ILPI quality as related to the environment, provided care, team and work processes, status, family, and community through qualitative research using unstructured interviews. According to Rantz et al.¹², care quality is multidimensional, encompassing aspects related to the team, care, family involvement, communication, environment, domicile, and cost. The theoretical model of Donabedian¹³ was also employed for health service evaluation to define the work process and structure to be assessed by the instrument. The structure involves material, human, and organizational resources that favor work

processes related to care activities¹³. These models were chosen based on a scoping review of existing models to guide ILPI care evaluation¹⁰. Additionally, the legal framework used was Resolution of the

Collegiate Board, number 502, dated May 27, 2021 (Resolução de Diretoria Colegiada - RDC 502/2021), from the National Health Surveillance Agency, which governs the operation of ILPIs⁸.

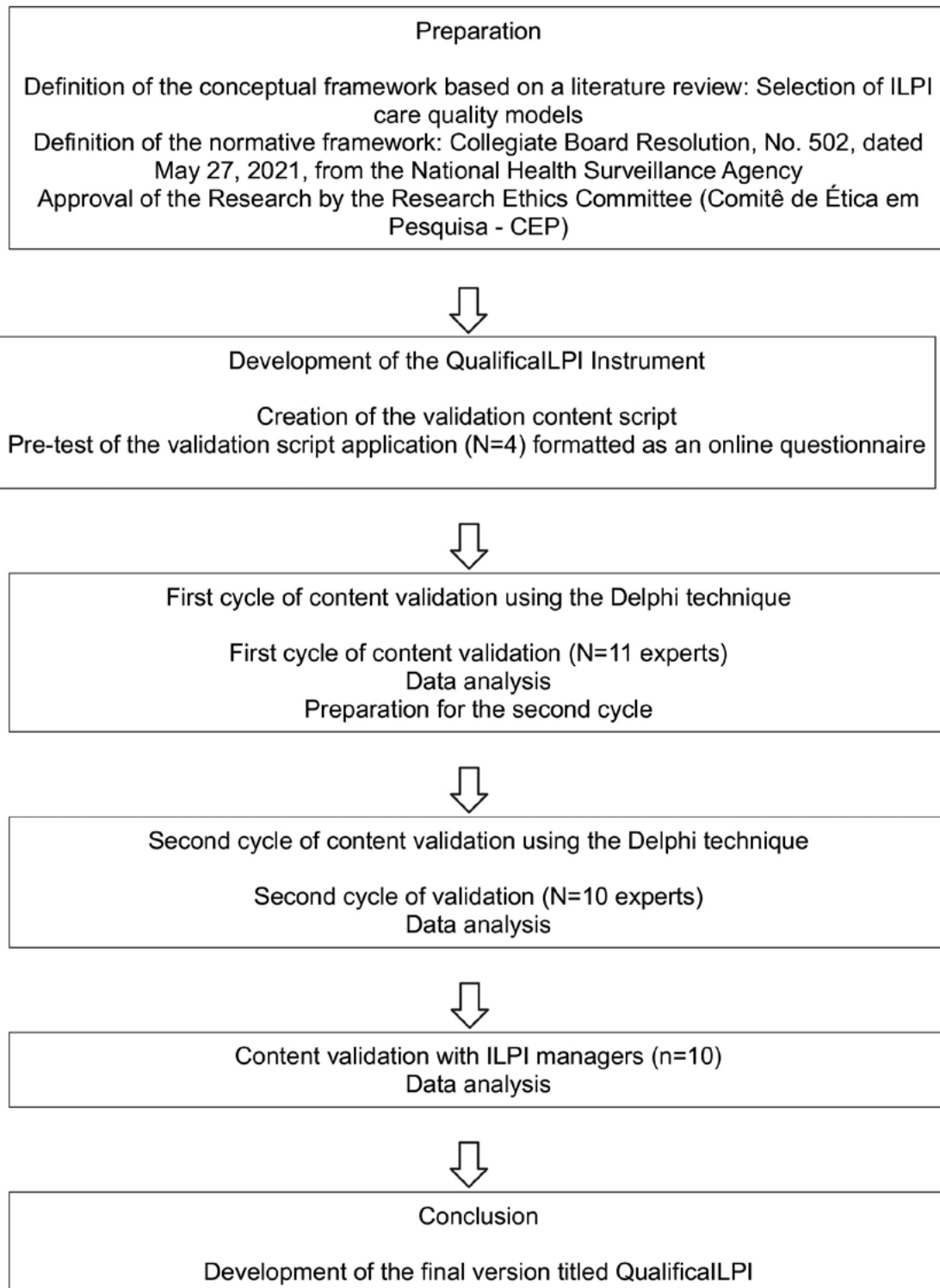


Figure 1. Stages of content validation for the self-assessment instrument of care quality in ILPIs (QualificaILPI). Belo Horizonte, MG, 2021.

The instrument comprises quality standards, defined based on literature or legislation, related to the structure and work processes in the dimensions of environment, work team, care, home, family and community involvement, and management of the ILPI. The concepts of these dimensions are presented in Chart 1. For the assessment of each standard, there is a scale to indicate its level of quality, ranging from absent, incipient, intermediate to consolidated. This

scale varies for each standard. The criteria used for constructing the scale were based on previous studies or referenced the Brazilian legal framework. Statistical criteria, quartiles, and terciles were employed when none of the conditions were available. The instrument was presented in a descriptive sheet containing the conceptualization of the assessed quality dimension, a description of each developed standard, objectives, justification, and a self-assessment scale.

Chart 1. Concepts of the dimensions evaluated by the self-assessment instrument of care quality in ILPIs. Belo Horizonte, MG, 2021.

Dimensions	Concepts
Environment	The concept of environmental docility was employed, referring to friendly spaces resulting from the provision of compensatory physical and psychosocial resources to promote the physical health, functionality, safety, residence identity, and psychological well-being of the resident. As the individual's abilities decline, and behavior becomes dependent on external factors, it becomes necessary to enhance the resident's environment to enable a more dignified, secure, and well-being-centered living experience ^{7,14} .
Work Team	It pertains to the team of professionals involved in providing care to older adults residing in ILPIs. It is essential to consider the technical requirements for each professional category, ensure the minimum number of professionals, establish ongoing education, and enhance the work process to ensure professional satisfaction and, consequently, better meet the needs of the residents ^{10,14,15} .
Care	Care encompasses any action aimed at meeting the basic needs of older adults, including promoting self-care, self-esteem, and self-appreciation. ILPIs should consistently care for older adults with respect and attentive listening, empathy, and encouragement of autonomy and independence whenever possible. Care is crucial for the quality of life and survival of older adults ^{14,15} .
Home	Older adults residing in ILPIs should feel as if they are in their own homes. With a welcoming environment, ILPIs should preserve habits, autonomy, safe social interaction, hygiene, health, accessibility, and privacy. When this occurs, the older adults perceives the staff as friends and family, feeling at home, participating in ILPI activities with freedom and privacy ^{14,16} .
Family and Community Involvement	The ideal scenario is to maintain older adults in their own family environment, but if that is not possible, a collective home is an option. Nonetheless, it is essential to maintain involvement with family and the community, promoting autonomy and quality of life. This interaction helps to preserve mental health, satisfaction, and independence ^{10,17} .
ILPI Management	The management of the ILPI encompasses administrative processes aimed at achieving outcomes, ensuring a better quality of life for older adults, based on regulations that must be followed and established by legislation ^{10,18} .

ILPI: Instituições de Longa Permanência para Idosos (Long-Term Care Facilities for Older Adults).

The instrument was initially subjected to a pre-test by four experts (faculty members in the field of geriatric health) to assess the adopted format, dimensions and their self-assessment standards, language, and potential inconsistencies.

A modified Delphi Technique¹⁴ was then used to validate the content of the self-assessment instrument, based on the Guidance on Conducting and Reporting Delphi Studies (CREDES)¹⁹. This technique involves an interactive consultation with experts who assess specific issues or subjects in evaluation cycles until consensus is reached. It was conducted through an anonymous structured group methodology, allowing the accumulation of contributions from experts with different experiences, ranging from research to frontline care for older adults. The experts were selected for their affinity with the topic and experience in elderly care¹⁴, including workers in ILPIs, researchers, or members of associations/institutions related to the research or protection and assistance of the elderly: Brazilian Society of Geriatrics and Gerontology (1), National Health Surveillance Agency (1), nurse managers from the Municipal Health Department (2), university professors (2), workers from the State Older Adults Coordination (2), and caregivers of older adults in ILPIs: occupational therapist (1), nutritionist (1), lawyer (1), and physiotherapist (1).

The validation script allowed experts to assess each standard of the self-assessment instrument regarding its relevance:

- 1) "Is the standard relevant for evaluating the quality of the ILPI?"
- 2) "Is the standard relevant for evaluating the proposed dimension?"

To answer these two questions, the experts chose one of the following options: the standard is indispensable, necessary, or dispensable. The experts also provided their opinions on the following questions: "Is the wording of the standard suitable for understanding its content?"; "Is the objective of the standard adequately described?"; and "Is the proposed rating scale suitable for measuring different levels of ILPI quality in terms of the evaluated standard?" The

experts selected one of the options: suitable, partially suitable, or unsuitable. Additionally, two open-ended questions allowed the experts to provide a wording suggestion to enhance clarity and understanding of the content or any other comments or suggestions regarding the standard.

The self-assessment instrument, validation script, and informed consent form were distributed to experts through an online Google Forms platform following their agreement to participate, which was previously confirmed through telephone contact. The obtained responses were analyzed and consolidated, generating an anonymous report provided in subsequent evaluation cycles, along with the self-assessment instrument revised based on received comments. Standards were retained in the instrument when a concordance rate of at least 75% among the experts was achieved²⁰, for all evaluated aspects. The percentage was calculated by the frequency of experts who responded positively (answer options: indispensable + necessary or suitable + partially suitable) to the aspects evaluated for each standard, separately.

Following this stage, the QualificaILPI instrument was printed and sent to ten managers of ILPIs, selected conveniently from five philanthropic and five private ILPIs, as potential users of the instrument. They were asked to assess the clarity of the standards, the utility of self-assessment for the ILPI, and whether the scale was suitable for differentiating the level of care quality in the ILPI. To assess clarity and scale adequacy, the options were yes or no. For utility, managers chose one of the following response options: always, sometimes, rarely, or never. When managers negatively assessed any aspect, they were asked to provide a justification for that evaluation. Additionally, there was space for comments and suggestions. Similarly, the percentage of agreement among managers on these issues was obtained by the frequency of those who responded positively (yes or sometimes + always).

The study was approved by the UFMG Research Ethics Committee (CAAE: 17002519.4.0000.5149) and all experts recorded their acceptance to participate in the research after reading the informed consent form.

The entire dataset supporting the results of this study is in another document, previously published and available at: <http://hdl.handle.net/1843/47720>²¹.

RESULTS

The initial version of the self-assessment instrument comprised 35 standards that assessed aspects of the structure and work process in six dimensions: environment, work team, care, home, family and community involvement, and management of the ILPI.

Two validation cycles were necessary to achieve consensus among experts regarding the proposed standards for the instrument. After the first cycle, one standard from the environmental dimension was excluded due to a concordance percentage <75%. The need for an ILPI-owned car for transporting older individuals, assessed by this excluded standard, was considered inappropriate by the experts. In the work team dimension, the presence of different categories of healthcare professionals, such as those employed in ILPIs, was deemed unnecessary and even inappropriate, as the perception is that the ILPI should be more like a home. Therefore, it was excluded, along with three standards related to medical, psychological, and dental care provided by the ILPI. If an older individual requires any of these professionals, an appointment should be scheduled, which can take place either outside or within the ILPI. A standard was created that encompasses oral health care, not just the provision of dental treatment. The standards on monitoring the health of the older person by the caregiver and the need for their records were modified and merged. Resident participation in decisions within the ILPI was moved to the Home dimension. The standard addressing the involvement of volunteers in home activities was transferred to the Community Involvement dimension and merged with the standard encouraging family presence in the ILPI. The standard on gardening was incorporated into the Environmental dimension's green area and garden. Changes in the wording of various standards were also made based on expert comments.

In the second validation cycle, the percentage of agreement among experts exceeded 75% for all standards. The experts also suggested including the evaluation of the caregiver's profile and the quality of the technical course for caregivers of older adults conducted by them. Additionally, they suggested changes related to the COVID-19 pandemic. However, these issues go beyond the objectives of the self-assessment instruments. Evaluating the caregiver's profile requires specific knowledge, and the quality of the caregiver course is independent of the ILPI, as it is regulated by the Ministry of Education. Moreover, it was recommended to consider the extraordinary situation of the pandemic and adopt necessary changes as long as needed. Other suggestions regarding wording and content were accepted and enhanced the standards. The percentages of agreement among experts for the content validation aspects of the standards are presented in Table 1.

In the evaluation of the instrument by the target audience, the percentage of agreement among managers was above 80% for all aspects assessed and all standards. Managers considered that Standard 5 in Dimension 3 (Care) and Standard 3 in Dimension 6 (Management) would be "rarely" useful for ILPIs. Standard 5 refers to the prevention of violence, starting from the care dimension. The justification provided for this response did not consider violence as an expected situation within the ILPI, but it is known to exist and requires attention. The other standard evaluates the participation of managers and professionals from the health unit near the ILPI in the elaboration of the health plan. It was argued that this does not happen in the ILPI's daily routine, but it is a requirement of Brazilian legislation and should be encouraged as it promotes integration between the ILPI and health units. Regarding the adequacy of the evaluation scale, all standards obtained agreement above 80% (Table 2).

The final self-assessment instrument included 29 out of the initial 35 standards distributed across six dimensions (Table 3). The complete version of the QualificaILPI instrument, including scales and evaluation parameters, is available in the supplementary file: <http://hdl.handle.net/1843/47720> ²¹.

Table 1. Percentage of agreement among experts in the first and second validation cycles of standards in terms of relevance for assessing ILPI quality, relevance for dimension assessment, understanding, adequacy of the objective, and evaluation scale (number of experts in the first cycle: 11; in the second: 10). Belo Horizonte, MG, 2021.

Dimensions	Aspects evaluated by experts in the two validation cycles									
	Relevance of the standard for assessing the quality of long-term care		Relevance of the standard for dimension assessment		Proper understanding		Proper description of the purpose of the pattern		Proper scale	
	Cycle 1	Cycle 2	Cycle 1	Cycle 2	Cycle 1	Cycle 2	Cycle 1	Cycle 2	Cycle 1	Cycle 2
Environment										
Standards										
1	90.9	100	90.9	100	90.9	100	81.2	100	81.2	100
2	100	100	90	100	81,8	100	72.7*	100	63.6*	100
3†	100	90	100	90	100	100	100	100	100	100
4	100	100	100	100	100	100	100	100	100	100
5‡	72.8*		72.8*		72.8*		81.8		72.8*	
6	90.9	100	81.8	100	90.9	100	90.9	100	90.9	100
Work Team										
Standards										
1‡	90.9		90.9		100		100			
1	90.9	100	90.9	100	90.9	100	100	100	100	100
2	90.9	100	100	100	100	100	100	100	100	100
3	100	100	100	100	90.9	100	100	90	90.9	100
4	100	100	100	100	100	100	100	100	100	100
5	100	100	100	100	100	100	100	100	100	100
Care										
Standards										
1	100	100	100	100	100	100	100	100	100	100
2	100	100	100	100	100	100	100	100	100	100
3	90.9	100	90.9	90	90.9	100	90.9	100	100	100
4§	100	100	100	100	100	100	100	100	100	100
5	100	100	100	100	100	100	100	100	100	100
6	100	100	100	100	100	100	100	100	100	100
7	90.1	100	90.1	90	100	100	100	100	100	100
8	100	100	90.1	100	100	100	100	100	100	100
9° §	90.1		81.8		90.1				100	
10	100		90.1		100		100		100	
9	81.8	100	81.8	90	199	100	100	100	100	90
11‡	81.8		81.8		100		100		100	
12‡	90.1		90.1		100		100		100	
13‡	81.8		81.8		100		100		100	
9		100		100		100		100		100
10		100		90		100		100		90

to be continued

Continuation of Table 1

Dimensions	Aspects evaluated by experts in the two validation cycles									
	Relevance of the standard for assessing the quality of long-term care		Relevance of the standard for dimension assessment		Proper understanding		Proper description of the purpose of the pattern		Proper scale	
Environment	Cicle 1	Cicle 2	Cicle 1	Cicle 2	Cicle 1	Cicle 2	Cicle 1	Cicle 2	Cicle 1	Cicle 2
Home Standards										
1	90.9	90	90.9	90	90.9	90	90.9	100	81.8	100
2 **	100	90	100	90	100	100	100	100	100	100
3	90.9	90	90.9	90	100	100	100	100	100	100
4	81.8		81.8		100		100		100	
3 †		90		90		100		100		100
Family and Community Involvement Standards										
1 **	81.8	100	81.8	100	100	100	100	100	100	100
2	90.9	100	90.9	100	100	100	100	100	100	100
ILPI Management Standards										
1	100	100	100	100	100	100	100	100	100	100
2	100	100	100	100	100	100	100	100	100	100
3	81.8	90	81.8	90	100	100	100	100	100	100
4	100	100	100	100	100	100	100	100	100	100

ILPI: Instituições de longa permanência para idosos (Long-Term Care Facilities for Older Adults); * Percentage of agreement among experts <75%; † Part of the standard moved to another dimension (3 to 3); ‡ Excluded standards; § Standards merged in the same dimension (4 and 9); || Standard moved to another dimension (10 and 3); ** Standards combined in different dimensions (2 and 1).

Table 2. Percentage of agreement among ILPI managers (n=10) regarding the clarity of standards, their usefulness for self-assessment, and the adequacy of the scale to differentiate the quality of care in the ILPI. Belo Horizonte, MG, 2021.

Standards	Clarity of standards (%) Yes	Usefulness of self-assessment for ILPIs (% always and sometimes)		Adequacy of the instrument to differentiate the levels of quality of care in the ILPI (% yes)
		Always	Sometimes	
Aspects evaluated by managers				
Dimension 1: Environment				
1	100	100		90
2	100	100		80
3	90	100		100
4	100	80	20	100
5	100	80	20	90
Dimension 2: Work Team				
1	100	100		100
2	100	90	10	100
3	100	90	10	80
4	100	90	10	100
5	100	90	10	90
Dimension 3: Care				
1	100	90	10	90
2	100	90	10	100
3	100	80	20	90
4	100	90	10	100
5	100	80	20	90
6	100	90	10	100
7	100	80	20	100
8	90	90	10	90
9	100	90	10	100
10	100	80	20	100
Dimension 4: Home				
1	100	90	10	100
2	100	80	20	90
3	100	70	30	90
Dimension 5: Community Family Involvement				
1	100	80	20	100
2	100	80	20	90
Dimension 6: Management				
1	100	70	30	80
2	100	70	30	80
3	90	70	30	80
4	100	80	20	100

ILPI: Instituições de Longa Permanência para Idosos (Long-Term Care Facilities for Older Adults).

Table 3. Dimensions and aspects addressed by the quality standards of the self-assessment instrument for care quality in ILPI - QualificaILPI. Belo Horizonte, MG, 2021.

Standards	Dimension 1: Environment
1	Mobility and safety issues
2	Adequacy of bedrooms
3	Common area, green area, internet access
4	Appropriate location for medications
5	Cleanliness and hygiene (presence of odors)
	Dimension 2: Work Team
1	Adequate number of caregivers considering the resident's level of dependency
2	Technical supervisor
3	Caregivers with training courses
4	Continuous education
5	Team meetings
	Dimensão 3: Care
1	Proper nutrition
2	Technical standards and routines for food processing
3	Medical care plan
4	Individualized resident registry
5	Prevention of violence
6	Physical activities
7	Recreational and cultural activities
8	Occupational activities
9	Daily dental care, including denture cleaning
10	Healthcare
	Dimension 4: Home
1	Intergenerational activities
2	Consideration of resident preferences
3	Participation in household decisions
	Dimension 5: Family and Community Involvement
1	Encouraging family and community participation
2	Integration with educational institutions
	Dimension 6: Management
1	Use of indicators to monitor performance
2	Discussion of monitoring with collaborators
3	Public health participation in planning
4	Strategies to avoid professional turnover

DISCUSSION

The QualificaILPI instrument demonstrated content validity, as confirmed by experts, and was deemed clear and useful by managers and professionals in contributing to the self-assessment process of the quality of care in long-term care facilities for older adults. The validation process involving both experts and the target audience contributed to enhancing the quality of the developed instrument²⁰.

The number of experts involved and the validation cycles were conducted according to the description of the technique, recommending five to ten experts with a strong domain of the subject¹⁴. The consensus method allowed for the synthesis of information from experts who freely expressed their positions and impressions about the instrument under construction without the presence of others, reducing the risk of bias. Finally, modifications and necessary changes were suggested by all experts^{14,22}.

The QualificaILPI innovates as a self-assessment instrument that includes standards related to the participation of older adults in ILPI activities; the existence of partnerships with educational institutions and the involvement of people of all ages in the routine of ILPI, enabling intergenerational interaction; the inclusion of oral health care, which can prevent health issues; and the prevention of violence²¹. The standards encompass important aspects for the health, well-being, and quality of life of older adults. The need for ILPI to resemble a home was taken into account, without forgetting the importance of meeting the health and stimulation needs of older adults for the maintenance and recovery of their health.

The environmental dimension encompasses structural aspects that allow privacy, space for socialization, comfort, and safety, preventing accidents and favoring work processes, as seen in other studies^{12,23}. The work team dimension addresses ILPI workers, including caregivers, who must be trained and motivated, essential for quality care^{12,13,24}. The care dimension evaluates aspects such as nutrition^{6,25}, and physical activity, which is important for social interaction with other residents, maintaining health, and independence^{6,24,26,27}. It also includes the assessment of individualized care plans³,

preventing hospitalizations and maintaining oral health to avoid excess biofilm that may be related to respiratory pneumonia²⁸. Additionally, it aims to prevent violence, which can lead to negative psychological consequences affecting health and well-being¹⁶.

The home dimension aims to assess whether the ILPI is as close as possible to a home, ensuring that residents participate in some decisions, preserving their habits and autonomy, promoting health and well-being^{12,17}. The fifth dimension, family and community involvement, evaluates whether these relationships are being encouraged and allowed in the broadest possible way for better mental health and quality of life. Partnerships with educational institutions to increase social interaction and cognitive and physical stimulation should also be considered¹⁶, along with contact with people from other generations²⁹. The last dimension assesses management, which must be well-planned with adequate oversight for the functioning of the ILPI^{8,20,30,31}.

There are some limitations to consider in this study. Firstly, the Delphi technique does not allow face-to-face or group interaction among participants, limiting the exchange of information, although it promotes greater freedom and autonomy in assessments. Additionally, the lengthy duration of the validation process, which can extend over several months until all responses are obtained, is a challenge^{32,33}. Defining assessment scales was complex, as parameters for defining ILPI quality were not always available (in the literature or normative documents), and some were based on statistics. It is important to note that this study focuses exclusively on the content validation of the instrument by experts, while future research should evaluate its psychometric properties and dimensionality. Although differences in ILPIs in different contexts are acknowledged, the concepts adopted for defining quality can be broadly applicable, especially regarding elements such as family contact and the sense of belonging to a home. This self-assessment instrument, covering various dimensions, provides an opportunity for those responsible for the management and care of older adults to analyze various aspects of ILPI functioning and practices. This includes structural and management issues, teamwork, and the relationship

between ILPIs, older adults, and their families, as well as community involvement. The implementation of the self-assessment process allows for continuous monitoring of care quality, contributing to the well-being of all involved, in line with World Health Organization (WHO) recommendations emphasizing the importance of ILPI assessment^{21,31,34,35}.

CONCLUSION

The QualificaILPI self-assessment instrument demonstrated content validity and was deemed valuable for evaluating the level of care quality in ILPIs concerning multidimensional quality standards. This self-assessment tool stands as a potent and innovative resource that coordinators of ILPIs, managers, and professionals can deploy in various capacities. It facilitates ongoing monitoring of service quality within these institutions, serving as a guide in meetings with staff, managers, and residents, aiding in planning and decision-making. Self-assessment plays a pivotal role in contributing to continuous surveillance and monitoring. It can also highlight areas that could be enhanced to elevate the quality of care provided to older adults. The obtained results can be utilized for longitudinal comparisons over time, enabling an analysis of performance trends against established standards.

REFERENCES

- Sanford AM, Orrell M, Tolson D, Abbatecola AM, Arai H, Bauer JM, et al. An International Definition for “Nursing Home.” *J Am Med Dir Assoc*. 2015 Mar;16(3):181–4. Available at: <https://doi/10.1016/j.jamda.2014.12.013>.
- Berete F, Demarest S, Charafeddine R, De Ridder K, Vanoverloop J, Van Oyen H, et al. Predictors of nursing home admission in the older population in Belgium: a longitudinal follow-up of health interview survey participants. *BMC Geriatr*. 2022 Oct 20;22(1):807. Available at: <https://doi.org/10.1186/s12877-022-03496-4>
- del Campo Cervantes JM, Macías Cervantes MH, Monroy Torres R. Effect of a Resistance Training Program on Sarcopenia and Functionality of the Older Adults Living in a Nursing Home. *J Nutr Health Aging*. 2019 Nov 27;23(9):829–36. Available at: <https://doi.org/10.1007/s12603-019-1261-3>
- Kojima G. Frailty as a Predictor of Nursing Home Placement Among Community-Dwelling Older Adults: A Systematic Review and Meta-analysis. *J Geriatr Phys Ther*. 2018 Jan;41(1):42–8. Available at: <https://doi.org/10.1519/JPT.0000000000000097>.
- Medeiros PA de, Fortunato AR, Viscardi AA da F, Sperandio FF, Mazo GZ. Instrumentos desenvolvidos para o gerenciamento e cuidado de idosos em instituições de longa permanência: uma revisão sistemática. *Cien Saude Colet*. 2016 Nov;21(11):3597–610. Available at: <https://doi.org/10.1590/1413-812320152111.09912015>
- Chang Y-H, Wu I-C, Hsiung CA. Reading activity prevents long-term decline in cognitive function in older people: evidence from a 14-year longitudinal study. *Int Psychogeriatrics*. 2021 Jan 5;33(1):63–74. Available at: <https://doi.org/10.1017/S1041610220000812>

ACKNOWLEDGMENTS

We express our gratitude to all the experts and managers who contributed to the development of this instrument.

AUTHORSHIP

- Bruno Luís de Carvalho Vieira – conception, design, data analysis and interpretation, paper writing, and critical revision; approval of the final version to be published.
- Arianne Correa Martins - data analysis and interpretation, critical revision, and approval of the final version to be published.
- Raquel Conceição Ferreira – conception, design, data analysis and interpretation, paper writing, and critical revision; approval of the final version to be published.
- Andréa Maria Duarte Vargas – conception, design, data analysis and interpretation, paper writing, and critical revision; approval of the final version to be published.




Edited by: Marquiony Marques dos Santos

7. Iijima K, Arai H, Akishita M, Endo T, Ogasawara K, Kashihara N, et al. Toward the development of a vibrant, super-aged society: The future of medicine and society in Japan. *Geriatr Gerontol Int*. 2021 Aug;21(8):601–13. Available at: <https://doi.org/10.1111/ggi.14201>
8. Agência Nacional de Vigilância Sanitária. Resolução da Diretoria Colegiada - RDC nº 502, de 27 de maio de 2021. Dispõe sobre o funcionamento de Instituição de Longa Permanência para Idosos, de caráter residencial. 2021. Available at: http://bibliotecadigital.anvisa.ibict.br/jspui/bitstream/anvisa/423/1/RDCn531_04.08.2021_publicada06.08.2021_versão%20web.pdf.
9. Neumann LTV, Albert SM. Aging in Brazil. *Gerontologist*. 2018 Jul 13;58(4):611–7. Available at: <https://doi.org/10.1093/geront/gny019>
10. Vieira BL de C, Martins AC, Ferreira RC, Vargas AMD. Quality of care in long-term care institutions: A scoping review of literature. *Res Soc Dev*. 2021 Jul 10;10(8):e17110817117. Available at: <https://doi.org/10.33448/rsd-v10i8.17117>.
11. Figueiredo, AFP, Chiari, APG, Senna, MIB, de Figueiredo, IL, Vargas, AMD, & Ferreira, RC. Mapping a quality model for homes for the aged. *Rev Kairos*. 2020;23(2):435-56. Available at: <https://doi.org/10.23925/2176-901X.2020v23i2p435-456>.
12. Rantz MJ, Zwygart-Stauffacher M, Popejoy L, et al. Nursing home care quality: A multidimensional theoretical model integrating the views of consumers and providers. *J Nurs Care Qual*. 1999 Oct 1;14(1):16-37. Available at: <https://doi.org/10.1097/00001786-199910000-00004>.
13. Donabedian A. The quality of care: how can it be assessed?. *JAMA*. 1988;260(12):1743-8. Available at: <https://doi.org/10.1001/jama.1988.03410120089033>.
14. Jones J, Hunter D. Qualitative Research: Consensus methods for medical and health services research. *BMJ*. 1995 Aug 5;311(7001):376–80. Available at: <https://doi.org/10.1136/bmj.311.7001.376>.
15. Buedo-Guirado, C, Rubio, L, Dumitrache, CG, and Romero-Coronado, J. Active aging program in nursing homes: Effects on psychological well-being and life satisfaction. *Interv Psicosoc*. 2020; 29(1):49-57, 2020. Available at: <https://doi.org/10.5093/pi2019a18>.
16. Gilissen J, Pivodic L, Wendrich-van Dael A, Cools W, Vander Stichele R, Van den Block L, Deliens L, Gastmans C. Nurses' self-efficacy, rather than their knowledge, is associated with their engagement in advance care planning in nursing homes: A survey study. *J Palliat Med*. 2020;34(7):917-24. Available at: <https://doi.org/10.1177/0269216320916158>.
17. Minayo MC, Almeida LC. Importância da política nacional do idoso no enfrentamento da violência. In: *Política Nacional do idoso: velhas e novas questões*. Ed. Rio de Janeiro: IPEA. 2016: 435-456.
18. Caspari S, Råholm MB, Sæteren B, et al. Tension between freedom and dependence-A challenge for residents who live in nursing homes. *J Clin Nurs*. 2018;27(21-22):4119-4127. Available at: <https://doi.org/10.1111/jocn.14561>
19. Jünger S, Payne SA, Brine J, Radbruch L, Brearley SG. Guidance on Conducting and REporting DELphi Studies (CREDES) in palliative care: Recommendations based on a methodological systematic review. *Palliative medicine*. 2017 Sep;31(8):684-706.
20. Niederberger M, Spranger J. Delphi Technique in Health Sciences: A Map. *Front Public Heal* [Internet]. 2020 Sep 22;8. Available at: <https://www.frontiersin.org/article/10.3389/fpubh.2020.00457/full>
21. Vieira, BL de C. Qualidade do cuidado em instituições de longa permanência para idosos: criação e validação de instrumento de autoavaliação [Tese]. Repositório Institucional da Universidade Federal de Minas Gerais (RI-UFGM). 8 Jul 2022. Available at: <http://hdl.handle.net/1843/47720>.
22. Taylor E. We Agree, Don't We? The Delphi Method for Health Environments Research. *HERD Heal Environ Res Des J* [Internet]. 2020 Jan 30;13(1):11–23. Available at: <http://journals.sagepub.com/doi/10.1177/1937586719887709>
23. Van Loon J, Janssen M, Janssen B, de Rooij I, Luijckx K. How older adults with physical impairments maintain their autonomy in nursing homes. *Ageing Soc* [Internet]. 2023 Jan 25;1–23. Available at: https://www.cambridge.org/core/product/identifier/S0144686X22001428/type/journal_article
24. Gillespie SM, Moser AL, Gokula M, Edmondson T, Rees J, Nelson D, et al. Standards for the Use of Telemedicine for Evaluation and Management of Resident Change of Condition in the Nursing Home. *J Am Med Dir Assoc*. 2019 Feb;20(2):115–22. Available at: <https://doi.org/10.1016/j.jamda.2018.11.022>.
25. Mozaffarian D, Liu J, Sy S, Huang Y, Rehm C, Lee Y, et al. Cost-effectiveness of financial incentives and disincentives for improving food purchases and health through the US Supplemental Nutrition Assistance Program (SNAP): A microsimulation study. *PLOS Med*. 2018 Oct 2;15(10):e1002661. Available at: <https://doi.org/10.1371/journal.pmed.1002661>.
26. Souza PD, Benedetti TR, Borges LJ, Mazo GZ, Gonçalves LH. Functional fitness of elderly living in a long-term care institution. *Revista Brasileira de Geriatria e Gerontologia*. 2011;14:07-16. Available at: <https://doi.org/10.1590/S1809-98232011000100002>

27. Resnick B. Next steps in long term care: How can nursing help?. *Geriatric Nursing* (New York, NY). 2021; 2(4):A1. Available at: <https://doi.org/10.1016/j.gerinurse.2021.06.014>.
28. Aiemyen N, Pothidee T, Sopapornamorn P, Sopapornamorn P, Payukaparp P, Luangnam C, Suksan S et al. Chemical Oral Health care and Aspiration Pneumonia (AP) in Elderly Patients: A Systematic Literature Review. *Journal of International Dental & Medical Research*. 2020; 13(1), 372-378.
29. Husebø AML, Storm M, Våga BB, Rosenberg A, Akerjordet K. Status of knowledge on student-learning environments in nursing homes: A mixed-method systematic review. *J Clin Nurs*. 2018 Apr 30;27(7–8). Available at: <https://doi.org/10.1111/jocn.14299>.
30. Pollo SH, Assis MD. Long-term care facilities—challenges and alternatives in Rio de Janeiro municipality, Brazil. *Revista Brasileira de Geriatria e Gerontologia*. 2019 Aug 5;11:29-44. Available at: <https://doi.org/10.1590/1809-9823.2008.11014>.
31. Roquete FF, Batista CC, Arantes RC. Care and management demands of long-term care facilities for the elderly in Brazil: an integrative review (2004-2014). *Revista Brasileira de Geriatria e Gerontologia*. 2017 Mar;20:286-99. Available at: <https://doi.org/10.1590/1981-22562017020.160053>
32. Schmalz U, Spinler S, Ringbeck J. Lessons learned from a two-round Delphi-based scenario study. *MethodsX*. 2021 Jan 1;8:101179. Available at: <https://doi.org/10.1016/j.mex.2020.101179>
33. Fink-Hafner, D., Dagen, T., Doušák, M., Novak, M., & Hafner-Fink, M. Delphi method: Strengths and weaknesses. *Advances in Methodology and Statistics*. 2019;16(2):1-9. Available at: <https://doi.org/10.51936/fcfm6982>
34. World Health Organization. Decade of healthy ageing. The global strategy and action plan on ageing and health 2016e2020: towards a world in which everyone can live a long and healthy life. [Internet] Seventy-Third World Health Assembly. May 5, 2020. Available at: <https://cdn.who.int/media/docs/default-source/decade-of-healthy-ageing/decade-proposal-final-apr2020-en.pdf> [Internet]
35. Perracini M R, Arias-Casais N, Thiyagarajan J A, et al. A recommended package of long-term care services to promote healthy ageing based on a WHO global expert consensus study. *J Am Med Dir Assoc*. 2022; 23(2): 297-303. Available at: <https://doi.org/10.1016/j.jamda.2021.12.019>.



The care of older adults in the process of frailty: challenges and emotions from the caregiver's perspective

Gislaine Alves de Souza^{1,2} 
Karla Cristina Giacomini^{1,2} 
Josélia Oliveira Araújo Firmo¹ 

Abstract

Objective: To comprehend the challenges and emotions within the caregiving process from the perspective of those who care for older adults in situations of frailty within their own homes. **Method:** A qualitative research approach rooted in the theoretical and methodological framework of Interpretative and Medical Anthropology was employed. Nine female caregivers and one male caregiver were interviewed within the homes of the elderly individuals they were caring for. Emic analysis was guided by the model of Signs, Meanings, and Actions. **Results:** Challenges manifest in the absence of caregiver training, constraints related to hygiene routines, the absence of compliance with labor rights, lack of accessibility and material resources, family relationships, and the interpretation of the actions of the care recipients as stubbornness. Emotions described by the interviewees include affection, satisfaction, fatigue, stress, burden, and fear of worsening and making mistakes. **Conclusion:** Caregivers revealed a deep and complex moral, ethical, and emotional involvement in their caregiving roles. They highlight a scenario where it is essential to recognize and acknowledge the work involved in caring for older adults in situations of frailty and to implement caregiving policies with community and cross-sector support actions.

Keywords: Anthropology. Caregivers. Frail older individual.

¹ Núcleo de Estudos em Saúde Pública e Envelhecimento (NESPE), Instituto René Rachou - Fundação Oswaldo Cruz (FIOCRUZ Minas). Belo Horizonte, MG, Brasil.

² Prefeitura de Belo Horizonte - MG. Secretaria Municipal de Saúde. Belo Horizonte, MG, Brasil.

Research funding: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), 001; Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Process number: 303372/2014-1, Bolsa de produtividade; Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG), Process number: APQ-00703-17.

The authors declare that there is no conflict in the conception of this work.

Correspondence
Gislaine Alves de Souza
gislaine.as@gmail.com

Received: March 13, 2023
Approved: September 25, 2023

INTRODUCTION

The increase in longevity, when coupled with the multifactorial syndrome of frailty^{1,2}, results in a greater demand for care³⁻⁸. The process of frailty is dynamic, encompassing individual, familial, and social factors, and requires an expansion of access to long-term care and informal and formal care networks⁹. It is well-known that caregivers play an essential role in empowering and caring for frail older adults^{1,10}. However, the aging population is occurring with an insufficient number of individuals engaged in caregiving activities, limited support for families, and a lack of preparedness among professionals and services. This is further compounded by the inadequacy of public caregiving policies^{3-7,10,11}.

In Brazil, the majority of caregivers have familial bonds and are over 50 years old^{2,3,5,9}, and when professional assistance is present, it often involves individuals with limited training who work under precarious conditions³. Furthermore, aging with frailty reorients the family dynamic, primarily transforming women into full-time, solitary, and unpaid caregivers^{4,5,10}. Both older adults and those who care for them are affected by individual, social, and programmatic vulnerabilities, leading to a deterioration in living and health conditions^{3,4}. This situation renders them forgotten, undervalued, and invisible^{4,5}. Therefore, there is a need to politicize caregiving on a global scale, moving beyond the distinction between formal and informal caregiving^{11,12}.

Within the field of geriatrics and gerontology, it is considered crucial to comprehend how caregivers experience the intersubjective relationship with caregiving⁵⁻¹⁰, particularly within the context of frailty². There is an interest in exploring the universe in which caregiving takes place and the complexity of this activity, in order to identify the strategies¹³ used to generate information that aims to support^{10,14} caregivers and inform public policies⁵. This is done with the backing of healthcare services^{4,8} to enhance the caregiving conditions² for all individuals involved.

Otherwise, Anthropology inspires us to consider the circuits and various threads that weave the fabric of caregiving, encompassing the multiple forms of concrete work, sociocultural meanings, values, and

emotions in its apprehension¹⁰. However, the analysis of caregiving from the perspective of caregivers of frail older adults¹ is seldom explored. Furthermore, androcentric descriptions fail to comprehensively capture the multifaceted nature of caregiving, as society relies on those who provide care while denying them a place and visibility¹⁵. Thus, this paper aims to understand the challenges and emotions in the caregiving process from the perspective of those who care for frail older adults within their homes.

METHOD

This is a qualitative research anchored in the theoretical and methodological framework of Interpretative and Medical Anthropology^{16,17}, which recognizes that it is through cultural patterns that humans find meaning, interpret, and guide their actions¹⁷. It unveils the social order metaphorically embedded in the biological and interprets the cultural process without being myopic to the social and political dimensions of illness, highlighting power dynamics, the relationship between capitalism and society, the struggle for human rights, and social justice¹⁶.

For participant selection, telephone contacts were made with elderly individuals from the baseline database of the FIBRA study in the Belo Horizonte area, Minas Gerais, Brazil¹⁸. Heterogeneity within the municipality's territory was sought. Interview appointments were made based on convenience. Individuals who agreed to participate in the research were included. Interviews were conducted at the homes of the care recipients, and their preferences to schedule the interviews in accordance with their caregiving routines were accommodated. Data collection occurred in two phases: from January to August 2016 with individuals identified as frail in the database, but due to difficulties in locating surviving individuals or changes in the provided phone numbers, data collection continued from January to May 2018 with individuals identified as pre-frail in the database. There were no refusals to participate. To access perceptions of caregiving in the frailty process, interviews were conducted using a semi-structured script, aiming to understand perceptions of health condition, aging, frailty, caregiving, the strategies employed (community and personal resources), the

difficulties faced in daily life, how they resolve or mitigate them, as well as inquiring about the existence of support from other individuals or institutions and exploring actions they undertake outside the caregiving sphere. The interviews were conducted by psychology and physiotherapy professionals specialized in human aging, lasting an average of 42 minutes. They were recorded and transcribed. The termination of the interviews was based on the quality, quantity, and intensity of the collected data, allowing for the elucidation of the complexity of the phenomenon and facilitating immersion in the sociocultural universe¹⁹.

Data analysis was grounded in the "signs, meanings, and actions" model, starting from actions to access the semantic level as a privileged pathway to cultural systems²⁰. An emic perspective¹⁷ was employed. The analysis commenced with an in-depth reading of the collected material, involving successive readings to identify levels of signs, meanings, and actions related to the theme. Consequently, the content of each interview was segmented and organized, allowing access to interpretations, examination of relationships between the levels, and in-depth analysis, which was compiled into analytical categories.

This research is part of the project "Frailty in Older Adults: perceptions, cultural mediation, coping, and care," approved by the Ethics Committee of the René Rachou Institute - Fiocruz, under opinion number 2141038/15. Prior to the commencement of interviews, participants signed the informed

consent form. Throughout the entire research, the guidelines of Resolutions number 466/2012 and number 510/2016 of the National Health Council were followed. To ensure confidentiality, caregivers were identified by the letter "C" followed by the interviewee's identification number.

DATA AVAILABILITY

The entire dataset that supports the findings of this study is available upon request to the corresponding author, Gislaïne Alves de Souza.

RESULTS

Nine female caregivers and one male caregiver were interviewed, as categorized in Table 1. Seven of the caregivers were single, and three were married (two were spouses, and one was a daughter). The presence of older adults engaged in caregiving activities was noted. Regarding support in caregiving, one family member mentioned daily rotation among children. The other family caregivers reported being responsible for the comprehensive daily management of care, with only occasional support from others. The professional caregivers described this family support in a heterogeneous manner: one family was actively involved, another was passive, and the third had no involvement, but they reported receiving support from other professionals.

Table 1. Characterization of the Interviewed Individuals in the Municipality of Belo Horizonte, MG, 2018.

Caregiver	Sex	Age	Relationship	Description	Condition of the Care Recipient
C1	Fem.	49	Family**	Daughter	Diabetes.
C2	Fem.	24	Professional*	Grandniece	Three falls, fractures, and Parkinson's disease.
C3	Fem.	71	Family**	Daughter	Depression and bronchiectasis.
C4	Fem.	36	Professional*	Caregiver	Nine years on dialysis, eleven surgeries, and femur fracture.
C5	Fem.	65	Family**	Daughter	Alzheimer's disease.
C6	Fem.	33	Professional*	Caregiver	Alzheimer's disease.
C7	Mal.	92	Family**	Husband	Head buzzing, weak leg, and nerve issues.
C8	Fem.	68	Family**	Daughter	Shoulder fracture, back pain, hypertension, and high cholesterol.
C9	Fem.	53	Family**	Daughter	Alzheimer's disease.
C10	Fem.	86	Family**	Wife	Alzheimer's disease.

*Professional = reported receiving payment for caregiving activities, recognized in the literature^{9,12} as a formal caregiver. **Family caregivers are commonly referred to in the literature^{9,12} as informal caregivers.

In the interviews, it was reported that all caregivers had been involved in caregiving for over a decade, except for the youngest caregiver. Various circumstances determined their engagement in this activity, including the worsening of the care recipient's health condition, other family members being employed, unemployment, inability to afford professional caregiving services, and cohabitation with the care recipient. Four caregivers had previous caregiving experiences. All of them resided with the care recipient, except for one professional caregiver.

In the studied scenario, it is observed that caregiving is provided to older adults with varying health conditions, and when asked about frailty, they contextualized it as follows:

"She (my mother) is becoming more fragile; it's a path we have to be more careful on, always watching, whether she wants to do things or not. She is more fragile. (...) I keep an eye on her, watching her all the time. (...) She needs a person like us to take care of her." (C1)

"I believe that (frailty) is the combination of several things (...) because they used to have an active life, had independence from others, but when they have to depend on someone else due to physical or psychological limitations to perform their daily activities, it makes them very fragile. Sometimes they become depressed because they don't feel useful anymore, you know, because they don't have that physical strength (...) their bones are not as strong as they used to be to support their body. So, it's this kind of physical and psychological frailty (...) there are various types of frailties, various aspects of care that you have to work on." (C2)

"Fragile elder? With the fragilities of life? (...) Oh, if they don't have perfect health, if they don't have family support, or if they don't have the financial means to help themselves, or if they don't have the spiritual support to keep them going (...) they can have these physical and mental fragilities (...) she (my mother) had certain fragilities, but she overcame many things. Life wasn't easy for her, especially after my father passed away, so financial fragility is one of the fragilities (...) she didn't give up, she didn't lose heart (...) Aunt M. was a winner; she buried many people and is still alive today, with all she has been through (...) so, one type of frailty is strength (laughs)." (C3)

It is evident that the perception of the frailty process occurs when, due to health conditions, a person needs the care of others to assist in performing basic activities and mobility, as well as the loss of previous independence, decreased energy, and the will to live. The daily caregiving is elucidated, respectively, in the narratives of a family caregiver and a professional caregiver, as seen below:

"Well, I have it all here. A bath? She is dependent. Medication times, lunch, I always have to be there (...) make it clear to her that she has me as a companion. (...) To be honest, I live for her (...) 24 hours in here." (C5)

"She is completely dependent now. I'm the one who gives her baths, I'm the one who administers medication, as she can't see well, I help her with her meals (...) I put her in the wheelchair, and I take her to the doctor. (...) I spend 12 hours with her every day, I just don't stay overnight." (C6)

For an understanding of caregiving relationships, the analysis revealed two categories: "Challenges" and "Emotions."

Challenges

The majority reported challenges in caregiving that impact daily life:

"The time when we had a caregiver, unfortunately, we couldn't afford it, it's not cheap (...) I told them, there will come a point when it will fall on all of us: giving a bath, helping in the bathroom, changing a diaper. 'Oh, but we are men' (referring to the arguments of the children). So what? You are still children (...) The neurologist said, you need someone who can be more assertive with her: 'No means no.' So, when I say 'no,' she says, 'you are angry, you are angry with me'... (gets emotional) (...) Many times, if I go out nearby, there's someone else with her, but she immediately asks me: 'Why did you leave?'" (C5)

"I think the most interfering factor is that there's no room for error, you know!? Because it's a person, it's a life that depends on you (...) mobility is a challenge (...) I arrived at Hospital X, and there was no wheelchair there! (...) It's a hassle, a lack of commitment (...) I carry her in my arms." (C2)

"I had to be with my mom practically 24/7 (...) Someone said, 'Wow! A 71-year-old woman taking care of a 90-year-old person! They are both elderly!' (...) I wanted to sleep at night, but she was awake (laughs) (...) one day, the house collapses, the chubby one falls (referring to herself) (laughs) gets fat because she's very anxious, gains over twenty kilos, but one day, it breaks down!" (C3)

Being unable to afford care, needing to set boundaries, being unable to leave, needing to fight for proper treatment, falling ill, having to cope with the emotional impact of the care recipient, and dealing with the relationship with other family members are some of the challenges that require attention. A summary of the enumerated challenges is presented in Table 2.

Table 2. Summary of the challenges in caregiving from the perspective of those caring for frail older adults. Belo Horizonte, MG, 2018.

Compiled List of Challenges
<p>Structural</p> <ul style="list-style-type: none"> • Limited financial resources (C3, C4, C5); • Lack of accessibility (stairs) (C2, C6); • Limited access to potential prognoses (communication failures by healthcare professionals) (C3); • Need to fight for the elderly person to receive dignified treatment (C2, C3); • Gender stereotypes (C3, C5); • "Stubbornness" of the care recipient (ageism) (C1, C4, C8);
<p>Sociofamilial</p> <ul style="list-style-type: none"> • Inability to care for the elderly person alone (C2, C3, C4, C5, C7); • Limited involvement of other family members in caregiving (C3, C4); • Changes in family relationships (C3, C8);
<p>Adaptations</p> <ul style="list-style-type: none"> • Need for environmental adaptations for mobility and safety (C2, C4); • Need for support in performing transfers (C2, C5, C6);
<p>Neglect of Self-Care</p> <ul style="list-style-type: none"> • Limited time for oneself and for sleep (C3, C4, C5); • Impact on one's own health (C3, C5); • Postponement of personal projects (C1, C4, C5); • Impact of the care recipient's emotions (C2, C3, C4, C5);
<p>Distrust</p> <ul style="list-style-type: none"> • Embarrassment with exposing the body during hygiene activities (C4, C5); • The care recipient lacks trust in another caregiver (C3, C4, C5);
<p>Lack of Professionalism</p> <ul style="list-style-type: none"> • Lack of training (C2); • Failures in complying with labor rights (C4, C6).

Emotions

In the face of these challenges, different emotions are expressed in the narratives of everyday actions that are seen as caregiving and are manifested throughout the interviews:

"Dad was diagnosed (with Alzheimer's) in 2008 (...) there was a phase of paranoia, it was very difficult. (...) It's a loving and physical contact

that I didn't have with him, and now I can have it." (C9)

"Oh, it weighs heavily (...) The fear, not of today, but usually I'm already thinking about tomorrow!? How will she wake up tomorrow? (...) Will I be able to handle it?" (C5)

"I think we have already formed a father-son bond (...) When Mr. A. is unwell, I feel like I'm unwell too (...) I've spent three months here without going

to my own home because of him (...) his daughters say that if I leave, he will die (...) There was a time when I was at hemodialysis with Mr. A., and my brother had a heart attack and passed away (...) so I had to wait, I couldn't show it to Mr. A." (C4)

A summary of the emotions is presented in Table 3.

Figure 1 outlines the main findings of this paper.

Table 3. Summary of Emotions Triggered in the Caregiving Relationship from the Perspective of Those Caring for Frail Older Adults. Belo Horizonte, MG, 2018.

Compiled List of Emotions
<p>Emotions that Favor Care</p> <ul style="list-style-type: none"> • Affection, care, and satisfaction (C2, C3, C4, C6, C8, C9); • Gratitude (C1, C8, C10); • Patience, compassion (C2, C3, C4, C6);
<p>Emotions that Sustain Care, but Intensity Hinders</p> <ul style="list-style-type: none"> • Excessive closeness; emotional dependence, symbiosis (C3, C4, C5); • Being affected by the joys and sorrows of the care recipient (C2, C3, C4, C5); • Feeling responsible for the life of the care recipient (C1, C3, C4, C5, C6);
<p>Emotions that Burden Care</p> <ul style="list-style-type: none"> • Fear of the care recipient's death or what might happen (C2, C4, C5); • Fear of making a mistake (C2, C5); • Being frightened by behavioral changes or deteriorations in the care recipient's condition (C5, C10); • Insecurity, anguish (C1, C2, C3, C4, C5); • Helplessness, anger, and impatience (C5); • Fatigue, anxiety, isolation, and stress (C3, C4, C5).

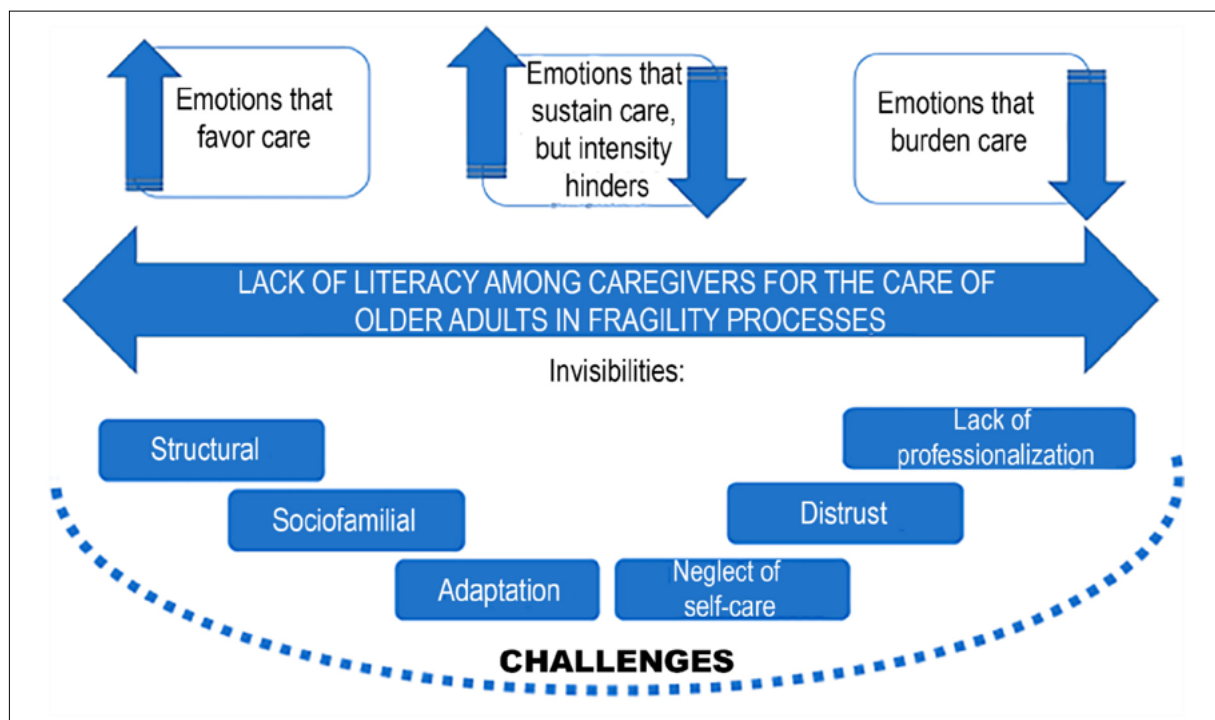


Figure 1. Challenges and emotions in the care process for those caring for older adults in a state of fragility. Belo Horizonte, MG, 2018.

DISCUSSION

In this research, frailty is recognized by the caregivers in various ways: physical, mental, emotional, cognitive, familial/absence of a companion, financial, communicational, and spiritual. The individuals interviewed contribute to the understanding that those who provide care also feel frail when they find themselves unable to meet all the needs of the care recipient. Additionally, this perception of frailty does not exclude "fortility": the strength to sustain life and the caregiving process. However, in the researched literature, no studies were found that explore the process of frailty from the perspective of the caregiver.

In the literature, frailty is characterized as a complex, polysemic, multidimensional, and multicausal concept, influenced by biological, psychological, social and environmental factors²¹. Although there is no unanimity in the definition of frailty, it is generally associated with an increased likelihood of unfavorable clinical conditions, such as susceptibility to diseases, functional decline, dependence in activities of daily living, falls, hospitalization, and early death²¹. It also encompasses issues that go beyond the individual, including the environment and macro aspects that influence the quality of life²², pointing to social, subjective, political, and cultural causes.

Throughout the interviews, there were initially difficulties in naming the limitations of the care recipient, which were overcome after the establishment of a receptive listening space. Similarly, a study reports the initial denial of the caregiving burden, although the presence of physical, psychological, and financial burdens was evident²³. In this research, it was also observed in the field that the interviewed group was concerned with demonstrating that they provide care in the best possible way.

During the interviews, they expressed challenges related to mobility and the need for assistance in taking care recipients to medical appointments, as well as barriers to accessibility, which have also been recognized in other studies²³. Additionally, the caregiving responsibility redefines the existential project of the caregivers, affecting their personal,

family, and professional projects⁷. This leads to physical and emotional exhaustion^{2,4,8}, fatigue, burden, burnout, and a loss of freedom⁴. The caregivers stated that they were unable to sustain the necessary care alone, bearing an overwhelming responsibility for the life of the care recipient. Often, care is provided without social support and without recognition of the work being performed. The literature highlights the decreasing provision of care by the family and their inability to fulfill more than 50% of the care needs of dependent elderly individuals⁸. There is significant pressure on family caregivers, a lack of Public support²³, and a demand for the regulation of these professionals⁶.

The difficulty of involving other family members in caregiving, especially men, highlights gender-related issues and challenges the traditional notion that caregiving is exclusively a female task. The literature has devoted significant effort to this discussion¹², recognizing that women still predominantly perform caregiving activities and that this role remains largely invisible^{4,5,13,23,24}. Unpaid domestic labor continues to be associated with women^{25,26}.

Another reflection of how society perceives old age is the interpretation of certain behaviors exhibited by the person being cared for, which can complicate the caregiving process. Expressions like "old people's quirks," "stubbornness," or "refusing to leave home" appear in the narratives of caregivers, whether they are professionals or family members. These interpretations reveal ageism, where stereotypes about old age are normalized and turned into an individual problem²⁷. The ethics of caregiving present a challenge due to the power dynamics involved in continuous surveillance and the disciplining of actions¹¹.

In the field, a wide range of caregiving relationships and resources are observed, including diverse family and community bonds, varying health conditions, the worsening and manifestation of behavioral symptoms. The constant efforts to access services and secure effective access to resources, including healthcare, conflict with physical inaccessibility, restrictions in accessing treatment, support, and education, as well as the vulnerability of the social condition. These aspects frequently present themselves as challenges

in the caregiving process, and they align with the findings in the existing literature^{7,14}.

Furthermore, when caregiving is prolonged, intrafamily conflicts can arise⁸, and often the willingness to care is sustained at the expense of neglecting one's own Self-care⁸. The sense of lacking support from other family members is identified in this study and in various other researches^{13,23}.

All the interviewees mentioned experiencing impacts on their physical, mental, and emotional health. In line with other research, they faced repetitive, increasing, and varied demands; exhausting schedules with unrestricted dedication. One caregiver mentioned "breaking down," revealing that providing care has psychiatric and somatic consequences^{23,28,29}, as well as repercussions on their overall health. Prolonged caregiving can cause overload¹³, and self-care is reported as being challenging, although it is essential to continue providing care¹⁴.

Family and professional caregivers are willing to sacrifice their well-being to provide care^{7,23} and they have health disadvantages compared to non-caregivers⁷. They experience different degrees of burden across various domains⁷ and scopes^{5,23} (physical, emotional, social, mental, and financial) and have difficulties in preparing to provide care. Additionally, they report that the repetitive behavior, messiness, and aggressiveness²⁸ of the care recipient can be tiring.

The interviewees mentioned that care recipients felt uncomfortable with other individuals assisting them in hygiene routines, which can lead to awkward situations^{14,29}. Having to sleep in the hospital or being the one to provide care became evident in the interview when the care recipient does not accept support from others.

With the exception of one professional who works 12 hours a day and a family member who, with social and economic resources, readjusted their life to maintain care, all other caregivers faced challenges in balancing the caregiving task with other aspects of their lives. All the interviewed professionals mentioned exceeding the eight-hour daily work limit. This overload and the precariousness of employment relationships are observed in other studies⁶.

Therefore, the results highlight that care should not remain hidden and needs support since one of the difficulties experienced is the reversal of roles when it is necessary to exert authority over parental figures or when the care recipient suffers due to the care received. Both forms of suffering have specificities within the field of geriatrics and gerontology.

The interviewed individuals described experiencing contradictory feelings and emotions^{2,5,6,9,24} in the context of care. Caring is redefined as an act of love; an opportunity for closeness and emotional connection; a circumstance to understand oneself as a person with virtues, investing daily to preserve someone's life. In the literature, caring for a family member who has lost autonomy reflects feelings such as gratitude, reciprocity, generosity, justice, dedication, ethical and moral responsibility^{4,5}.

Two professional caregivers mentioned assuming the caregiving role "as a family member." Soares²⁹ discusses that care is considered to be done better when the dedication is similar to that of a family member. This is a relationship in which involvement and love are present, inevitable, essential, and positive, although they are often disregarded and invisible³⁰. While caregiving involves a moral code of self-sacrifice that binds the caregiver to the care recipient⁶, sociocultural values attributed to caregiving by today's society³⁰ expect a balance in the expression of emotions by caregivers. However, the entire group experienced changes in their lives due to the caregiving role and the emotional involvement, leading to complete dedication. The interviewees stated that they forget about themselves, and even symbiotic relationships, where there is mutual dependency⁶, were demonstrated, dedicated to caregiving.

Empathy with the other's pain, sadness in witnessing someone lose a function they used to perform, as well as joy in regaining mobility, were described by the caregivers. This responsibility for someone else's life is part of the ethics of care¹² that requires reflection and goes beyond mere prescriptions²⁹. In this face-to-face work, the emotional expression of the individuals involved²⁹ affects the dynamics of care, and a significant amount of emotional work is done^{14,24,29}. Caregivers

make efforts to ensure that the care recipient emotionally recognizes them as companions. The literature discusses that this compassionate love allows for the well-being of the elderly person, creating a beneficial emotional connection for those involved³¹ and for society^{31,32}.

Nevertheless, other emotions permeate the statements of the interviewed individuals: dealing with the fear of failing in providing care⁵, of not being able to handle the care, and recognizing that the relationship dictated by caregiving is complex and tiring. Caregivers acknowledge the challenges of dealing with self-judgment and the judgment of others⁵, with irritability, and with feelings of loss and helplessness due to the worsening of the care recipient's condition⁸.

It is expected that knowledge about the care recipient's health issue, the longer duration of the relationship⁴, a positive relationship²⁸, and the establishment of a trusting bond²⁹ would provide more security in performing the caregiving role and reduce emotional labor. Conversely, in this research, the fluctuation or worsening of the care recipient's condition and the increasing complexity of demands destabilize this sense of security and require more emotional labor. There is a lack of information when facing new challenges²; there is doubt about whether the care being provided is correct, sufficient, in line with prescriptions, or suitable for the well-being of the older adult. In addition, there is a lack of support, guidance, and care support actions in Brazil⁶⁻⁸. Ultimately, the study highlights the lack of literacy in caring for an older adult in a state of frailty.

Limitations of this research include the fact that it was conducted only with caregivers of participants from the baseline of the FIBRA study, which may have restricted its scope but provided insights into the experience of caring for older adults in a state of frailty. The choice to explore the caregiving universe where it takes place allowed for listening to the voices of both professional and family caregivers, considering their collisions and specificities. This presents a challenge in finding similar literature, but it also introduces the novelty of this research. The understanding that all care is labor³³ underpins

this construction, aiming to shed light on tacit knowledge that is culturally embedded and marked by sociopolitical factors that naturalize and render it invisible. It is considered that the issue of caregiving as employment is one that requires further regulation in the country.

CONCLUSION

In this research, among those who care for older adults in a state of frailty, caregiving is intense, forming a relationship that involves presence and dedication across multiple dimensions. It is a complex endeavor, as it requires various forms of support to assist someone experiencing the loss of their previous independence.

Caregivers revealed a moral commitment ("the person being cared for depends on me"), but also an ethical (of humanity, dedication) and emotional commitment (of interest, affection, and reciprocity), contributing valuable insights to the field of geriatrics and gerontology. Caregiving for caregivers is a subtle and complex relationship, filled with emotions and challenges. The lack of training for caregiving, as well as the lack of accessibility and material resources, is experienced by both family and professional caregivers. Thus, there is a need for public policies to alleviate these difficulties. In the same perspective, the absence of compliance with labor rights is striking for professional caregivers, while the invisibility of caregiving within the home setting as a form of work is notable for family caregivers. For all caregivers, it is evident that support is needed to continue caregiving without neglecting self-care.

Caring for older adults in a state of frailty is an essential task sustained by creations and coping. This implies understanding older adults in a state of frailty and those who care for them as individuals whose humanity and subjectivity must be recognized and respected. For this purpose, the presence and support of the social and family network are necessary, as well as the investment in public policies that offer community and intersectoral care actions, with the participation of all involved: the older adult, the caregiver, the family, society, and the state.

AUTHORSHIP

- Gislaine A. Souza participated in the conception, design, data analysis, and interpretation; paper writing; approval of the version to be published and is responsible for all aspects of the work ensuring issues related to the integrity of any part of the work.
- Karla C. Giacomini participated in the conception, design, and data interpretation; paper writing and critical review; approval of the version to

be published and is responsible for all aspects of the work ensuring issues related to the integrity of any part of the work.

- Josélia O. A. Firmo participated in the conception and design of the data; critical review of the paper; approval of the version to be published and is responsible for all aspects of the work ensuring issues related to the integrity of any part of the work.

Edited by: Maria Helena Rodrigues Galvão






REFERENCES

1. Nan J, Duan Y, Wu S, Liao L, Li X, Zhao Y et al. Perspectives of older adults, caregivers, healthcare providers on frailty screening in primary care: a systematic review and qualitative meta-synthesis. *BMC Geriatrics*. 2022;22(482).
2. Lacerda MA, Silva LLT, Oliveira F, Coelho KR. O cuidado com o idoso fragilizado e a Estratégia Saúde da Família: perspectivas do cuidador informal familiar. *Rev baiana enferm*. 2021;35:e43127.
3. Ceccon RF, Vieira LJES, Brasil CCP, Soares KG, Portes VM, Garcia Júnior CAS et al. Envelhecimento e dependência no Brasil: características sociodemográficas e assistenciais de idosos e cuidadores. *Ciênc. Saúde Colet*. 2021;26(1):17-26.
4. Sousa GS, Silva RM, Reinaldo MAS, Soares SM, Gutierrez DMD, Figueiredo MLF. “A gente não é de ferro”: Vivências de cuidadores familiares sobre o cuidado com idosos dependentes no Brasil. *Ciênc. Saúde Colet*. 2021;26(1):27-36.
5. Gutierrez DMD, Sousa GS, Figueiredo AEB, Ribeiro MNS, Diniz CX, Nobre GASS. Vivências subjetivas de familiares que cuidam de idosos dependentes. *Ciênc. Saúde Colet*. 2021;26(1):47-56.
6. Figueiredo MLF, Gutierrez DMD, Darder JJT, Silva RF, Carvalho ML. Cuidadores formais de idosos dependentes no domicílio: desafios vivenciados. *Ciênc. Saúde Colet*. 2021;26(1):37-46.
7. Diniz MAA, Melo BRS, Neri KH, Casemiro FG, Figueiredo LC, Gaioli CCLO et al. Estudo comparativo entre cuidadores formais e informais de idosos. *Ciênc. saúde colet*. 2018;23(11):3789-3798.
8. Santos SMA, Rifiotis T. Cuidadores familiares de idosos dementados: um estudo crítico de práticas quotidianas e políticas sociais de judicialização e reprivatização. In: Grossi MP, Schwabe E, organizadores. *Política e cotidiano: estudos antropológicos sobre gênero, família e sexualidade*. Blumenau: Nova Letras, Associação Brasileira de Antropologia, 2006. p.95-114.
9. Basu R, Steiner AC, Stevens AB. Long-Term Care Market Trend and Patterns of Caregiving in the U.S. *Journal of Aging & Social Policy*. 2022;34(1):20-37.
10. Kleinman A. Varieties of Experiences of Care. *Perspectives in Biology and Medicine*. 2020;63(3):458–465.
11. Debert GG, Pulhez MM, organizadoras. *Desafios do cuidado, gênero, velhice e deficiência*. 2ª ed. Campinas: Unicamp/IFCH, 2019.
12. Tronto J. *Caring democracy: Markets, equality, and justice*. New York: New York University Press, 2013.
13. Nespolo G, Merhy EE. Trabalho em saúde: biomedicalização de quem cuida. *Saúde em Rede*. 2018;4(2):9-18.
14. Wiles J, Moeke-Maxwell T, Williams L, Black S, Trussardi G, Gott M. Caregivers for people at end of life in advanced age: knowing, doing and negotiating care. *Age Ageing*. 2018;47(6):887-895.
15. Molinier P. Ética e trabalho do care. In: Hirata H, Guimarães NA, organizadores. *Cuidado e cuidadoras: as várias faces do trabalho do care*. São Paulo: editora Atlas, 2012, p.29-43.

16. Nunes MO. Da aplicação à implicação na Antropologia médica: leituras políticas, históricas e narrativas do mundo do adoecimento e da saúde. *Análise Hist. cienc. saude-Manguinhos*. 2014;21(2).
17. Geertz C. *A Interpretação das Culturas*. Rio de Janeiro: Editora Guanabara Koogan, LTC, Antropologia Social, 1989.
18. Vieira RA, Guerra RO, Giacomini KC, Vasconcelos KSS, Andrade ACS, Pereira LSM et al. Prevalência de fragilidade e fatores associados em idosos comunitários de Belo Horizonte, Minas Gerais, Brasil: dados do estudo FIBRA. *Cadernos de Saúde Pública*. 2013;(29):1631-1643.
19. Minayo MCS. Amostragem e saturação em pesquisa qualitativa: consensos e controvérsias. *Revista Pesquisa Qualitativa*. 2017;5(7):1-12.
20. Corin E, Uchôa E, Bibeau G. Articulation et variations des systèmes de signes, de sens et d'action. *Psychopathologie africaine*. 1992;24(2):183-204.
21. Kim Y, Jang S. Mapping the knowledge structure of frailty in journal articles by text network analysis. *PloS one*. 2018;13(4):e0196104.
22. Dury S, Dierckx E, Vorst A, Elst M, Fret B, Duppen D, et al. Detecting frail, older adults and identifying their strengths: results of a mixed-methods study. *BMC Public Health*. 2018;18(1):191.
23. Faronbi JO, Faronbi GO, Ayamolowo SJ, Olagun AA. Caring for the seniors with chronic illness: The lived experience of caregivers of older adults. *Archives of Gerontology and Geriatrics*. 2019;82:8-14.
24. Araújo AB. Cuidado de idosos e emoções na pandemia. In: Angotti B, Vieira RSC, organizadores. *Cuidar, verbo coletivo: diálogos sobre o cuidado na pandemia da Covid-19*. Joaçaba: Editora Unoesc, 2021, p.235-244.
25. Avila MB, Ferreira V. Trabalho doméstico remunerado: contradições estruturantes e emergentes nas relações sociais no Brasil. *Psicol. Soc.* 2020;32.
26. Hirata H. Cuidado: teorias e práticas. In: Angotti B, Vieira RSC, organizadores. *Cuidar, verbo coletivo: diálogos sobre o cuidado na pandemia da Covid-19*. Joaçaba: Editora Unoesc, 2021, p.31-40.
27. Debert GG. O velho na propaganda. *Cad. Pagu*. 2003;(21).
28. Bjorge H, Kvall K, Ulstein I. The effect of psychosocial support on caregivers' perceived criticism and emotional over-involvement of persons with dementia: an assessor-blinded randomized controlled trial. *BMC Health Serv Res*. 2019;9(1):744.
29. Soares A. O trabalho de cuidar e as emoções nos tempos da Covid-19. In: Angotti B, Vieira RSC, organizadores. *Cuidar, verbo coletivo: diálogos sobre o cuidado na pandemia da Covid-19*. Joaçaba: Editora Unoesc, 2021, p.41-56.
30. Le Breton D. *As Paixões Ordinárias: Antropologia das Emoções*. Tradução: Peretti, L.A.S. Rio de Janeiro: Vozes, 2009. 276p.
31. Kahana E, Bhatta TR, Kahana B, Likhak N. Loving Others: The Impact of Compassionate Love on Later-Life Psychological Well-being. *The Journals of Gerontology: Series B*. 2021;76(2):391-402.
32. Horden J. The Dignity of the Frail: On Compassion, Terror, and Social Death. *Literature and Medicine*, Johns Hopkins University Press. 2020;38(2):349-370.
33. Antunes R. Adeus ao trabalho? ensaio sobre as metamorfoses e a centralidade no mundo do trabalho. São Paulo: Cortez, 2021.



Intergenerationality and Health Promotion: Reflections and Challenges in the Care of Older Adults

Ana Paula Ribeiro de Castro¹ 
Antonio Germane Alves Pinto² 
José Maria Ximenes Guimarães³ 
Geanne Maria Costa Torres⁴ 
Ana Patrícia Pereira Morais⁵ 

Abstract

Objective: To discuss the promotion of health for older adults through intergenerationality, with an emphasis on intergenerational education within Intergenerational Programs, as a proposal for education fostering the protagonism of older adults and successful aging. **Method:** Theoretical essay, reflective in nature with a qualitative approach. Grounded in the examination of documents emphasizing the increase in longevity and the concern for health promotion among older adults in Brazil, the aim is to contemplate intergenerationality in health promotion and the utilization of intergenerational education to foster successful aging through Intergenerational Programs. **Results:** Organized into three topics: Health promotion for older adults: challenges for their protagonism; Understanding aging for intergenerational learning; Intergenerational program: protagonism for the health promotion of older adults. **Conclusion:** Successful experiences in health, specifically within the realms of Primary Health Care, still appear to be limited or insufficiently recognized for the development of transformative education in health promotion for older adults. The challenge lies in fostering scientific research so that professionals, through continuous education, can enhance health education moments through intergenerational education. Thus, the establishment and implementation of Intergenerational Programs may represent this promising possibility.

Keywords: Aging. Older Adults. Intergenerational Relationships. Health Promotion.

¹ Universidade Estadual do Ceará (UECE), Centro de Ciências da Saúde, Programa de Doutorado Profissional em Saúde da Família. Juazeiro do Norte, CE, Brasil.

² Universidade Regional do Cariri (URCA), Centro de Ciências Biológicas e da Saúde, Programa de Doutorado em Saúde Coletiva. Crato, CE, Brasil.

³ Universidade Estadual do Ceará (UECE), Centro de Ciências da Saúde, Programa de Doutorado em Saúde Coletiva. Fortaleza, CE, Brasil.

⁴ Universidade Estadual do Ceará (UECE), Centro de Ciências da Saúde, Programa de Doutorado Profissional em Saúde da Família. Campos Sales, CE, Brasil.

⁵ Universidade Estadual do Ceará (UECE), Centro de Ciências da Saúde, Programa de Doutorado em Saúde Pública. Fortaleza, CE, Brasil.

There was no funding for the execution of this work

The authors declare that there is no conflict in the conception of this work.

Correspondence
Ana Paula Ribeiro de Castro
anapaulacastrocrato@gmail.com

Received: April 11, 2023
Approved: January 08, 2024

INTRODUCTION

Aging is a sequential, natural, individual, irreversible, universal, cumulative, continuous, and non-pathological process of organic changes, involving progressive loss of functional and cognitive capacities, stemming from human senescence and senility. Understanding this concept is crucial for the older population to be active and reflective of their role in society, possessing rights and responsibilities, actively participating in decision-making processes related to health and illness. In essence, it involves being a true protagonist, empowered to contribute to health promotion¹.

Considering the older adult beyond the biological realm is imperative, despite the prevailing, deeply rooted clinical practice, not only among medical professionals, which may marginalize the older adult from the planning of their care. Learning to think from the perspective of life cycles, without confining it solely to the processes of illness², is a challenge for healthcare professionals and a necessity within the context of Primary Health Care. Recognizing the space for the voice and thoughts of older adults, as well as the potentiality of their oral narratives in constructing knowledge for health promotion, is essential.

Successful aging entails the prevention of harm and diseases through the identification of risk factors; the preservation of functional and cognitive capacities through a multidimensional assessment of the older adult; and the engagement and participation of these individuals in social and community activities. This involvement is crucial for the discussion, development, implementation, and realization of policies and programs that encompass health promotion².

Therefore, within the perspective of the Family Health Strategy (FHS), professionals can provide such care, grounded in the essential attributes of Primary Health Care (PHC), acting as the first point of contact for health issues, promoting integrated, longitudinal, and coordinated actions^{3,4}. These attributes can contribute to the strengthening of intergenerational relationships, expanding the possibilities of support and care that intertwine

across generations, incorporating experiences and affective exchanges. This is facilitated through dialogue, respect, and information that contribute to meeting the needs of older adults.

In this context, intergenerationality can serve as an initiative for the development of strategies, programs, and integrated, humanized health actions, founded on comprehensive care for vulnerable populations. Although being an older adult does not necessarily imply illness, with the advancement of chronological age, vulnerability becomes evident, associated with social, physical, and psychological demands⁵. It is, therefore, necessary to stimulate reflections on intergenerationality in the appreciation of health and successful aging throughout the entire lifespan, considering the power of intergenerational education in developing competencies and spaces for dialogue and communication. This is achieved through the sharing of knowledge, skills, and attitudes that value and transform different generations. Thus, Intergenerational Programs (IPs) can be understood as intentional, planned interactions between different age groups, facilitating the sharing of knowledge, skills, and emotions. Initially implemented through the initiative of the United Nations Educational, Scientific and Cultural Organization (UNESCO), with emphasis in Europe, these programs have evolved into spaces for learning exchanges among different generations. They represent strategies fundamental for enhancing social and health public policies to foster successful aging^{4,6}.

In light of the foregoing, the objective of this theoretical-reflective essay is to discuss the promotion of health for older adults through intergenerationality, placing emphasis on intergenerational education within Intergenerational Programs. This is proposed as an educational approach to foster the protagonism of older adults and facilitate successful aging.

METHOD

This is a theoretical essay with a reflective and qualitative approach. It is grounded in readings of the National Elderly Policy (PNI), National Elderly Health Policy (PNSI), Elderly Person Statute, and National Health Policy for the Elderly (PNSPI),

as well as documents illustrating the increase in longevity, the imperative to ensure social rights, and the promotion of conditions for the active participation of the elderly in society. These policies were strengthened with the restoration of democracy, starting from the Citizen Constitution of 1988 and the establishment of the Unified Health System (SUS). There is a current commitment to strengthening Primary Health Care (PHC) to achieve its guidelines, aiming for comprehensive, universal, and equitable healthcare for older adults.

Subsequently, a search was conducted in national and international databases, including the Medical Literature Analysis and Retrieval System Online (MEDLINE), Latin American and Caribbean Health Sciences Literature (LILACS), the Virtual Health Library (BVS - Biblioteca Virtual da Saúde), and the Periodicals Portal of the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES). The search in these databases was carried out without temporal limitations, using descriptors related to the topic (Aging, Older Adults, Intergenerational Relationships, Health Promotion), interconnected by the Boolean operator AND, from September to December 2021. This was done to provide a foundation for the reflection and discussion on health promotion and successful aging through intergenerationality within the context of Primary Health Care.

The text has been organized into three sections: Health promotion for older adults and the challenges for their protagonism; Understanding aging for intergenerational learning: a strategy for transformative education; Intergenerational program: protagonism for the health promotion of older adults.

Ethical approval by a Research Ethics Committee is not required as this study is of a reflective-theoretical nature, in accordance with the guidelines outlined in Resolution 510/2016⁷.

DATA AVAILABILITY

All the datasets supporting the results of this study have been made available in the references.

Promotion of Health for Older Adults and Challenges for Their Protagonism

The definition of health promotion, upon which this essay is anchored, originates from Ottawa and is understood as "the process of enabling communities to increase control over their health and its determinants, thereby improving their quality of life (...)"^{8,19,20}. Derived from this theoretical framework, it is crucial to comprehend and reflect upon the sought-after protagonism of individuals and the necessity for them to be "empowered". It is imperative that individuals collectively develop the ability and power to act for the benefit of their own quality of life, serving as active, individual, and/or collective agents in shaping health-promoting ideas for the world⁹.

Several reflections arise from this, as how is Brazil progressing to ensure or even provide protagonism for older population and future generations? Do the policies that document the legal-operational framework to operationalize health promotion strategies, with an emphasis on PHC, truly guarantee this protagonism? Or, on the contrary, do they still rely on verticalized programs, without the effective implementation of the health care continuum for older adults, primarily focusing on addressing chronic conditions and issues related to senility?

The political history for the health of older adults begins with the National Elderly Policy (PNI) in 1994, amid the backdrop of the restoration of Brazilian democracy, the Citizen Constitution, the establishment of the SUS and the strengthening of the Family Health Program, with PHC and its principles taking center stage in the territories. Consequently, amidst challenges, aging finally becomes a focal point in Brazil. The theoretical, legal, and methodological foundations for addressing the needs and possibilities of promoting the protagonism of older adults were established in 2006 with the National Elderly Policy (PNPI). This reaffirms the commitment of the management to expand and enhance health promotion actions^{10,11}.

Considering the guidelines of the PNPI in 2006, the protagonism of older adults can be

built throughout the life cycles. This involves understanding that it should not be limited solely to the chronological age of 60 years and older, as stipulated by the Elderly Statute. Notably, item 3.1 emphasizes the importance of valuing and respecting "old age" and the need to stimulate solidarity for this age group¹¹.

The promotion of health, coupled with the concept that the individual should be empowered, encourages thinking about active participation in decisions regarding one's health and territory. However, the reflection on this concept revolves around how we are allowing older adults to empower themselves. The "empowered individual" comes into existence through community participation and involvement in the planning and execution of health actions.

In this context, it is essential for older adults to be this "empowered individual," actively participating in society for health promotion, strengthened by the collective efforts that involve multiple generations. To achieve this, the voices and thoughts of older adults, who are aware of their place in society, must resonate in intersectoral actions, social control, and other forums discussing the health/illness process and social determinants related to population aging.

Hence, there is a clear need to include older adults in the discussion process regarding the implementation of policies that promote health. Recognizing the potential of this group for active participation in society and their ability to transform their own reality are crucial premises for the development of effective policies aimed at promoting the health of these individuals¹².

Reiterating the reflection, perceiving individuals aged 60 and older solely as carriers of chronic diseases and incapacitated by senility may overshadow actions aimed at curative and health recovery, as well as promotion and prevention. The imagery surrounding older adults, coupled with the perception of dependence on multi and interprofessional care, can lead to attitudes that emphasize medicalization and other measures strictly focused on the process of illness. It is imperative to advocate for the voice and thoughts of older adults in health promotion¹.

The challenges for the protagonism of older adults in consolidating successful health promotion strategies still lie in the gap within the care processes for these individuals. Despite successful experiences within the FHS, a disease-centered perspective appears to persist. Care focused on outpatient appointments based on "free demand," home visits restricted to the treatment of chronic diseases, and consultations for the monitoring of hypertension and diabetes, reinforced by the funding structure of Brazilian PHC, solidify curative practices¹².

Actions, strategies, and programs that promote health for successful aging are indeed necessary, but above all, they must be led by the voices, thoughts, and ideas of the older adults served in the vibrant territory of PHC. This can occur in education and health groups, in conversational circles, in waiting rooms, and in various community spaces.

The protagonism of older adults will be achievable when professionals allow the occupation of thought and voice within the spaces for health promotion. Therefore, there is an urgent need to comprehend older adults, working on competencies and skills, putting them into practice, and creating spaces that enable their proactive and protagonistic involvement, allowing them to assume a voice to enhance themselves personally and socially.

Understanding Aging for Intergenerational Learning: A Strategy for Transformative Education

Aging is grounded in a concept that extends beyond the mere definition, as the authors have previously elucidated in this essay. From this perspective, it becomes essential to reflect on the discourse of active aging proposed by the World Health Organization and the European Union. These entities advocate that maintaining physical activity, adopting a healthy diet, among other individual behaviors, leads to increased longevity and the preservation of health¹³.

Nevertheless, the change must be collective, not stemming solely from individual responsibility. Thus, it is opportune to reflect on the responsibility for

achieving successful aging, as it involves preventing harm, early diagnosis of chronic conditions that may affect functionality and cognition, and maintaining an active presence in social and community life. The promotion of health for successful aging encompasses the organizational structures of society, the economy, health services, and their respective levels of assistance. It goes beyond an individual's inability to maintain health^{1,13}.

Based on these considerations, the reflection on intergenerational learning requires a critical examination of aging, far from imposing radicalization in thinking that has long been nurtured and has reinforced stigmas against older adults and gaps in formative processes in the health field. This mindset confines health promotion to quality of life, individual reach, and outcomes of efforts without interference from social determinants.

It is essential to consider the protagonism of older adults through intergenerational relationships, employing strategies that strengthen intergenerational solidarity. However, the voices and thoughts of older adults must be acknowledged, heard, and respected for collective empowerment.

In PHC, specifically within the FHS, intergenerational relationships can be addressed through intergenerational education for health promotion. For instance, consider an experience involving a workshop with adolescents on pregnancy prevention using an intergenerational education approach. This initiative led to a roundtable discussion involving parents, grandparents, and adolescents in a municipality in the interior of Ceará, as part of the School Health Program (Programa Saúde na Escola - PSE). This activity aimed to demystify taboos and stimulate reflection on the importance of intergenerational understanding of pregnancy during adolescence. The perspective emphasized affection, dialogue, and trust between generations for intergenerational relationships and health prevention¹⁴.

The significance of this experience lies in the fact that the intergenerational theme is not part of the content of the PSE. Nevertheless, the authors mentioned above considered that it could be worked on in a cross-cutting and interdisciplinary manner.

This strategy can bring benefits to the understanding of topics that require dialogue between generations, recognizing the importance of older adults for families and consolidating intergenerational solidarity.

Intergenerational education enhances the possibilities of active aging for individuals and populations by providing opportunities for participation in society and increasing knowledge, skills, and competencies within the four foundational pillars of lifelong education. It teaches individuals to live together, to know, to do, and to be¹³.

This should be understood as a measure that reinforces social and intergenerational relationships. Through exchanges of knowledge, information, thoughts, ideas, feelings, experiences, skills, attitudes, among other aspects, intergenerational education contributes to the transformation of the individual. In this cooperation and participation of different generations, societal transformation can occur¹³.

Intergenerationality involves creating and promoting opportunities that underpin the construction of intergenerational relationships and foster intergenerational education beyond institutional education spaces. It thus promotes solidarity, interdependence, reciprocity, knowledge sharing, and transformation among individuals, contributing collectively to the construction of a fairer and more compassionate societal model¹³.

Therefore, intergenerational relationships are inseparable from social, economic, political, and cultural dimensions, with the educational dimension being fundamental. Intergenerationality is not limited to specific activities or mere contact between generations. Educating and learning in an intergenerational context are based on the theoretical and methodological framework of transformative education, such as in Paulo Freire's Critical Pedagogy. In this way, meaningful learning can be achieved beyond institutional spaces, such as schools and universities¹⁵.

In Paulo Freire's Critical Pedagogy, intergenerational education can find a foundation, contributing to the deschooling of education and the deinstitutionalization of older adults, as well as children and young people. It promotes intergenerational

citizenship and, through participatory and convivial experiences, contributes to a new public space for education. In this framework, teaching requires respecting autonomy, as per Freirean teachings, anchoring education between generations and bringing together different individuals who learn collectively. They are influenced by culture, history, or any chronological influences, allowing the reconstruction of concepts, information, and thoughts about individual and collective health promotion from an intergenerational perspective¹⁶.

Therefore, it is a challenge to provide strategies for intergenerational education in healthcare settings, emphasizing APS. Additionally, building intergenerational dialogue that facilitates individual and collective empowerment of older adults through active participation in the processes of knowledge construction and reconstruction is crucial.

Intergenerational Program: Protagonism for the Health Promotion of Older Adults

Based on the reflections presented earlier, what possibilities exist for creating intergenerational spaces to foster dialogue, thought, ideas, or even the deconstruction of prejudices and stigmas that support the protagonism of older adults, specifically in APS?

This topic begins with a question, acknowledging the complexity of building dialogic spaces, especially when involving different generations and the pandemic or post-pandemic context. However, it is a necessary and intriguing challenge, complex but feasible, to contemplate and reconsider health promotion for successful aging.

When reflecting on successful aging, it is anchored in three crucial points. The first point emphasizes health education to guide lifestyle choices and identify risk factors such as obesity, smoking, and sedentary behavior over the years. The absence of diseases is not the sole priority. Therefore, the second point is the maintenance of functional and cognitive capacity through multidimensional assessment, for example. The third point is the active and effective

participation of older adults in society, strengthening support networks to address their needs beyond illness. This latter point is a fundamental condition for considering the health promotion of older adults².

Therefore, for the development of an Intergenerational Program (IP), intergenerational relationships serve as the foundation for construction. These relationships can be understood as interactions between people from different generations, representing diverse life stages, historical, social, and cultural contexts. Such interactions allow for the exchange of experiences and content, contributing to the mutual growth and development of those involved. The generations interacting benefit when the perception of the need for interaction and the exchange of singularities in each individual's way of being, feeling, thinking, and wanting is felt through intergenerational encounters. These encounters are materialized by the intergenerational relationships established, whose main objective is the sharing of knowledge, the strengthening of relationships between younger and older individuals, and the inclusion of older adults in the teaching and learning process, especially when intergenerational education takes place in formal education spaces¹⁷.

In this way, IPs aim to build connections between these generations, fostering interaction and resulting in "intergenerational solidarity" that enhances the quality of life for both young and older individuals. Those participating in this generational exchange experience positive aspects in these new contacts, feeling more secure about themselves and the world, better coping with adversities, stress, and diseases¹⁸.

Among the benefits of IPs, discussions about ageism and overcoming stigmas related to aging are highlighted. This facilitates the restoration of self-esteem among the older population and strengthens generational bonds. Sharing knowledge through narratives and affection between generations can enhance socialization, contributing to minimizing the marginalization of older adults in society. It also provides younger individuals, including children and adolescents, with an understanding of the aging process from a different perspective, breaking down prejudices and stigmas that still persist in our society¹⁷⁻¹⁹.

Based on a theoretical review, several studies have emphasized the importance of encounters and methodologies that work with intergenerational approaches^{17, 20, 21}. However, the documentation of IPs as a continuous methodology for discussions and actions related to health promotion is still limited in the health field¹⁵⁻²². It is crucial to highlight that, in the construction of care, spaces for dialogue in health promotion provide a pathway for the community. Academic knowledge adds strength and enables the deconstruction and reconstruction of knowledge, potentially leading to positive and transformative changes in stigmatized attitudes between generations²²⁻²³.

The development of an IP in PHC, specifically in the FHS, is innovative in experiencing initiatives that seek, through the methodology of encounters, qualified listening, welcoming, orality, humanization, and meaningful learning, not only health prevention but health education as well. Through cross-cutting themes identified by the IP group, participants become actors in the construction and reconstruction of concepts about life cycles and the importance of diverse knowledge for improving quality of life.

CONCLUSION

The intergenerational education, even though still timidly envisioned, is present in institutionalized spaces of formal education, whether in schools and/or universities. However, successful experiences in health, specifically in spaces occupied by PHC, still appear limited or poorly visualized for the

construction of transformative education for the promotion of elderly health.

The challenge is to encourage scientific research so that professionals, through continuous education, can enhance health education moments through intergenerational education. Thus, the construction and implementation of Intergenerational Programs can represent a possibility.

AUTHORSHIP

- Ana Paula Ribeiro de Castro: Formal analysis, conceptualization, writing curation – First draft, writing – Editing review.
- Antônio Germane Alves Pinto: Formal analysis, conceptualization, writing curation – First draft, writing – Editing review. Validation and visualization.
- José Maria Ximenes Guimarães: Formal analysis, conceptualization, writing curation – First draft, writing – Editing review. Validation and visualization.
- Geanne Maria Costa Torres: Formal analysis, conceptualization, writing curation – Editing review.
- Ana Patrícia Pereira Morais: Formal analysis, conceptualization, writing curation – First draft, writing – Editing review. Validation and visualization.

Edited by: Yan Nogueira Leite de Freitas

REFERENCES

1. Castro APR. Promoção da Saúde, empoderamento e envelhecimento: visões dos profissionais da Estratégia Saúde da Família. In: Dias MAS, Forte FDS, Machado MFAS (org) Promoção da Saúde: um tecido bricolado. Sobral: Edições UVA; 2015. p. 71-87.
2. Nonato AAMPL. Envelhecimento bem-sucedido: desafios às políticas públicas em Manaus [Internet]. Emancipação. 2018 [access July 16, 2023] 18(2): 325-335. Available at: <https://revistas.uepg.br/index.php/emancipacao/article/view/8946/20920921038>
3. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health [Internet]. *Milbank Q*. 2005 [access 2023 July 16] 83(3):457-502. Available at: <https://doi.org/10.1111/j.1468-0009.2005.00409.x>
4. Pinto LF, Giovanella L. The family health strategy: expanding access and reducing hospitalizations due to ambulatory care sensitive conditions (ACSC) [Internet]. *Ciência & Saúde Coletiva*. 2018 [access 2023 July 16] 23(6):1903-1914. Available at: <https://doi.org/10.1590/1413-81232018236.05592018>

5. Cruz RR, Beltrame V, Dallacosta FM. Aging and vulnerability: an analysis of 1,062 elderly persons [Internet]. *Rev Bras Geriatr Gerontol*. 2019 [access 2023 July 16] 22(3):e180212. Available at: <https://doi.org/10.1590/1981-22562019022.180212>
6. Cantinho MSD. Envelhecimento, Intergeneracionalidade e Bem-estar: um estudo exploratório com um programa intergeracional [dissertação]. Portugal: Instituto Politécnico de Viana do Castelo; 2018 [access 2023 July 16]. Available at: <http://repositorio.ipv.pt/handle/20.500.11960/2052>
7. Brasil. Resolução nº 510, de 07 de abril de 2016. Dispõe sobre as normas aplicáveis a pesquisas em Ciências Humanas e Sociais [Internet]. *Diário Oficial [da] República Federativa do Brasil*, Brasília, DF, 24 maio 2016 [access 2023 July 16]. Available at: <http://bit.ly/2fmnKeD>
8. Ministério da Saúde (BR). Projeto Promoção da Saúde. Promoção da Saúde: Declaração de Alma-Ata, Carta de Ottawa, Declaração de Adelaide, Declaração de Sundsvall, Declaração de Santafé de Bogotá, Declaração de Jacarta. Brasília: Ministério da Saúde; 2001.
9. Araújo MFM, Almeida MI, Nóbrega-Therrien, SM. Educação em Saúde: Reflexões para a Promoção da Vigilância à Saúde. In: Rouquayrol MZ, Gurgel M, organizadores. 7.ed. Rio de Janeiro: MedBook; 2013. p. 633-651.
10. Brasil. Lei Nº 8. 842 de 4 de janeiro de 1994 [Internet]. Dispõe sobre a Política Nacional do idoso, cria o Conselho Nacional do Idoso e dá outras providências [access 2023 July 16]. Available at: https://www.planalto.gov.br/ccivil_03/leis/18842.htm
11. Brasil. Ministério da Saúde. Portaria Nº 2.528 de 19 de outubro de 2006. Aprova a Política Nacional de Saúde da Pessoa Idosa [Internet]. Brasília: Ministério da Saúde; 2006 [Access 2023 July 16]. Available at: <https://www.gov.br/mds/pt-br/acao-a-informacao/legislacao/antigos/portaria-ms-no-2-528-de-19-de-outubro-de-2006>
12. Castro APR, Vidal ECF, Saraiva ARB, Arnaldo SM, Borges AMM, Almeida MI. Promoting health among the elderly: actions in primary health care [Internet]. *Rev Bras Geriatr Gerontol*. 2018 [Access 2023 July 16] 21(2):158-167. Available at: <https://www.scielo.br/j/rbgg/a/tgCYh3yNmnhV7j6864xfTH/>
13. Ferreira FI. A educação intergeracional face ao discurso político do envelhecimento ativo [Internet]. *EccoS Rev Cient*. 2021 [access 2023 July 16] 56:e12820. Available at: <https://periodicos.uninove.br/eccos/article/view/12820/8811>
14. Castro APR de, Morais APP. Intergeneracionalidade e prevenção da gravidez na adolescência: um relato de experiência no programa saúde na escola. In: *Envelhecimento populacional: saúde, doenças, cuidados e serviços / organizadores, Manoel Freire de Oliveira Neto, et al. [...]. - Campina Grande: Realize Editora, 2022.*
15. Freire P. *Pedagogia da autonomia: saberes necessários à prática educativa*. 43. ed. São Paulo: Paz e Terra; 2011.
16. Nóvoa A. O espaço público da educação: Imagens, narrativas e dilemas. In: Nóvoa A, diretor. *Espaços de Educação, Tempos de Formação*. Lisboa: Fundação Calouste Gulbenkian; 2002. p. 237-263.
17. Ferreira ISVBS. Educação Intergeneracional como Estratégia de Promoção do Envelhecimento Ativo: análise da necessidade de uma comunidade local enquanto via fundamentadora de projetos relevantes e sustentáveis [tese]. Portugal: Faculdade de Psicologia e de Ciências da Educação da Universidade de Coimbra [Internet]; 2017 [Access 2023 July 16]. Available at: <https://estudogeral.uc.pt/handle/10316/43108>
18. Aguiar VFF, Soares TB, Anjos AFS, Paz JVC, Amorim JA, Torres MCS, Sousa JB et al. A intergeracionalidade entre idosos e adolescentes na busca da desconstrução de estereótipos na velhice: relato de experiência [Internet]. *REAS/EJCH*. 2019 [Access 2023 July 16] (23):e413. Available at: <https://acervomais.com.br/index.php/saude/article/view/413/412>
19. Luna WF, Melo JAB, Vaz CHM. Entre chegadas e partidas: conversas intergeracionais no Projeto de Extensão Saúde do idoso [Internet]. *Saúde em Redes*. 2019 [access 2023 July 16] 5(3):177-191. Available at: <http://revista.redeunida.org.br/ojs/index.php/redeunida/article/view/2429>
20. Piovezan M, Bessa TA, Borges FSPS, Prestes SM, Chubaci RYS. “Troca de cartas entre gerações”: projeto gerontológico intergeracional realizado em uma ILPI de São Paulo [Internet]. *Rev Kairós-Gerontologia*. 2015 [access 2023 July 16] 18(3):137-153. Available at: <https://doi.org/10.23925/2176-901X.2015v18i3p137-153>
21. Nishida W, Kupek E, Zanelatto C, Bastos JL. Mobilidade educacional intergeracional, discriminação e hipertensão arterial em adultos do Sul do Brasil [Internet]. *Cad Saúde Pública*. 2020 [Access 2023 July 16] 36(5):e00026419. Available at: <https://www.scielo.br/j/csp/a/tXpDjJt7Dz4dBrCzgPZPdBj/>

22. Comodo CN, Prette AD, Prette ZAPD. Intergeracionalidade das Habilidades Sociais entre Pais e Filhos Adolescentes [Internet]. *Psic.: Teor. e Pesq.* 2017 [Access 2023 July 16] 33:e33311. Available at: <https://www.scielo.br/j/ptp/a/yDv6LMPGbfWQnTrQkzY74Sn/abstract/?lang=pt>
23. Krug RR, Ono LM, Figueiró TH, Xavier AJ, d'Orsi E. Programa intergeracional de estimulação cognitiva: Benefícios relatados por idosos e monitores participantes [Internet]. *Psic.: Teor. e Pesq.* 2019 [Access 2023 July 16] 35:e3536. Available at: <https://www.scielo.br/j/ptp/a/bWjHcbtbZDFx9B6fWnKmrWJ/?lang=pt>



Balance, falls, and risk of falls in COPD: systematic review of assessment instruments, measurement properties, and clinical utility

Ana Cristina Lamezon¹ 

Bruna Luna Cavan¹ 

Silvia Valderramas¹ 

Abstract

Objectives: to identify balance assessment instruments, issues and risks of issues used in COPD, evaluate their measurement properties, quality of evidence and clinical utility.

Method: A review was produced following the PRISMA and COSMIN guidelines, registered in PROSPERO: CRD42021235118. Searches were carried out from November 2021 to September 2022 in the PubMed, LILACS, CINAHL, Embase, Web of Science and PEDro databases. Cross-sectional and cohort observational studies were included, without restrictions on language or year of publication, as long as they described clinical instruments for assessing balance, falls and risk of falls reporting at least one of the measurement properties: validity, reliability and responsiveness. Two reviewers will independently apply the eligibility criteria, travel risk by COSMIN, quality of evidence by the GRADE approach and assessment of clinical utility by the Tyson and Connell Scale. **Results:** 9,102 studies were selected and 21 included in the review, nine studies demonstrated adequate and sufficient measurement properties and 12 instruments were identified, of which six were evaluated for the quality of evidence. **Conclusion:** Systematic reviews of measurement properties require specialized reviewers and skills in qualitative analysis. With a recommendation GRADE of “A”, the Berg Balance Scale (BBS) and the Timed Up and Go (TUG) test were the most recommended instruments for COPD. By requiring the evaluation of the clinical utility of the result, the TUG demonstrates superiority to the BBS, proving to be a great tool for judging individuals who need a thorough assessment of balance, falls and risk of falls.

Keywords: Chronic Obstructive Pulmonary Disease. Balance. Falls. Risk of falls. Measurement properties.

¹ Universidade Federal do Paraná (UFPR), Programa de Pós Graduação de Medicina Interna e Ciências de Saúde. Curitiba, PR, Brasil.

There was no funding for the execution of this work.

The authors declare that there is no conflict in the conception of this work.

Correspondence
Silvia Valderramas
svalderramas@uol.com.br

Received: July 31, 2023
Approved: December 22, 2023

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable and treatable disease, characterized by persistent respiratory symptoms and the presence of airflow limitation¹⁻⁴. The impairment of COPD is not limited to respiratory function^{4,5}. People with COPD have impaired postural control when compared to healthy individuals in the same age group⁵⁻⁷. Deficits in function and mobility have been associated with a greater risk of falls in older adults⁷ and have a negative impact on quality of life⁸⁻¹⁰.

Studies suggest that COPD is one of the chronic diseases with the highest prevalence of falls^{1,5,6}. In a study with a sample of 4,050 women, aged between 60 and 79 years, the prevalence of falls increased with the number of chronic diseases. The population attributable risk of having suffered at least one fall in the last 12 months estimated by adjustable models was 17.4% (10.4% to 23.9%) for arthritis, 9.4% (5.4% to 13.3%) for depression, 8% (3.3% to 12.4%) for COPD, 6.2% (1.6% to 10.5%) for circulatory diseases and 6.2% (2% to 10%) for coronary heart disease¹¹. Falls are associated not only with mortality and morbidity, but also with loss of autonomy^{5,6,8}. Physiological mechanisms, such as changes in muscle strength, proprioception, body sway and compromised balance, may be associated with a greater risk of falls in COPD and contribute to worsening health conditions⁷⁻¹³. Research has highlighted the importance of identifying risk factors for falls and promoting prevention^{14, 15}. For prevention to be effective, it is necessary to identify the population at risk, introduce standardized and reliable assessment measures, and then establish specific multidimensional interventions focused on reducing the identified modifiable risk factors^{10, 13, 14}.

The instruments for assessing balance, falls and risk of falls when applied to COPD allow professionals to identify and quantify possible deficits found in balance, the presence of falls and the risk of a fall occurring. Such instruments allow monitoring of these changes and favor appropriate clinical decision-making aimed at better intervention. Instruments must be valid, reliable and responsive, otherwise there is a risk of obtaining results that could lead to erroneous conclusions and conduct^{6, 16, 17}.

Systematic reviews of outcome measurement instruments are important tools for selecting the most appropriate instrument for the construct of interest and providing an overview of quality through measurement properties¹⁶⁻²⁰. Therefore, it is important to determine whether the available assessment instruments capture all dimensions related to the construct. A better understanding of measurement properties will help professionals select the most appropriate instruments to use in their clinical practice.

A wide variety of instruments to measure balance, falls, and fall risk can be used in COPD. Our objective was to identify instruments for assessing balance, falls and risk of falls used in COPD, evaluate their measurement properties, quality of evidence and clinical utility.

METHOD

This systematic review complies with PRISMA and COSMIN guidance for systematic reviews of outcome measurement instruments and the protocol has been registered with PROSPERO: CRD42021235118. This review included cross-sectional observational and cohort studies of adults aged 50 years or over, diagnosed with COPD, in accordance with international guidelines^{1,3}, regardless of gender or level of disability. Studies that reported balance, falls and risk of falls instruments including tests, scales or questionnaires, methodological studies that developed the instruments and/or evaluated their measurement properties reporting the evaluation of at least one of the following measurement properties were eligible: validity, reliability and responsiveness. Case studies and series reports, study protocols, clinical trials and studies not available in their entirety were excluded. Classifications were agreed upon by consensus among the review team to reduce variability in interpretation.

An extensive literary search was carried out in electronic databases from November 2021 to September 2022 in the *PubMed*, LILACS, CINAHL, *Embase*, *Web of Science* and PEDro databases. The search did not restrict language or year of publication. The search strategy was carried out for each database,

including controlled database vocabulary when available (MeSH, Emtree and CINAHL *Subjective Headings*) and free terms with the combination of the words “Chronic Obstructive Pulmonary Disease”, “balance”, “falls”, “risk of falls”. Then the words “measurement properties”, “reliability”, “validity” and “reproducibility” were added with the purpose of increasing the sensitivity of the research and adapting it to the COSMIN methodology.

Two reviewers (A.L. and B.L.) independently applied the eligibility criteria for the selection of studies, such as study objectives, population characteristics, clinical measure evaluated, measurement instruments, examiners, operationalization of measures and type of statistical analysis. Another reviewer (S.V.) was requested in case of disagreement or doubt. All collected data was allocated to the *Mendelley* reference management program and reference analysis was performed manually. After removal of duplicates, reviewers (A.L. and B.L.) independently screened titles and abstracts followed by full-text screening in a blinded manner using standardized electronic forms. Disagreements were resolved by consensus.

Two researchers independently (A.L. and B.L.) analyzed the quality of the included studies through the *Consensus-based in COSMIN Risk of Bias tool to assess the quality of studies on reliability and measurement error of outcome measurement instrument*¹⁵⁻¹⁹. The *COSMIN Risk of Bias tool* tracks the risk of bias of the individual studies included and describes the elements that together assist us in constructing a research question and provides a comprehensive overview of the components of the outcome measure as well as the design requirements and preferred statistical methods regarding instrument measurement reliability and error.

The classification of instrument evidence was performed using the GRADE approach modified by COSMIN.

Two independent researchers (A. L. and B. L.) evaluated the clinical utility of the measurement instruments found in the systematic review using the Tyson and Connell clinical utility scale²⁰ which evaluates four items: instrument application time, data analysis and interpretation, cost, need for equipment and specific training, and portability. The

final score quantifies whether a specific instrument can be used and recommended for clinical practice. For the instrument to be recommended, it must have a score greater than or equal to nine.

DATA AVAILABILITY

The entire dataset supporting the results of this study is available upon request from the corresponding author [Ana Cristina Lamezon]

RESULTS

The search strategy identified 9,102 studies. The results of the database search and the selection process are detailed in Figure 1. Of this total, 21 studies met the eligibility criteria and were included in this systematic review and 12 instruments for assessing balance, falls and risk of falling were found. Participant characteristics in the included studies are summarized in Table 1.

The instruments for assessing balance, falls and risk of falls found in this review were categorized into performance instruments (PerFORM): *Berg Balance Scale* (BBS), *Balance Evaluation Systems Test* (BESTest), *MINI-BESTest*, *Brief-BESTest*, *Timed up and Go* (TUG), *Timed up and Go dual task* (TUGDT), *Single-Leg Stance* (SLS), *Tinetti get up and go test*, *Unipedal Stance Test* (UST); Instruments with results reported by the evaluator, (ClinROM): *Force platform or posturography*; Self-report questionnaires (PROM): self-report of falls and the *Elderly Falls Screening Test* (EFST).

The risk of bias of the included studies according to *COSMIN Risk of Bias checklist*⁹⁻¹² is presented in Table 2. The main measurement properties evaluated were reliability, internal consistency and construct validity. Criterion validity was demonstrated only in one study where the abbreviated MiniBESTest instrument was validated from BESTest. Of the 21 studies included, nine presented measurement properties considered adequate and sufficient, five adequate and insufficient, one adequate and indeterminate, four studies were classified as doubtful and insufficient and one study classified as doubtful and indeterminate following the COSMIN methodology.

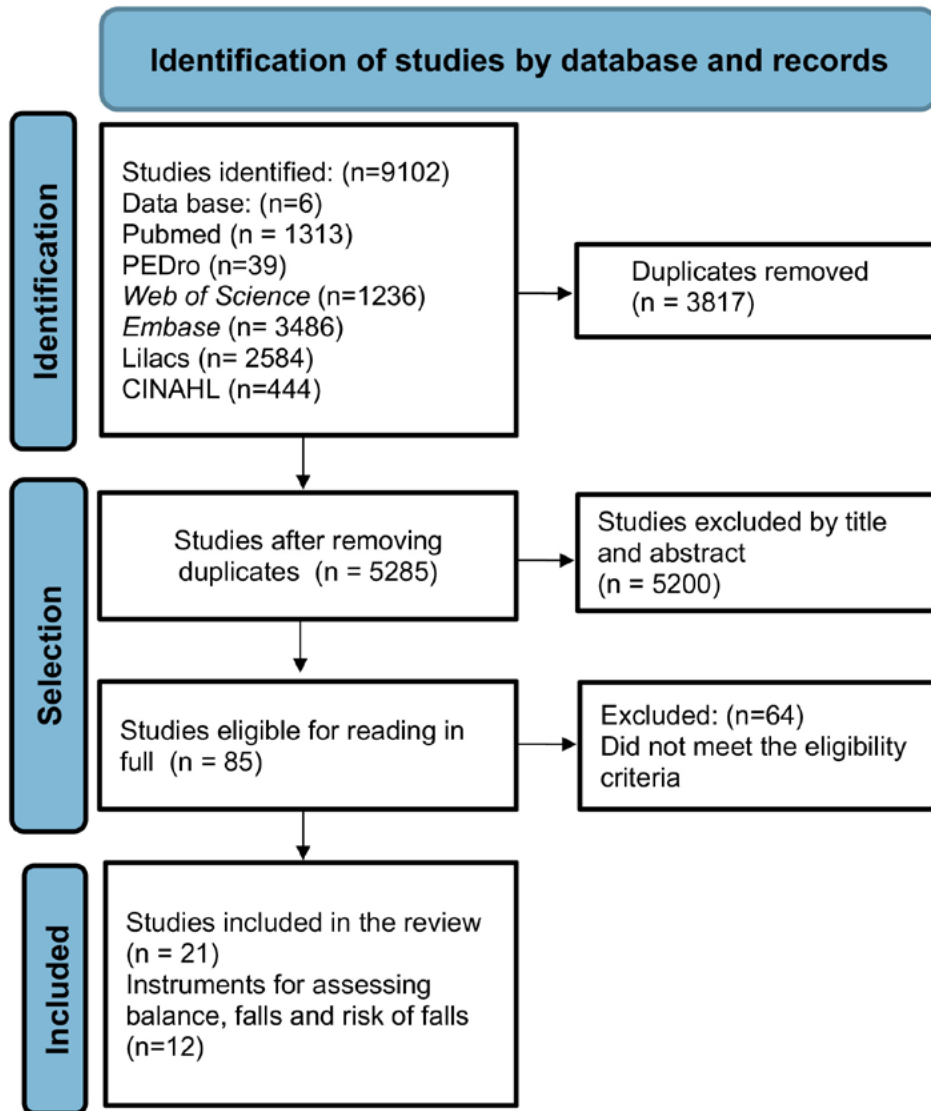


Figure 1. Flowchart of study selection according to the *Preferred Reporting Items for systematic Reviews and Meta-Analyses*. Curitiba, PR, Brazil, 2023.

Table 1. Characteristics of the studies included in the Systematic Review. Curitiba, PR, Brazil, 2023.

Studies	COPD (n)	M (n)	F (n)	COPD Sta (n)	COPD Exa (n)	Contr (n)	Age (years)	Smo (a/m)	O ₂ Sup (n)	FEV ₁ (%pred)	Falls 12m (n)
Mclay et al. ²¹	86	45	41	86	0	0	72.9(±6.8)	46.0(±27.0)	25(±29.1)	47.3(±20.3)	34
Crisan et al. ²²	46	NM	NM	29	17	0	62.5(±5.0)	>10	NM	NM	17
Jacome et al. ²³	46	24	22	46	0	0	75.9 (±7.1)	NM	NM	69.4(±19.9)	23
Oliveira et al. ²⁴	40	19	21	40	0	25	71(±8.1)	49.6 (±25.8)	18	45.1(±16.2)	13
Ozalevli et al. ²⁵	36	25	11	36	0	20	70.3(±3.0)	42.1(±11.2)	NM	43.5(±6)	10
Voica et al. ²⁶	27	NM	NM	27	0	17	NM	>10	NM	NM	NM
Nantsupawat et al. ²⁷	14	8	6	14	0	0	69.7(±6.0)	NM	3(±21.4)	36.9(±.6)	3
Muti et al. ²⁸	50	NM	NM	50	0	0	66.2(±8.2)	NM	NM	51.8(±15.9)	23
Porto et al. ²⁹	132	72	60	132	0	39	67.3(±10)	49.1(±23)	NM	89.2(±23.6)	35
Hellstrom et al. ³⁰	80	29	51	80	0	0	65(±9.0)	NM	NM	47.5(±13)	20
Park et al. ³¹	34	14	20	34	0	22	68.9(±1.3)	NM	20	44.1(±3.1)	21
Mkacher et al. ³²	60	NM	NM	60	0	0	61.2(±3.2)	0	NM	58.6(±8.6)	NM
Beauchamp et al. ⁸	39	18	21	39	0	0	71.1(±6.8)	>10	18	41.5(±17)	18
Al Haddad et al. ³³	132	74	62	132	0	58	68(±8.0)	46.0(±26)	NM	59(±18)	27
Singh et al. ³⁴	41	38	3	41	0	41	NM	NM	0	47.6(±17.9)	NM
Pereira et al. ³⁵	70	46	23	70	0	0	67(±9.3)	56.0 (±38.2)	0	42.7(±14.2)	29
Harrison et al. ³⁶	32	17	15	32	0	0	68.5(±9.9)	62.3 (±30.4)	NM	38.2(±14.7)	NM
Roig et al. ¹⁴	20	NM	NM	20	0	20	72.3(±6.7)	NM	0	46.7(±13.0)	4
Roig et al. ³⁷	101	56	45	101	0	0	NM	NM	31	43.4(±36.9)	32
Tudorache et al. ³⁸	61	NM	NM	22	19	20	60(±4.0)	>20	0	27.5(±7.0)	NM
De Castro et al. ³⁹	72	27	20	47	0	25	68(±5.0)	NM	NM	45(±15)	NM

n: sample; M: masculine; F: feminine; DPOC sta: DPOC stable; DPOC exa: DPOC exacerbated; Control: control group; smo: smoking; a/m: anos/maco; O₂ Sup: supplemental oxygen; FEV₁: Expiratory volume in the first second; %pred: predicted percentage; NM: not mentioned; Falls 12m: number of falls in the last 12 months. Source: the author.

Table 2. Risk of bias according to COSMIN Risk of Bias Checklist. Curitiba, PR, Brazil, 2023.

Study	Year	Content Validity	Construct Validity	Internal Cons.	Transcultural Validity	Reliab.	Measure Error	Criterion Validity	Hypot. Test	Respons.	Final Class.
Mclay et al. ²¹	2020	A/+	N/I	N/I	N/I	N/I	N/I	N/I	O/+	N/I	A/+
Harrison et al. ³⁶	2019	A/+	N/I	N/I	N/I	N/I	N/I	N/I	A/+	A/-	A/-
Voica et al. ²⁶	2016	A/?	N/I	N/I	N/I	N/I	N/I	N/I	A/-	N/I	A/?
Hellstrom et al. ³⁰	2009	A/?	N/I	N/I	D/?	N/I	N/I	N/I	D/-	N/I	D/-
Nantsupawat et al. ²⁷	2015	A/?	N/I	N/I	N/I	N/I	N/I	N/I	D/-	N/I	D/-
Muti et al. ²⁸	2019	A/+	N/I	N/I	N/I	A/+	N/I	N/I	A/+	N/I	A/+
Roig et al. ¹⁵	2012	A/-	N/I	N/I	N/I	N/I	N/I	N/I	D/?	N/I	D/?
Porto et al. ²⁹	2017	A/+	N/I	N/I	N/I	A/+	N/I	N/I	A/+	N/I	A/+
Jacome et al. ²³	2016	A/+	N/I	N/I	N/I	A/+	A/-	A/+	A/+	N/I	A/-
Park et al. ³¹	2020	A/+	N/I	N/I	N/I	N/I	N/I	N/I	A/+	N/I	A/+
Mkacher et al. ³²	2017	A/+	N/I	N/I	N/I	A/+	A/-	N/I	A/+	N/I	A/-
de Castro et al. ³⁹	2016	A/+	N/I	N/I	N/I	N/I	N/I	N/I	A/+	N/I	A/+
Al Haddad et al. ³³	2016	A/+	N/I	N/I	N/I	A/+	N/I	N/I	A/+	N/I	A/+
Tudorache et al. ³⁸	2015	A/-	N/I	N/I	N/I	N/I	N/I	N/I	A/+	N/I	A/-
Ozalevli et al. ²⁵	2011	A/-	N/I	N/I	N/I	N/I	N/I	N/I	A/-	N/I	A/-
Singh et al. ³⁴	2019	A/-	N/I	N/I	N/I	N/I	N/I	N/I	D/-	N/I	D/-
Pereira et al. ³⁵	2019	A/+	N/I	N/I	A/+	N/I	N/I	A/+	A/+	N/I	A/+
Beauchamp et al. ⁸	2009	A/+	N/I	N/I	N/I	N/I	N/I	N/I	A/+	N/I	A/+
Oliveira et al. ²⁴	2015	A/+	N/I	N/I	N/I	N/I	N/I	N/I	A/+	N/I	A/+
Roig et al. ³⁷	2011	A/+	N/I	N/I	N/I	N/I	N/I	N/I	A/+	N/I	A/+

Internal Cons.: internal consistency; Transcultural Validity: transcultural validity; Reliab.: reliability; Hypot. Test.: hypothesis testing; Respons.: responsiveness; Final Class.: final classification; Quality of study development: "O": excellent or very good; "A+": adequate; "A?": doubtful; "I": inadequate; Quality of studies on measurement properties: "+": sufficient; "-": insufficient; "?": indeterminate; "±": inconsistent; "N/I": not investigated. Source: the author.

After consensus among the authors, we chose to analyze only the assessment instruments of the included studies that presented adequate and sufficient measurement properties. The reliability domain was the most addressed in these studies (five studies) and the quality of the evidence in these instruments was determined through the modified GRADE approach and characterized by the level of evidence in A, B or C. Instruments classified as “A” have sufficient evidence to recommend their use in COPD, “B” are not recommended and “C” require further studies for recommendation and are presented in Table 3.

The BBS and TUG instruments presented an “A” rating for quality of evidence, and are recommended

for assessing balance and risk of falls in COPD. The BESTest, MiniBESTest, BriefBEST-test and UST instruments were classified as moderate “C” evidence and require further studies for recommendation. None of the instruments included in this review with measurement properties classified as adequate and sufficient were classified as “B”.

The Tyson and Connell Scale²⁰ was applied to instruments that presented adequate and sufficient measurement properties according to the risk of bias and quality of evidence. We observed that most instruments obtained the maximum score (9/10 or 10/10) in the assessment of clinical utility, as can be seen in Table 4.

Table 3. Quality of evidence according to modified GRADE. PR, Brazil, 2023

Instrument	ICC	Sample	Quality of evidence	Recommendation
BBS	0.82-0.93	106	High	A
BESTest	0.87	46	Low	C
MiniBESTest	0.88	46	Low	C
TUG	0.91-0.95	237	High	A
Brief-BESTTest	0.82	46	Low	C
UST	0.91	60	Moderate	C

BBS: *Berg Balance Scale*; BESTest: *Balance Evaluation Systems Test*; TUG: *Timed up and Go*; UST: *Unipedal Stance Test*; Variation-ICC: upper and lower limits of intraclass correlation; n: sample; A: recommended instrument; C: instruments with the possibility of recommendation.

Table 4. Clinical utility of measuring instruments. Curitiba, PR, Brasil, 2023.

Instrument	Administration time	Total cost	Equipment portability	Equipment training	Final score
BBS	2	3	2	2	9
BESTest	1	3	2	2	8
MiniBESTest	2	3	2	2	9
TUG	3	3	2	2	10
Brief-BESTTest	3	3	2	2	10
UST	3	3	2	2	10

BBS: *Berg Balance Scale*; BESTest: *Balance Evaluation Systems Test*; TUG: *Timed up and go*; UST: *Unipedal Stance Test*.

DISCUSSION

This systematic review was designed to determine the most appropriate balance, falls and fall risk assessment instruments for use in COPD and provide a comprehensive view of the properties of measurements found in the literature and provide support for recommendation in clinical practice with sufficient evidence.

The selection of included instruments was based on evidence of the quality of the outcome of these measurement instruments (i.e. reliability, validity and responsiveness) as well as aspects of feasibility or clinical utility following the COSMIN initiative criteria and clinical utility scale by Tyson and Connell²⁰. We identified the following balance, falls and risk of falls instruments used in COPD: (1) BBS - assesses functional balance and risk of falls; (2) BESTest, MiniBESTest and BriefBESTest - static and dynamic balance; (3) TUG and TUGDT - functional mobility and risk of falls, (4) SLS, Tinetti Test, UST and posturography, assessment of static balance, (5) EFST and Self-report of falls - assessment of retrospective falls. Of the 12 instruments found, only six presented sufficient quality of evidence for some degree of recommendation in COPD. The quality of evidence was assessed only in instruments included in studies with at least adequate quality in the development of the study and sufficient reliability assessment^{15,16}.

Every instrument must reflect the internal structure of the construct, that is, the empirical structure of the instrument must reflect the theoretical structure that must be covered by the measure. The assessment of the internal structure, which comprises structural validity, internal consistency, cultural validity, will only be relevant if the instrument is composed of multiple items and based on a reflective model, which assumes that all items of a scale or subscale are manifestations of an underlying construct^{14,19}.

Regarding cross-cultural validity, although many original versions have been translated into other languages or adapted to other cultures, we identified only three studies that cited validations^{23,31,35}, that is, they did not evaluate such a measure and only

in one study the property was evaluated and it was classified as adequate³⁵. Such studies are necessary to assess whether measurements from a population of a given culture are equivalent to those from another population.

The most frequently found measurement property, and for which the instruments showed sufficient evidence, was the hypothesis test for construct validity, where only four studies presented doubtful classification. Authors often use the term criterion validity for studies in which an instrument is compared to others that measure a similar construct. In most cases, this would be considered evidence for construct validity, rather than criterion validity following the considerations of the COSMIN methodology. Its definitions and analyzes must be demonstrated in hypothesis testing for construct validity¹⁵⁻¹⁹.

Criterion validity is the degree to which an instrument's scores are a reflection of a "gold standard"¹⁵⁻¹⁸. Based on the COSMIN guidelines, we agree that there is no gold standard for the identified instruments^{15,17,18}, unless the instrument has a long and a short form. In this case, the full version of a measure is the "gold standard" of the short form¹¹. In our study, criterion validity was only scored in the MiniBEST and BriefBESTest instruments, which are summarized versions of BESTest^{23,32}.

The reliability domain through test-retest was evaluated in seven studies with adequate and sufficient measures^{22,27,28,31,32}. The measurement error was reported in only two studies and with insufficient data for an adequate classification^{22,31}.

We identified that the BBS and TUG were the most appropriate instruments for COPD, with a recommendation grade of "A", but in the clinical utility criterion²⁰ the TUG stood out due to the shorter application time compared to the BBS, which proves to be useful for screening patients who will require a more in-depth balance assessment^{14,19}. With recommendation grade B, the BESTest, MiniBESTest, BriefBESTest and UST instruments can be provisionally recommended until new studies are developed, mainly because in the studies found with adequate and sufficient evidence the number of participants was below 100, which according to

the Modified GRADE¹⁵ evaluation is enough to downgrade the evidence.

Broad, comprehensive and sensitive database research and the use of rigorous methodology are aspects to be highlighted in this review. The studies were independently reviewed, as recommended by COSMIN's best evidence, in accordance with the *Cochrane* methodology. Classifications were agreed upon by consensus among the review team to reduce variability in interpretation.

As an eligibility criterion, our study sought individuals diagnosed with COPD aged 50 years or older. Most of the included studies fully met this criterion, but in the study by Singh et al³⁴ part of the recruited sample was aged over 40 years. It is possible that in a younger population with COPD, the recommendations of this study cannot be extrapolated.

As there are currently no standards and criteria for content validity, face validity, which is a very subjective judgment about whether the content of the instrument really appears to be an adequate reflection of the construct being measured, the evaluation of this criterion by reviewers may suffer from interpretation bias.

As no instrument was developed for COPD specifically, content validity was assumed and classified as adequate, since during the validation process for other diseases the instrument was analyzed and presents relevant, comprehensive and understandable items with regard to the construct of interest. It would be interesting that in future validation studies of measurement instruments for COPD, content validity is carried out for this specific population.

CONCLUSION

Systematic reviews of measurement properties are complex and involve reviewers with knowledge of the construct of interest, experience in the target population, and expertise in measurement properties and qualitative analysis. Researchers and professionals

who are deciding on the most appropriate balance, falls, and fall risk measurement instrument for use in COPD can often find multiple instrument models, and the recommendations noted in this systematic review can assist in making the most appropriate clinical decision about the use of these instruments.

BBS and TUG were the instruments with the highest degree of recommendation for application in COPD, but in the clinical utility criterion, the TUG stood out due to the shorter application time.

This review identifies gaps in the presence of quality evidence in available measurement instruments and therefore provides a useful framework both for further evaluations of these instruments and for the development of new specific instruments to assess balance, falls and risk of falls in COPD. The results of this review will also help researchers and healthcare professionals make evidence-based decisions about the use of these measurement instruments.

AUTHORSHIP

- Ana Cristina Lamezon - Conception, design or analysis and interpretation of data; writing the article or its critical review; approval of the version to be published; responsible for all aspects of the work, ensuring that issues related to the accuracy or integrity of any part of the work are addressed.
- Bruna Cavon Luna - Analysis and interpretation of data; writing of the article; critical review; approval of the version to be published; responsible for all aspects of the work, ensuring that issues related to the accuracy or integrity of any part of the work are addressed.
- Silvia Valderramas - Conception, design or analysis and interpretation of data; writing the article or its critical review; approval of the version to be published; responsible for all aspects of the work, ensuring that issues related to the accuracy or integrity of any part of the work are addressed.

Edited by: Marquiony Marques dos Santos

REFERENCES

- Global Initiative for Chronic Obstructive Lung Disease. Global Strategy for the Diagnosis, Management and Prevention of Chronic Obstructive Pulmonary Disease 2022 Report; 2022 [cited:22 Nov 6]. Available from : https://goldcopd.org/wp-content/uploads/2021/12/GOLD-REPORT-2022-v1.1-22Nov2021_WMV.pdf
- Agustí A, Celli BR, Criner GJ, Halpin D, Anzueto A, Barnes P, et al. Global Initiative for Chronic Obstructive Lung Disease 2023 Report: GOLD Executive Summary. *European Respiratory Journal*[internet]. 2023. [cited: 2023 Mar 1]; 1;61(4):2300239. Available from : <https://erj.ersjournals.com/content/61/4/2300239>
- Celli B, Fabbri L, Criner G, Martinez FJ, Mannino D, Vogelmeier C, et al. Definition and Nomenclature of Chronic Obstructive Pulmonary Disease: Time for Its Revision. *American Journal of Respiratory and Critical Care Medicine* [Internet]. 2022 [cited: 2023 de Feb 10]; 1;206(11):1317–25. Available from: <https://doi.org/10.1164/rccm.202204-0671PP>
- Kovelis D, Gomes ARS, Mazzarin C, Biazim SK, Pitta F, Valderramas S. Effectiveness and Safety of Supervised Home-Based Physical Training in Patients With COPD on Long-term Home Oxygen Therapy: A Randomized Trial. *Chest* [Internet]. 2020; 158(3): 965-72. Available from: <https://doi.org/10.1016/j.chest.2020.02.063>
- Mazzarin CM, Silveira BR, Lamezon AC, Cavon Luna B, Valderramas S. Effectiveness and Safety of Multicomponent Physical Training in Patients With Chronic Obstructive Pulmonary Disease: Protocol for a Randomized Clinical Trial. *Health Services Insights* [Internet]. 2023; 16. Available from: <https://doi.org/10.1177/11786329231169255>
- Scremim CF, Simões B, de Barros JA, Valderramas S. Construct validity and reliability of the Brazilian version of the Falls Efficacy Scale in patients with COPD. *Pulmonology*[Internet]. 2020;26(5):268-74. Available from: <https://doi.org/10.1016/j.pulmoe.2020.01.008>
- Butcher SJ, Meshke JM, Sheppard MS. Reductions in Functional Balance, Coordination, and Mobility Measures Among Patients With Stable Chronic Obstructive Pulmonary Disease. *Journal of Cardiopulmonary Rehabilitation*[Internet]. 2004;24(4):274–80. Available from: <https://doi.org/10.1097/00008483-200407000-00013>
- Beauchamp MK. Balance assessment in people with COPD: An evidence-based guide. *Chronic Respiratory Disease* [Internet]. 2019;16. Available from: <https://doi.org/10.1177/1479973118820311>
- Beauchamp MK, Hill K, Goldstein RS, Janaudis-Ferreira T, Brooks D. Impairments in balance discriminate fallers from non-fallers in COPD. *Respiratory medicine* [Internet]. 2009;103(12):1885-91. Available from: <https://doi.org/10.1016/j.rmed.2009.06.008>
- Lu H, Dong XX, Li DL, Wu Q, Nie XY, Xu Y, et al. Prevalent falls, fall frequencies and health-related quality of life among community-dwelling older Chinese adults. *Quality of Life Research*[Internet]. 2023;32(11):3279–89. Available from: <https://doi.org/10.1007/s11136-023-03474-2>
- Lawlor DA, Patel R, Ebrahim S. Association between falls in elderly women and chronic diseases and drug use: cross sectional study. *BMJ*[Internet]. 2003;327(7417):712-7. Available from: <https://doi.org/10.1136/bmj.327.7417.712>
- Pérez-Ros P, Martínez-Arnau FM, Tarazona-Santabalbina FJ. Risk Factors and Number of Falls as Determinants of Quality of Life of Community-Dwelling Older Adults. *Journal of Geriatric Physical Therapy*[Internet]. 2019;42(2):63-72. Available from: <https://doi.org/10.1519/jpt.0000000000000150>
- Almeida CNS, Costa RA da, Manso KP, Ferreira JF, Callegari B, Oliveira CC, et al. Static balance in older adults with chronic obstructive pulmonary disease undergoing pulmonary rehabilitation. *Geriatrics, Gerontology and Aging*[Internet]. 2020;14(2):98–107. Available from: <https://doi.org/10.5327/z2447-212320201900091>
- Roig M, Eng JJ, Road JD, Reid WD. Falls in patients with chronic obstructive pulmonary disease: a call for further research. *Respiratory medicine* [Internet]. 2009;103(9):1257–69. Available from: <https://doi.org/10.1016/j.rmed.2009.03.022>
- Mokkink LB, de Vet HCW, Prinsen CAC, Patrick DL, Alonso J, Bouter LM, et al. COSMIN Risk of Bias checklist for systematic reviews of Patient-Reported Outcome Measures Quality of Life Research [Internet]. 2017;27(5):1171–9. Available from: <https://doi.org/10.1007/s11136-017-1765-4>
- Mokkink LB, Boers M, van der Vleuten CPM, Bouter LM, Alonso J, Patrick DL, et al. COSMIN Risk of Bias tool to assess the quality of studies on reliability or measurement error of outcome measurement instruments: a Delphi study. *BMC Medical Research Methodology*[Internet]. 2020; Available from: <https://doi.org/10.1186/s12874-020-01179-5>

17. Gagnier JJ, Lai J, Mokkink LB, Terwee CB. COSMIN reporting guideline for studies on measurement properties of patient-reported outcome measures. *Quality of Life Research* [Internet]. 2021; 30(8): 2197–218. Available from: <https://doi.org/10.1007/s11136-021-02822-4>
18. Mokkink LB, Eekhout I, Boers M, van, de C. Studies on Reliability and Measurement Error of Measurements in Medicine – From Design to Statistics Explained for Medical Researchers [Internet]. 2023; 14: 193–212. Available from: <https://doi.org/10.2147/prom.s398886>
19. Winser SJ, Kannan P, Bello UM, Whitney SL. Measures of balance and falls risk prediction in people with Parkinson's disease: a systematic review of psychometric properties. *Clinical Rehabilitation* [Internet]. 2019;33(12):1949–62. Available from: <https://doi.org/10.1177/0269215519877498>
20. Tyson S, Connell L. The psychometric properties and clinical utility of measures of walking and mobility in neurological conditions: a systematic review. *Clinical Rehabilitation* [Internet]. 2009;23(11):1018–33. Available from: <https://doi.org/10.1177/0269215509339004>
21. McLay R, Kirkwood RN, Kuspinar A, Richardson J, Wald J, Raghavan N, et al. Validity of balance and mobility screening tests for assessing fall risk in COPD. *Chronic Respiratory Disease* [Internet]. 2020;17. Available from: <https://doi.org/10.1177/1479973120922538>
22. Crişan AF, Oancea C, Timar B, Fira-Mladinescu O, Tudorache V. Balance impairment in patients with COPD. *PloS one* [Internet]. 2015;10(3): e0120573. Available from : <https://doi.org/10.1371/journal.pone.0120573>
23. Jácome C, Cruz J, Oliveira A, Marques A. Validity, Reliability, and Ability to Identify Fall Status of the Berg Balance Scale, BESTest, Mini-BESTest, and Brief-BESTest in Patients With COPD. *Physical therapy* [Internet]. 2016;96(11):1807–15. Available from: <https://doi.org/10.2522/ptj.20150391>
24. Oliveira CC, McGinley J, Lee AL, Irving LB, Denehy L. Fear of falling in people with chronic obstructive pulmonary disease. *Respir Med* [Internet]. 2015;109(4):483-9. Available from: <https://doi.org/10.1016/j.rmed.2015.02.003>
25. Ozalevli S, Ilgin D, Narin S, Akkoçlu A. Association between disease-related factors and balance and falls among the elderly with COPD: a cross-sectional study. *Aging Clinical and Experimental Research* [Internet]. 2011;23(5-6):372–7. Available from: <https://doi.org/10.1007/bf03325235>
26. Voica A ,Oancea C, Tudorache E, Crisan A, Fira-Mladinescu O, Tudorache V, et al. Chronic obstructive pulmonary disease phenotypes and balance impairment. *International Journal of Chronic Obstructive Pulmonary Disease* [Internet]. 2016; 11(1):919-925. Available from: <https://doi.org/10.2147/COPD.S101128>
27. Nantsupawat N, Lane P, Siangpraipunt O, Gadwala S, Nugent K. Gait Characteristics in Patients With Chronic Obstructive Pulmonary Disease. *Journal of Primary Care & Community Health* [Internet]. 2015;6(4):222–6. Available from: <https://doi.org/10.1177/2150131915577207>
28. Reynaud V, Muti D, Pereira B, Greil A, Caillaud D, Richard R, et al. A TUG Value Longer Than 11 s Predicts Fall Risk at 6-Month in Individuals with COPD. *Journal of Clinical Medicine* [Internet]. 2019;8(10):1752. Available from: <https://doi.org/10.3390/jcm8101752>
29. Porto EF, Pradella CO, Rocco CM, Chueiro M, Jr., Maia RQ, Ganança FF, et al. Comparative Postural Control in COPD Patients and Healthy Individuals During Dynamic and Static Activities. *Journal of Cardiopulmonary Rehabilitation and Prevention* [Internet]. 2017;37(2):139–45. Available from: <https://doi.org/10.1097/HCR.0000000000000246>
30. Hellström K, Vahlberg B, Urell C, Emtner M. Fear of falling, fall-related self-efficacy, anxiety and depression in individuals with chronic obstructive pulmonary disease. *Clinical Rehabilitation* [Internet]. 2009;23(12):1136–44. Available from: <https://doi.org/10.1177/0269215509342329>
31. Park JK, Deutz NEP, Cruthirds CL, Kirschner SK, Park H, Madigan ML, et al. Risk Factors for Postural and Functional Balance Impairment in Patients with Chronic Obstructive Pulmonary Disease. *Journal of Clinical Medicine* [Internet]. 2020;9(2):609. Available from: <https://doi.org/10.3390/jcm9020609>
32. Mkacher W, Tabka Z, Trabelsi Y. Minimal Detectable Change for Balance Measurements in Patients With COPD. *Journal of cardiopulmonary rehabilitation and prevention* [Internet]. 2017;37(3):223–8. Available from: <https://doi.org/10.1097/HCR.0000000000000240>
33. Al Haddad MA, John M, Hussain S, Bolton CE. Role of the Timed Up and Go Test in Patients With Chronic Obstructive Pulmonary Disease. *Journal of Cardiopulmonary Rehabilitation and Prevention* [Internet]. 2016;36(1):49–55. Available from: <https://doi.org/10.1097/hcr.0000000000000143>

34. Singh SS, Bhat A, Mohapatra AK, Manu MK, Vaishali K. Comparison of reaction time and functional balance in chronic obstructive pulmonary disease and healthy participants. *Heart & Lung*[Internet]. 2019; Available from: <https://doi.org/10.1016/j.hrtlng.2019.09.006>
35. Pereira A, Xavier RF, Lopes AC, da Silva C, Oliveira CC, Fernandes FLA, et al. The Mini-Balance Evaluation System Test Can Predict Falls in Clinically Stable Outpatients With COPD: A 12-MO PROSPECTIVE COHORT STUDY. *Journal of Cardiopulmonary Rehabilitation and Prevention* [Internet]. 2019;39(6):391–6. Available from: <https://doi.org/10.1097/HCR.0000000000000427>
36. Harrison SL, Beauchamp MK, Sibley K, Araujo T, Romano J, Goldstein RS, et al. Minimizing the evidence-practice gap - a prospective cohort study incorporating balance training into pulmonary rehabilitation for individuals with chronic obstructive pulmonary disease. *BMC Pulmonary Medicine*[Internet]. 2015;15(1). Available from: <https://doi.org/10.1186/s12890-015-0067-2>
37. Roig M, Eng JJ, MacIntyre DL, Road JD, FitzGerald JM, Burns J, et al. Falls in people with chronic obstructive pulmonary disease: an observational cohort study. *Respiratory medicine* [Internet]. 2011;105(3):461–9. Available from: <https://doi.org/10.1016/j.rmed.2010.08.015>
38. Tudorache E, Oancea C, Avram C, Fira-Mladinescu O, Petrescu L, Timar B. Balance impairment and systemic inflammation in chronic obstructive pulmonary disease. *International Journal of Chronic Obstructive Pulmonary Disease* [Internet]. 2015; 10(1):1847-1852. Available from: <https://doi.org/10.2147/copd.s89814>
39. de Castro LA, Ribeiro LR, Mesquita R, de Carvalho DR, Felcar JM, Merli MF, et al. Static and Functional Balance in Individuals With COPD: Comparison With Healthy Controls and Differences According to Sex and Disease Severity. *Respiratory care* [Internet]. 2016;61(11):1488–96. Available from: <https://doi.org/10.4187/respcare.04749>



Immersive RPG Elderly Health: A New Possibility for Constructing Health Learning?

Aline Rodrigues Reser¹ 
Paula Suseli Silva de Bearzi¹ 
Julio Cesar de Matos² 
Renato José De Marchi³ 
Aline Blaya Martins^{1,3} 

Abstract

Objective: To assess the applicability and effectiveness of a game incorporating Roleplaying Game (RPG) elements as a pedagogical tool for health education. *Method:* The study population comprised undergraduate and postgraduate students in the health field at the Universidade Federal do Rio Grande do Sul, Brazil. This qualitative research was conducted between April and June 2018 in two stages. Initially, the RPG was implemented with the involved classes, followed by Focus Group interviews conducted a week later to gather information, with volunteers from these classes who willingly participated in the research. Information analysis was grounded in aspects of Grounded Theory (GT). *Results:* The analysis yielded the following categories: 1) Game creation, 2) Impact of the experience on teaching and learning, 3) Reflection on the game. The results demonstrate that the use of RPG-influenced games holds significant untapped potential in the health education process. This innovative method remains underutilized within the health domain, necessitating adherence to specific premises for its potent application. *Conclusion:* In this context, it is understood that the game contributes to health education, enhancing knowledge and skills through a challenging and reality-connected experience.

Keywords: Older Adults' Health. Health Education. Universities. Experimental Games. Learning.

¹ Universidade Federal do Rio Grande do Sul, Mestrado no Programa de Saúde Coletiva da UFRGS. Porto Alegre, RS, Brasil.

² Pontifícia Universidade Católica do Rio Grande do Sul. Porto Alegre, RS, Brasil.

³ Universidade Federal do Rio Grande do Sul, Faculdade de Odontologia, Departamento de Odontologia Preventiva e Social da UFRGS. Porto Alegre, RS, Brasil.

There was no funding for the execution of this work.

The authors declare that there is no conflict in the conception of this work.

Correspondence
Aline Rodrigues Reser
japareser@gmail.com

Received: September 14, 2023
Approved: January 08, 2024

INTRODUCTION

Contemplating the university from a complex perspective necessitates breaking away from the hegemony of traditional education marked by specialization and the fragmentation between theory and practice¹. Despite recent advances in teaching, one of the foremost challenges in this domain pertains to constructing effective and interprofessional learning that fosters reflection and attitudinal change. These factors are pivotal in the training of healthcare professionals, constituting a significant hurdle for the implementation and fortification of healthcare attention within the Unified Health System (Sistema Único de Saúde - SUS)².

Certain institutions of higher education have invested in reshaping professional training by implementing the National Curricular Guidelines (Diretrizes Curriculares Nacionais - DCNs) for health courses from 2001, with integrality serving as a guiding axis for education³. The DCNs for health courses signify a significant advancement resulting from collective construction emerging from the Sanitary Reform movement⁴.

Resolution number 569/2017 from the National Health Council reaffirms the constitutional prerogative to regulate the training of healthcare professionals. Notably, clause VII emphasizes the use of teaching methodologies that foster collaborative and meaningful learning, as well as methodologies that prioritize student participation and autonomy, integration across curricular content, and educational proposals grounded in interdisciplinary practices⁵.

Within the Brazilian context, a relevant yet frequently overlooked theme/content in undergraduate health courses pertains to population aging. Given the rapidity of this demographic shift, it brings forth crucial considerations for managers, researchers, and healthcare professionals⁶.

Considering the significance of the information addressed in the National Education Plan (2000) and the Resolution of the National Health Council (2017), it is imperative to develop and implement teaching approaches in line with contemporary needs and realities. Furthermore, assessing their effectiveness as tools for teaching and learning is essential.

Thus, one of these underexplored technologies is the utilization of games with Roleplaying Game (RPG) elements as a tool for health education. Particularly challenging is its directed application to learning associated with the development of empathy towards older individuals and their health issues. Immersive is a role-playing game, with its primary feature being interactivity and collaborative group work. This game was devised by incorporating certain features from a narrative RPG known as Fiasco⁷.

Immersive aims to narrate stories based on everyday scenarios, simulating complex themes and challenging decisions involving the health of the older population. Its objective is to generate a discussion from a participant's empathetic perspective. In this game, participants assume the persona of a character created within the game, complete with relationships and interests. The game unfolds through scenes and dialogues managed by randomly determined constructs employing a pre-established methodology, facilitated by the use of cards and dice to ensure unpredictability. This study aimed to propose and evaluate a game with Roleplaying Game (RPG) elements as a pedagogical tool for health education.

METHOD

This qualitative study used Grounded Theory (GT) method, with a Focus Groups (FG) approach⁸. It is an intervention study, commencing with the implementation of RPG with the involved classes, followed by FG interviews a week later to gather information, involving volunteers from these classes who willingly participated in the research. The study was conducted in two phases between the months of April and June 2018.

Participants in this study were undergraduate and postgraduate students in health-related courses at Federal University of Rio Grande do Sul (UFRGS), specifically those with content/disciplines related to older care/family health in their curricula. Prior contact was established with faculty members from the Dentistry, Public Health, and Speech-Language Pathology courses, wherein the study's objectives were explained.

In the initial phase, the developed activity through the Immersive Elderly Health game was implemented as a pedagogical component of the courses. This cooperative game structure eliminates the presence of winners or losers, with each participant assuming a character in an imaginary adventure within a real physical setting. Participants

take on the persona of a character crafted within the game, complete with relationships and interests. The game encompasses three character types: the healthcare professional, the user, and the older person. It also anticipates the involvement of a minimum of four participants, along with a facilitator.

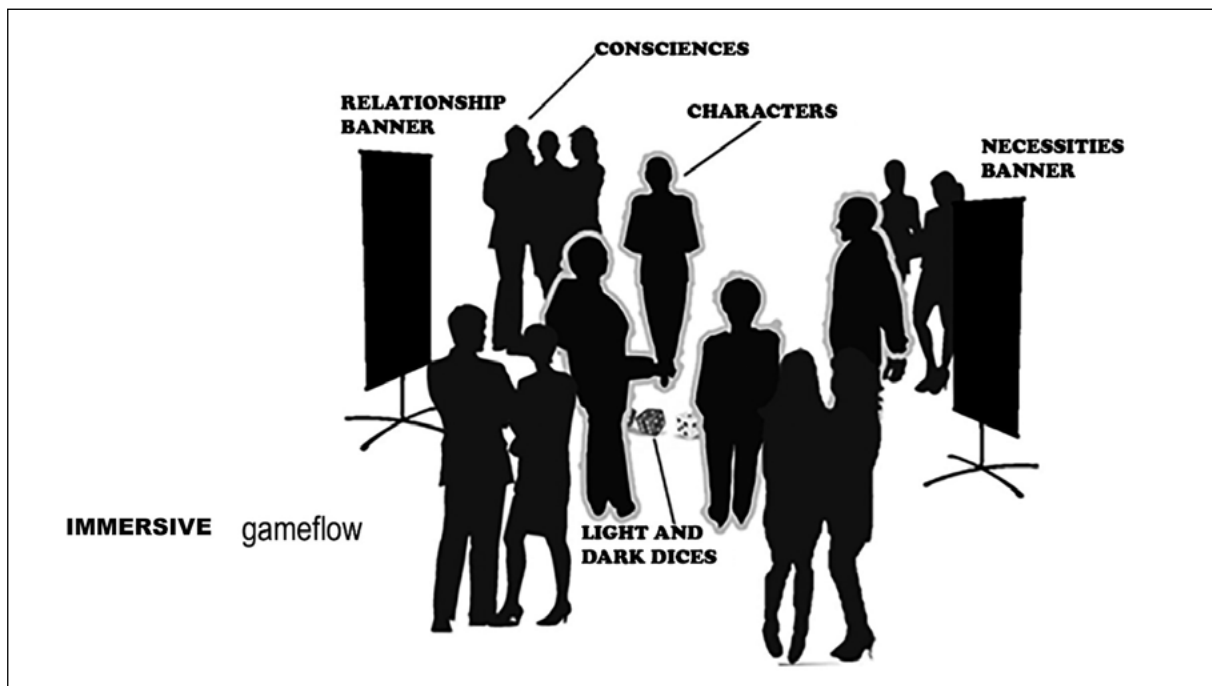


Figure 1. Explanatory Flowchart of the Immersive Elderly Health Game. Porto Alegre, Rio Grande do Sul, 2023. Source: Authors (2023)

There exists a rule system, and the creation of characters and the story occurs randomly through the utilization of six-sided dice (Figure 1). The faces refer to the six physical sides of a die, each inscribed with potential outcomes (commonly known as a six-sided or six-faced die). These faces denote different result possibilities, ranging from one to six. The narratives for each character are shaped when the player simultaneously rolls their four dice. The faces of the dice symbolize the diverse possibilities for constructing outcomes.

The presence of a facilitator is deemed essential to stimulate participants and assist in resolving impasses or conflicts (Table 1). In the second stage, students were invited to partake in a FG conducted one week post-game application.

The FG had a duration ranging from 45 to 60 minutes; the discussions were recorded and stored in digital media. To instigate the discussion in the FG, a semi-structured script was devised. The FG interview was conducted by the researcher in a tranquil environment, allowing enough time for a preamble where participants could articulate their questions regarding the interview, its structure, and content before its commencement. The interview dynamics were mutually agreed upon beforehand between the researcher and the FG. Furthermore, all participants were assured that they could withdraw from the interview at any point without facing discomfort. Confidentiality of information was ensured, guaranteeing that any potential publications derived from this material would not involve the identification of participants.

Table 1. Explanatory Flowchart of the Immersive Elderly Health Game. Porto Alegre, Rio Grande do Sul, 2023.

1 - The facilitator introduces the dynamics and discusses the "Rule of Yes."
2 - Randomly distributes Character Cards to 3 to 5 individuals.
3 - Divides the remaining students into groups for each character. Each group is further divided into 2, and each "side" receives a different Consciousness Card .
4 - Each character takes 4 dice (2 light and 2 dark) and rolls them in the center to generate various random results.
5 - The first player selects a die (result, color does not matter) and chooses a Relationship topic on the Relationship Banner . Selects another character to be their relation. The chosen character picks a new die and details the relationship on the list of possibilities for the chosen topic based on the selected die. The facilitator encourages the creation of the story of the relationship between the characters by asking questions. Repeat until all characters have two relationships with other characters.
6 - The first player chooses a new die (result, color does not matter) and selects a Need topic on the Needs Banner . Chooses another die to detail their need on the list. The facilitator stimulates with questions to create the story of their need and how they will achieve it in the game. Repeat until all characters have detailed their need.
7 - The first player selects another character to create the first scene and draws a Location Card where the scene will take place. He or she initiates the dialogue, attempting to meet their need through the relationships they have with the other character. The consciences of each character involved in the conversation can and should provide ideas and help in the dialogue.
8 - When the facilitator believes the dialogue is well-developed, he/she asks the other consciences, excluding those of the character who initiated the scene, to throw either a light or dark die on the ground. If there are more light dice, the character achieved their need; if more dark, they did not.
9 - Each character takes turns initiating a scene. At the end of this round, everyone takes a break, and the facilitator turns over a Turn Card .
10 - Together, characters and consciences define how the story of their characters concludes, considering the turn.
11 - Once they reach a consensus, the facilitator concludes the activity and can begin the reflection on the scenes and dialogues that occurred.

Source: Authors (2023)

The FG interviews were transcribed in full by the principal researcher (ARR). In addition to information derived from the transcriptions, research diaries and memos, crafted by the principal researcher based on her experiences during the RPG interventions and FGs, were utilized. To facilitate the organization and analysis of information, transcripts were processed using Microsoft Office Word® software and imported into NVIVO® software.

The analysis of information was grounded in aspects of Grounded Theory. Constant comparison, the development of codes for organizing categories, the definition of thematic categories and their relationships, and the formulation of a theory based on evidence generated in the study were employed⁹.

For this study, saturation was determined as the point at which the FG interviews concluded. It

became apparent, through the analysis of the fourth FG, that responses to the interview were becoming repetitive, and both the codes and categories were adequately explained based on the obtained and analyzed information.

DATA AVAILABILITY

The dataset is not publicly accessible due to information that compromises the privacy of the research participants.

RESULTS AND DISCUSSION

The participants in this study comprised 58 students from undergraduate programs (Dentistry - evening program, Speech-language pathology, Public

Health) and postgraduate programs (Integrated Residency in Oral Health) at UFRGS that incorporate older people healthcare into their curricula. The focus groups involved the participation of 38 students (65% of participants). Those students who did not participate cited a lack of time or interest in joining the interview. The focus groups were conducted one week after the game application, as we believed that within this timeframe, students could reflect upon and evaluate the activity.

From the analysis of information and codifications, three analytical categories emerged, underpinning the theory termed "Utilizing the game as a tool."

Playful activities are still underexplored in health education, and the creation and implementation of the game allowed us to perceive how a different tool can stimulate student reflection and participation in the classroom. The results will be presented here, accompanied by excerpts from participant statements to illustrate the evidence provided by the study. The theories that facilitated the analysis of each category will be discussed within the context of the following paragraphs.

Starting to Play

The category **Starting to Play** outlines the development of the activity/pedagogical practice involving the use of "Immersive Elderly Health." The subcategory **Identifying the peculiarities of the game** is expressed through dialogues, wherein students articulate their unfamiliarity with RPG. This observation is evident in comments such as:

"I've heard of it, I've seen it, I've heard of it, I've never played..." (FG_3).

In the 1980s, the first RPGs circulated in Brazil, brought by young students engaged in exchange programs. Although there are specific events that gather thousands of enthusiasts, showcasing practical experiences of its functionalities^{10,11}, RPG remains relatively unexplored and less widespread^{12,13}.

In traditional RPG, the role of the master is indispensable^{12,13}. However, in crafting the tool, we

opted for the role of the facilitator – someone who did not take a stance in the discussion but assisted the group of students in navigating the experience. The following dialogue illustrates the importance of the facilitator:

"I understood well, like [...], as things progressed, someone was explaining well, [...], do this now, [...] this is what happens..." (FG_1).

In RPG games, a system of rules is established to facilitate gameplay. In the proposed game, the basic rules included the "rule of 'yes'," meaning that when a player said something about their character, all other players would accept it as truth in the narrative, without contradiction.

"What complicates the creation of the story the most, creating an unfolding that we never imagine, is the rule of 'yes'" (FG_2).

The rules have the ability to establish the context that will be experienced, imposing limits and possibilities on the players. The settings constructed by the game rules lead to diverse realities that require players to adapt to them^{11,13}.

The **construction of characters** by the students took into consideration the characteristics of real people and examples observed in their everyday lives.

"I really embodied the character, you know? [...] I thought about stories; there are indeed people who go through this [...] I began to imagine all the possibilities of what I had experienced!" (FG_3)

The selection of characters was highly creative and playful. This is a crucial moment, as each student defines characteristics of their characters, fostering a greater sense of identity with the created personas. It is also the most time-consuming and challenging phase, involving the participants' expectations regarding the commencement of the game.

One of the objectives of the game was to expose the students to challenging situations that required decision-making, communication, and teamwork. This exercise is crucial for acquiring competencies and skills advocated in the DCNs for health courses.

The DCNs for health courses advocate for the development of a critical-reflexive professional, a transformative agent of social reality, and committed to public health. However, the curricular contents are often directly linked to the hegemony of the medical-curative care model, guiding professionals towards technician, curative, and less dialogical practices, similar to those triggered during the use of "Immersive." In this context, the game proved to be potent in awakening students to actions that required them to reinterpret content and experiences¹⁵.

According to Prager¹⁶, the story is never complete. It will always transform based on the actions carried out by the players' characters. As was evident:

"It may be that I was the instigator, but I found it interesting because she died, but she spent the whole time saying: so I'm going to kill myself, so I'm going to kill myself, and no one did anything because she was just the annoying old lady who complained and... Damn, she killed herself!" (FG_2).

From the above dialogue, it is evident that the students can make analogies with practice and understand that often behind users' complaints lies a plea for help. In this context, the game "Immersive Elderly Health" can provide the teacher with insights into areas of weakness in training, such as patient care and person-centered approaches.

Any game comprises various mechanisms that serve as tools to guide the player through the experience designed for the game. Through these mechanisms, players make choices to solve micro-problems with the aim of addressing a larger issue¹⁵.

Another relevant aspect was the randomness of the game, prompting participants to make choices and decisions under pressure, as often occurs in life. According to Morin (2011)¹⁷, we tend to position ourselves securely with our theories and ideas and struggle to embrace the new, the unexpected, that continually arises. It is necessary to unite various forms of knowledge that we have access to so that we can comprehend that the future remains unpredictable.

The game was designed for characters to experience difficult choices, demonstrating to the

student that there are no optimal choices, but rather, choices. Decision-making doesn't always fit into protocols; it is influenced by the duality of rational/irrational and objective/subjective elements. There are no correct answers for all the complex situations we encounter¹⁸.

The Impact of the Experience on Teaching and Learning

The impact of the experience on teaching and learning is expressed through dialogues, wherein students convey their surprise at the use of RPG in education and the reflections constructed from the experience.

There is a concern with teaching and learning methodologies as they are not uniform in terms of both theoretical and methodological assumptions. There are various models and strategies for their operationalization, each with different benefits and challenges¹⁹.

Building a professional profile that is free, secure, and cooperative is unattainable within a training program that induces alienation rather than reflection. Involvement in the game's plot allowed the exploration of unpleasant or unfavorable feelings seldom discussed in other situations. Students reflected on the character's situation, the game's outcome, and the importance of analyzing situations from various perspectives before making decisions:

"I think what sticks with us the most is that we spend so much time deciding whether to say yes or no, and in the end, there is no choice left, and the shocking ending" (FG_4).

"We deal with emotions every day, wanting to take actions that, if there were no reason, we would commit atrocities" (FG_3).

It is important to emphasize that content is not neutral; it has political implications²⁰. The role of the educator is to encourage a critical reading of reality; one must recognize the principle of rational uncertainty: "rationality constantly runs the risk, unless it maintains vigilant self-criticism against falling into rationalizing illusion"⁷.

In the subcategory **experiencing situations similar to those observed in everyday life**, it became evident how the intervention was able to stimulate students toward critical thinking. When compared to a traditional lecture, the students made the following statements:

"We are used to it, we are in the 5th year, we are used to sitting and listening to someone lecturing, you know?" (FG_4).

"Suddenly, if a teacher were to present this on a slide, maybe we wouldn't even remember cases like that" (FG_3).

Based on the statements above, it is evident that the traditional teaching model prioritizes the transmission of information; students assume a passive role in receiving theories, and the teacher takes on the primary role. However, it is necessary for educators to explore new teaching methodologies that encourage student protagonism, foster autonomy, motivation, and the exercise of empathy.

The use of the game "Immersive" as a powerful teaching tool can be observed in the ease of recalling certain cases influenced by their complexity or tragic endings, as well as the consequences of players' actions. As evidenced in the statements below:

"And this reflection that we do afterward, it stays with us much more. After I left here, I was reflecting on what happened and situations of people that we know..." (FG_4).

Also noteworthy are the statements of the students regarding their **unpreparedness to handle various situations** encountered in daily life. It is apparent that our society has become increasingly complex in terms of knowledge production. Among other objectives, university education is linked to the exchange of knowledge and a focus on theoretical/practical issues. However, what is observed is a significant difficulty in providing methodologies that foster such discussions and experiences:

"When we arrive, there are situations that we don't know how to handle, and there is no one to teach us, and we have to deal with it and figure out a

way on our own to solve some problem or get out of some situation, you know?" (FG_1).

It is worth noting that one of the fundamental characteristics attributed to the game is the stimulation of **decision-making skills**. Each character has autonomy to make decisions they deem correct or convenient. The decision will depend on the ability to experience the story and the possible solutions envisioned.

"I found all the decisions difficult, even those of my classmates. I put myself in their shoes, if I were to make these decisions" (FG_1).

Furthermore, the stories constructed in each intervention had elements similar to those found in our daily lives. These elements allowed students to **compare the story with real life**.

"[...] We have to have a fictitious experience like we had in the game to then deal with real people. In reality, we can't do anything wrong in the moment" (FG_4).

The construction of the story involved elements such as vulnerability, trafficking, violence, loneliness, addiction, among others. By comparing with real situations, the students had the opportunity to approach situations similar to those experienced in practice.

"I think these experiences make us think about what we will encounter in health services [...]. And we, as healthcare workers, will deal with this sooner or later" (FG_3).

Reflection on the Game

This category addresses the main strengths and weaknesses of the game. It is interconnected with the others and highlights characteristics that make RPG a powerful pedagogical tool for health education.

The subcategory **perceiving the strengths and weaknesses of the game** addresses the perceptions experienced by the students throughout the intervention.

Throughout the interventions, it was observed that the students initially showed surprise and difficulty in understanding, but in no group was there disinterest or discouragement. The majority became **engaged with the story**, as seen in the comment:

"I think it's not easy not to get involved with the story; I saw few people staying out of it!" (FG_2).

One of the initial concerns was whether the intervention would be able to provoke reflection and learning while also being enjoyable. Throughout the activity, it was possible to observe that fun and learning can go hand in hand, as demonstrated below:

"I think I found it more interesting[...] at first, it seemed like just a themed group play, we were going to talk and everything, and then as we went along, we were building the character, you put that reflection of that person in your context, that I found amazing..." (FG_1).

Throughout the focus groups, through the students' statements, **a criticism of the education system** was identified, including the format in which classes are presented and a fear of expressing thoughts and positions.

"Our object of study is people, and we don't have people; we have slides and people lecturing in front of us." (FG_4).

The constant changes in our society have demanded changes in university education. It is necessary for the teacher to be willing to reflect on their practice, problematize it, and seek new knowledge in their field of expertise. Additionally, it is essential to investigate whether other factors may interfere, reducing the student's motivation to attend classes, such as daily fatigue, occasional health problems, pending tasks, and financial condition, among others²¹.

"And to say that we are in a night course[...] we see classes totally dark, the room, people almost sleeping, like... Very difficult..." (FG_2).

Despite all the difficulties, it is crucial for the teacher to use strategies and techniques complementary

to traditional lectures, creating a motivating and stimulating environment. In this regard, the students highlighted the **power of the game** in terms of the possibility of **visualizing various scenarios, practicing, and experiencing theory in practice**, as seen in the following comments.

"It's the issue of praxis; you take all the theory that you've been bringing throughout the course, and here is the moment to apply it! It's in practice that you really..." (FG_3).

Complexity presupposes changes in the education system, based on a disciplinary, fragmented curriculum that values hyper-specialization. It does not provide a holistic view or dialogue between different fields of knowledge. Morin (2011)¹⁷ advocates for a new practice, which is transdisciplinarity. The debate on the relationships woven between disciplines should be constructed around a unified knowledge, guided by a holistic perspective and taking into consideration the aspects of the whole^{18,20}.

It is observed in the highlighted excerpts below that the students approached one of the central skills sought through the game, which was the exercise of **empathy and empathy with older person**.

"The game, I think in this aspect, is a very positive point. It is much easier to be empathetic when we assume a reality or a story, put ourselves into it" (FG_1).

Based on the students' reports, it is evident that the game provided an experience of empathy towards the elderly person. According to Silva et al¹⁸, "Empathy presupposes the ability and, above all, the willingness to understand the other and put oneself in their place."

Regarding learning, it is necessary to reflect on the teaching practice offered in our training institutions: often, we work disconnected from previous experiences, making it meaningless. Reflecting on teaching methodologies in health, two important concepts stand out: autonomy and meaningful learning.

In this sense, it is worth considering that no student is a blank page, especially when thinking about empathy and aging. Empathy should be developed/stimulated from an early age, and aging is intrinsic to human existence; we experience it in our families and social groups.

At the end of the games, a round of conversation was held to conclude the class. Perhaps this was the richest moment of the interventions. It became clear that the interventions deal with the unexpected, unpredictable, and chaotic, as there is no pre-selection of themes but rather a commitment to the story created by the students.

In this context, the game can be seen as an innovative learning tool that stimulates the autonomy of the student and the coexistence with uncertainties, doubts, challenges, and improvisations. The success of the game is centered on dialogue, as each student confronts their values within certain worldviews¹⁹.

Among the limitations of this study, it is necessary to mention that the researcher who applied the game was the same one who conducted the interviews, which could generate bias in the analysis, as well as responses that corroborate with the researchers' expectations. The use of Grounded Theory and Focus Group interviews, due to the sensitivity of the method and the rigor with which they were employed, represents strengths in this study.

CONCLUSION

In this study, it was possible to observe limitations involved in the teaching-learning process about

aging when using traditional teaching methods. The use of the game facilitated the learning process as participants engaged with alterity, developing empathy towards elderly individuals and their health problems by placing themselves in the shoes of the elderly person as the protagonist.

The use of games with RPG elements is a new perspective with important potential in health education. This game is an effective didactic-pedagogical tool, based on experimentation, subjectivity and the capacity for experience of each player. Applications of this tool in practice involve its use in the teaching-learning process for teaching in the area of aging, as well as in other areas of the field of Health.

AUTHORSHIP

- Aline Rodrigues Reser - conception, design, analysis, and interpretation of data; responsible for all aspects of the work.
- Renato José De Marchi - conception and design, critical review, approval to be published.
- Aline Blaya Martins - conception and design, critical review.
- Julio Cesar de Matos - conception, analysis, and interpretation of data.
- Paula Suseli Silva de Bearzi - conception, analysis, and interpretation of data.

Edited by: Marquiony Marques dos Santos







REFERENCES

1. Broch C, Breschiliare FCT, Barbosa-Rinaldi IP. A expansão da educação superior no Brasil: notas sobre os desafios do trabalho docente. *Avaliação Rev da Avaliação da Educ Super*. 2020;25(2):257-274.
2. Prevedello A, Góes F, Cyrino E. Educação interprofissional na formação em saúde no Brasil: uma revisão de escopo. *Rev Bras Educ Med*. 2022;46(3):1-10.
3. Ferreira MJM, Ribeiro KG, Almeida MM, Sousa MS, Ribeiro MTM, Machado MMT, et al. Novas Diretrizes Curriculares Nacionais para os cursos de Medicina: oportunidades para ressignificar a formação. *Interface (Botucatu)*. 2019; 23(Supl. 1):1-15
4. Brasil. Resolução CNE/ CES nº 4, de 07 de Novembro de 2001. Institui diretrizes curriculares nacionais do curso de graduação em medicina. *Diário Oficial da União*. 9 nov 2001.

5. Brasil. Lei 10.172, de 9 de janeiro de 2001. Aprova o Plano Nacional de Educação e dá outras providências. Diário Oficial da União. 10 jan 2001.
6. Rodrigues CC, Todaro MA, Batista CB. Saúde do Idoso: discursos e práticas educativas na formação médica. *Educ em Rev.* 2021;37:1-17.
7. Morningstar J. Fiasco. Chapel Hill: BullyPulpit Games, 2009.
8. Minayo MCS (Org.). Pesquisa Social: teoria, método e criatividade. Revista e atualizada. 25. ed. Petrópolis: Vozes; 2007.
9. Strauss A, Corbin J. Pesquisa qualitativa: técnicas e procedimentos para o desenvolvimento de teoria fundamentada. 2 ed. Porto Alegre: Artmed; 2008.
10. Kurutz YPF, Hülse L, Bonin JC. Folclore em forma de Role-Playing Game: criação de um jogo para utilização na educação infantil. *Rev. Ext. em Foco.* 2023;8(1):131-151.
11. De Sá CD, Paulucci L. Desenvolvimento de um sistema de RPG para o ensino de Física. *Rev Bras Ensino Física.* 2021;43:1-5.
12. Huizinga J. Homo Ludens: o jogo como elemento de cultura. São Paulo: Perspectivas; 2005.
13. Giacomini MP, Pereira NM(org.). Jogos e ensino de história. Porto Alegre: UFRGS, 2018.[acesso em 15 mai 2018]. Available at: <https://lume.ufrgs.br/bitstream/handle/10183/179347/001069221.pdf?sequence=1>
14. Oliveira CA, Amaral EM, Cyrino EG, Gianini RJ. Encontros e desencontros entre projetos pedagógicos de cursos de Medicina e diretrizes curriculares nacionais: percepções de professores. *Interface (Botucatu).* 2021; 25:1-15.
15. Bezerra INM, Nascimento JLdo, Vieira NRS, Silva RPCda, Monteiro VCM, Silvério ZR, et al. A utilização da aprendizagem baseada em problema (ABP) na formação em saúde: um relato de experiência. *Rev Ciência Plur.* 2020;6(1):102-118.
16. Prager RHP. Exploring the Use of Role-playing Games in Education. *Master Teach Res Journal.* 2019;2:1-8.
17. Morin E. Os sete saberes necessários à educação do futuro. 2.ed. São Paulo: Cortez; 2011.
18. Matos J. O Aprender Natural (ou jogos que criam condições de aprendizado)[Medium.com]; 05 nov 2015. 2015.[access on April 15, 2017]. Available at: <https://medium.com/gamefica%C3%A7%C3%A3o-brasil/o-aprender-natural-ou-jogos-que-criam-condi%C3%A7%C3%B5es-de-aprendizado-2b0a5a416c10>
19. Freire P. Pedagogia do Oprimido. 42ed. Rio de Janeiro: Paz e Terra; 2005.
20. Silva JAC da, Massih CGPA, Valente DA, Souza DF de, Monteiro MRLDC, Rodrigues RM. Ensino da empatia em saúde: revisão integrativa. *Rev Bioética.* 2022;30(4):715-24.
21. Maciel JAC. Alunos-trabalhadores do curso noturno de Pedagogia da UFRJ: reflexões sobre suas vivências. Rio de Janeiro. Trabalho de Conclusão de Curso [Licenciatura em Pedagogia] - Faculdade de Educação, Universidade Federal do Rio de Janeiro; 2020.



Analysis of the trend of mortality from external causes in older adults in Brazil, 2000 to 2022

Danilo Erivelton Medeiros Dias¹ 
Alycia Ágata da Silva Costa² 
Kaio Dênnys de Lucena Martins² 
Arthur Alexandrino³ 
Matheus Figueiredo Nogueira⁴ 
Cristiane da Silva Ramos Marinho^{1,2} 

Abstract

Objective: To analyze the trend of mortality due to external causes in older adults in Brazil within the temporal interval spanning from 2000 to 2022 and to identify the sociodemographic profile of mortality. **Method:** Ecological time-series study utilizing secondary data, encompassing mortality in older adults due to external causes in Brazil, spanning the period from 2000 to 2022. The data were collected from the databases of the Department of Informatics of the Unified Health System, population estimates, and census population data provided by the Brazilian Institute of Geography and Statistics. The absolute and relative frequency of the data were analyzed using Microsoft Excel 2010 software. The analysis of trends in mortality rates and segmented linear regression was conducted using Joinpoint, with statistical significance assessed through the Monte Carlo test. **Results:** During the investigated period, 572,608 deaths due to external causes were identified in individuals aged 60 years or older. Regarding the mortality pattern due to external causes in older adults, an increasing trend in mortality rates was observed for the majority of the studied period (2000 to 2013) with an annual percent change (APC) of 1.86 (95% CI: 1.5–2.2). **Conclusion:** The results indicate a growing trend in mortality among older individuals due to external causes, highlighting the need for prioritizing public policies that address this issue.

Keywords: Aged. Mortality. Cause of Death. Central Trend Measures.

¹ Universidade Federal do Rio Grande do Norte, Programa de Pós-Graduação em Saúde Coletiva (PPGSACOL). Santa Cruz, RN, Brasil.

² Universidade Federal do Rio Grande do Norte, Curso de Bacharelado em Enfermagem. Santa Cruz, RN, Brasil.

³ Universidade Federal do Rio Grande do Norte, Programa de Pós-Graduação em Saúde Coletiva (PPGSCOL). Natal, RN, Brasil.

⁴ Universidade Federal de Campina Grande, Unidade Acadêmica de Enfermagem. Cuité, PB, Brasil.

Funding: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) - Brazil - Código de Financiamento 001.

The authors declare that there is no conflict in the conception of this work.

Correspondence
Arthur Alexandrino
alexandrinoarthurdm@gmail.com

Received: August 17, 2023
Approved: November 29, 2023

INTRODUCTION

The progressive increase in the older population should not be construed as a problem; rather, it is an achievement stemming from the processes of development and social advancement. Nevertheless, the physiological frailties and vulnerabilities resulting from the aging process in these individuals often render them victims, predominantly subjected to external causes such as violence and adverse health events. This phenomenon assumes exorbitant proportions in modern society, thus representing a significant public health issue¹.

External causes constitute one of the primary reasons for deaths worldwide, accounting for approximately 10% of global mortality and standing as the third leading cause of mortality among Brazilians from 2002 to 2015². In Brazil, these events rank sixth among the causes of death in older adults, mainly due to injuries and/or trauma resulting from accidents such as pedestrian collisions and falls³.

In this context, external causes, also referred to as accidents and violence, are considered events from the external environment that, through effects stemming from physical, chemical, or radioactive forces, can lead to damages with undesirable health consequences. They are closely associated with physical and neurological disabilities and can even result in the death of individuals when exposed to such events⁴. Linked to this, the aging process, along with diseases, renders this population segment more vulnerable, resulting in a decrease in quality of life, as well as disabilities, and often, mortality³.

In Brazil, between the years 2010 and 2022, 3,239,168 recorded deaths due to external causes in the general population, of which 572,608 were individuals aged 60 or older. Notably, the study of mortality serves as a pertinent indicator for comprehending a society, as it can be considered a social and economic gauge, with the levels reflecting the degree of development within a region or country. Therefore, the execution of the present study is justified by the need to comprehend the patterns of mortality rates due to external causes in older adults and the profile of such deaths in the older adults. This aims to formulate hypotheses regarding

the potential determinants of this mortality over the period, as well as to contemplate strategies that can be employed to mitigate such deaths. Thus, the findings of the study may consequently unveil the demand for specific policies and campaigns targeting at-risk population groups and their prevention^{1,5}.

In light of the foregoing, the objective of this study is to analyze the trend of mortality due to external causes in older adults in Brazil and identify the sociodemographic profile of these deaths within the time frame spanning from 2000 to 2022.

METHOD

This is an ecological time-series study that employed secondary data to investigate mortality in older adults due to external causes in Brazil, covering the period from 2000 to 2022. The unit of analysis encompassed the national territory and its five regions. The study population consisted of individuals aged 60 or older residing in Brazil.

Data collection took place in November 2023 using official public access databases from the Brazilian Ministry of Health, specifically from the Department of Informatics of the Unified Health System (Departamento de Informática do Sistema Único de Saúde - DATASUS), available through the Mortality Information System (Sistema de Informações sobre Mortalidade - SIM). This included preliminary mortality data for the year 2022. Furthermore, estimates of the resident population and census-based population data provided by the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística - IBGE) for census years were also utilized.

External causes were presented according to the International Classification of Diseases, 10th revision (ICD-10), categorized into nine groups: transport accidents (V01-V99), other external causes of accidental injuries (W00-X59), intentionally self-inflicted injuries (X60-X84), assaults (X85-Y09), events with undetermined intent (Y10-Y34), legal interventions and operations of war (Y35-Y36), complications of medical and surgical care (Y40-Y84), sequelae of external causes (Y85-Y89), and supplementary factors related to other causes (Y90-Y98)⁶.

The study had a sample comprising a total of 572,608 deaths due to external causes in older adults. The outcome variable was the mortality rate due to external causes in the older adults. Thus, for the analysis, mortality rates were calculated for the entire set of external causes. This calculation involved dividing the total number of deaths of older adults from all types of external causes during a specific period by the total number of older individuals' residents in that period, multiplied by 100,000. The other independent variables addressed in the study included: types of external causes, gender, age group, race/ethnicity, educational level, marital status, year, and region.

The data were statistically analyzed and presented in the form of tables and a graphical representation (figure), categorized and processed electronically using Microsoft Excel 2010 software. The analyses of trends in mortality rates among older adults due to external causes, spanning from 2000 to 2022, were conducted using the statistical program Joinpoint, version 4.6.0 (<http://surveillance.cancer.gov/joinpoint/>).

For this purpose, estimates of the annual percentage change (APC) were calculated using segmented linear regression (joinpoint regression), identifying potential points of inflection. The analysis considered a 95% Confidence Interval (CI95%) and a significance level of 5% for each detected trend. Statistical significance was assessed using the Monte Carlo permutation test, which adjusts the best-fit line for each segment.

Furthermore, as this study utilized publicly accessible, unrestricted, and non-identifiable data, it was exempt from review by the Research Ethics

Committee, in accordance with Resolution number 510/2016 of the National Health Council.

DATA AVAILABILITY

The entire dataset supporting the results of this study has been made available on the Open Science Framework (OSF) and can be accessed at <https://doi.org/10.17605/OSF.IO/ZWC67>.

RESULTS

During the investigated period, 572,608 deaths due to external causes were identified in older adults. Of these, nearly half, 194,423 (42.9%), were attributable to the group of causes titled "other external causes of accidental injuries" (W00-X59), which includes falls (W00-W19); exposure to inanimate mechanical forces (W20-W49); exposure to animate mechanical forces (W50-W64); accidental drowning and submersion (W65-W74); other accidental threats to breathing (W75/W84); exposure to electric current, radiation, and extreme environmental temperatures and pressures (W85-W99); exposure to smoke, fire, and flames (X00-X09); contact with hot substances or objects (X10-X19); contact with poisonous animals and plants (X20-X29); exposure to forces of nature (X30-X39); accidental poisoning by exposure to harmful substances (X40-X49); excessive exertion, travel, and deprivation (X50-X57); and accidental exposure to other and unspecified factors (X58-X59)⁶.

Regarding the mortality patterns due to external causes in older adults, the findings indicate an increasing trend for the majority of the studied period (2000-2013) (APC=1.86; CI95%: 1.5–2.2), $p < 0.001$.

Table 1. Distribution of the Mortality Rate due to External Causes in Older Adults, Joinpoint Location, and Annual Percentage Change (APC) (n=572,608). Brazil, 2000 to 2022.

Year	Crude Rate	Adjusted Rate	APC Value (CI)	Segment
2000	92.45	92.18	1.86* (1.5 - 2.2)	1
2001	95.11	93.9	1.86* (1.5 - 2.2)	1
2002	95.23	95.64	1.86* (1.5 - 2.2)	1
2003	97.23	97.42	1.86* (1.5 - 2.2)	1
2004	100.36	99.24	1.86* (1.5 - 2.2)	1
2005	101.74	101.09	1.86* (1.5 - 2.2)	1
2006	100.19	102.97	1.86* (1.5 - 2.2)	1
2007	102.32	104.89	1.86* (1.5 - 2.2)	1
2008	107.07	106.84	1.86* (1.5 - 2.2)	1
2009	107.00	108.83	1.86* (1.5 - 2.2)	1
2010	114.70	110.86	1.86* (1.5 - 2.2)	1
2011	114.10	112.92	1.86* (1.5 - 2.2)	1
2012	114.66	115.02	1.86* (1.5 - 2.2)	1
2013	115.85	117.16	<i>Joinpoint 1</i>	1 - 2
2014	117.77	117.39	0.20 (-0.4 – 0.8)	2
2015	117.19	117.62	0.20 (-0.4 – 0.8)	2
2016	119.92	117.85	0.20 (-0.4 – 0.8)	2
2017	120.33	118.08	0.20 (-0.4 – 0.8)	2
2018	119.34	118.31	0.20 (-0.4 – 0.8)	2
2019	118.37	118.55	0.20 (-0.4 – 0.8)	2
2020	110.97	118.78	0.20 (-0.4 – 0.8)	2
2021	118.49	119.01	0.20 (-0.4 – 0.8)	2
2022	124.02	119.24	0.20 (-0.4 – 0.8)	2

APC = Annual Percentage Change; CI = Confidence Interval. *p<0.005, indicating statistical significance. Source: Research data, 2023.

Table 2 presents a specific analysis of the types of external causes of mortality by age group and gender, primary groups of external causes, race/ethnicity, educational level, and marital status. Among the groups of external causes, transport accidents (V01-V99) were identified as the leading cause of mortality in individuals aged 60 to 69 years, totaling 67,004 (32.92%) deaths; and the second leading cause of mortality among individuals aged 70 to 79 years, with 41,631 (25.29%) deaths, predominantly affecting males.

Otherwise, the group composed of other external causes of accidental injuries (W00-X59) was the primary contributor to mortality among individuals aged 70 to 79 years and 80 years or older, claiming the lives of 68,121 (41.39%) and 130,170 (62.20%) older individuals in both age groups, respectively,

with variations in the predominant gender depending on the age range affected.

Regarding race/ethnicity, it can be observed that white and mixed-race older adults combined were the most affected by external causes, accounting for nearly 90% of deaths across all age groups. In the groups of older adults aged 60 to 69 and 70 to 79, a predominance of male mortality, regardless of their race/ethnicity. However, among individuals aged 80 years or older, females were the most affected.

About education, it was observed that over 75% of older adults who died from external causes had a maximum of seven years of education, regardless of age group. Regarding marital status, regardless of age group, the most prominent feature was deaths among married and male older individuals.

Regarding the distribution of the proportionality of deaths in older adults due to external causes in males compared to females, it was observed that the group of causes represented by assaults (X85-Y09) was able to victimize six times more men than

women. Subsequently, self-inflicted intentional injuries (X60-X84) were four times more fatal in men than in women. Nonetheless, complications of medical and surgical care (Y40-Y84) resulted in more deaths among women than men (0.84:1).

Table 2. Distribution of deaths due to external causes, race/ethnicity, education, and marital status of older adults, according to age group and gender (n=572,608). Brazil, 2000 to 2022.

Variables	Age group								
	60 to 69 years old			70 a 79 years old			80 years or older		
	Female	Male	Total	Female	Male	Total	Female	Male	Total
n (%)			n (%)			n (%)			
Types of External Causes									
Traffic Accidents	14394 (7.07)	52601 (25.84)	67004 (32.92)	12093 (7.35)	29533 (17.94)	41631 (25.29)	6024 (2.88)	13019 (6.22)	24321 (11.62)
Other external causes of accidental injuries	14271 (7.01)	42288 (20.78)	56561 (27.79)	29046 (17.65)	39064 (23.73)	68121 (41.39)	79197 (37.84)	50962 (24.35)	130170 (62.20)
Intentional self-harm injuries	4252 (2.09)	16852 (8.28)	21104 (10.37)	2182 (1.33)	9947 (6.04)	12129 (7.37)	846 (0.40)	4569 (2.18)	5416 (2.59)
Assaults	3286 (1.61)	25176 (12.37)	28464 (13.98)	1990 (1.21)	9945 (6.04)	11935 (7.25)	1142 (0.55)	3538 (1.69)	4682 (2.24)
Events of undetermined intent	5776 (2.84)	17660 (8.68)	23440 (11.52)	8937 (5.43)	13098 (7.96)	22036 (13.39)	21380 (10.22)	13127 (6.27)	34512 (16.49)
Legal interventions and military operations	8 (0.00)	46 (0.02)	54 (0.03)	4 (0.00)	29 (0.02)	33 (0.02)	14 (0.01)	21 (0.01)	35 (0.02)
Complications of medical and surgical care	2712 (1.33)	3037 (1.49)	5749 (2.82)	3901 (2.37)	3695 (2.24)	7596 (4.62)	5069 (2.42)	3023 (1.44)	8094 (3.87)
Sequels of external causes	290 (0.14)	875 (0.43)	1166 (0.57)	435 (0.26)	675 (0.41)	1110 (0.67)	1334 (0.64)	721 (0.34)	2055 (0.98)
Total	44989 (22.10)	158535 (77.89)	203542 (100.00)	58588 (35.60)	105986 (64.39)	164591 (100.00)	115006 (54.95)	88980 (42.52)	209285 (100.00)
Race/Ethnicity									
White	25353 (12.43)	79312 (38.88)	104666 (51.31)	36585 (22.23)	59595 (36.21)	96181 (58.44)	79040 (38.74)	55923 (27.41)	134966 (66.16)
Mixed	14902 (7.30)	62558 (30.66)	77463 (37.97)	15921 (9.67)	35337 (21.47)	51263 (31.15)	25204 (12.35)	24178 (11.85)	49385 (24.21)
Black	2575 (1.26)	9197 (4.51)	11772 (5.77)	2848 (1.73)	5383 (3.27)	8231 (5.00)	4461 (2.19)	3656 (1.79)	8118 (3.98)
Unspecified	1984 (0.97)	6521 (3.20)	8519 (4.18)	2572 (1.56)	4443 (2.70)	7024 (4.27)	4874 (2.39)	3841 (1.88)	8732 (4.28)
Asian	295 (0.14)	839 (0.41)	1134 (0.56)	555 (0.34)	983 (0.60)	1540 (0.94)	1260 (0.62)	1203 (0.59)	2464 (1.21)
Indigenous ethnicity	125 (0.06)	327 (0.16)	452 (0.22)	107 (0.07)	245 (0.15)	352 (0.21)	167 (0.08)	179 (0.09)	346 (0.17)
Total	45234 (22.17)	158754 (77.82)	204006 (100.00)	58588 (35.60)	105986 (64.39)	164591 (100.00)	115006 (56.37)	88980 (43.62)	204011 (100.00)

to be continued

Continuation of Table 2

Variables	Age group								
	60 to 69 years old			70 a 79 years old			80 years or older		
	Female	Male	Total	Female	Male	Total	Female	Male	Total
	n (%)			n (%)			n (%)		
Educational level									
No formal education	6030 (4.16)	16728 (11.55)	22759 (15.72)	10396 (8.80)	14498 (12.27)	24895 (21.08)	26372 (17.33)	14755 (9.70)	41129 (27.03)
1 to 3 years	9021 (6.23)	33111 (22.87)	42133 (29.10)	13141 (11.13)	23697 (20.06)	36841 (31.19)	26772 (17.60)	20910 (13.74)	47683 (31.34)
4 to 7 years	9191 (6.35)	34744 (23.99)	43935 (30.34)	11330 (9.59)	21566 (18.26)	32898 (27.85)	19913 (13.09)	16819 (11.06)	36733 (24.14)
8 to 11 years	5811 (4.01)	19814 (13.68)	25626 (17.70)	5448 (4.61)	10637 (9.01)	16085 (13.62)	10049 (6.61)	8174 (5.37)	18226 (11.98)
12 years or more	2715 (1.88)	7629 (5.27)	10344 (7.14)	2473 (2.09)	4920 (4.17)	7393 (6.26)	3603 (2.37)	4765 (3.13)	8368 (5.50)
Total	32768 (22.63)	112026 (77.37)	144797 (100.00)	42788 (36.23)	75318 (63.77)	118112 (100.00)	86709 (56.99)	65423 (43.00)	152139 (100.00)
marital status									
Single	10093 (5.39)	33106 (17.68)	43200 (23.07)	10714 (7.01)	16285 (10.66)	27000 (17.67)	17523 (9.18)	10038 (5.26)	27563 (14.44)
Married	16991 (9.07)	80621 (43.06)	97614 (52.13)	15740 (10.30)	56224 (36.80)	71968 (47.10)	12474 (6.53)	39334 (20.60)	51811 (27.14)
Widower	10302 (5.50)	10903 (5.82)	21205 (11.33)	24539 (16.06)	16157 (10.57)	40698 (26.64)	74518 (39.03)	29061 (15.22)	103584 (54.26)
Legally separated	4185 (2.24)	16579 (8.85)	20765 (11.09)	3531 (2.31)	7684 (5.03)	11215 (7.34)	3064 (1.60)	3414 (1.79)	6478 (3.39)
Other	544 (0.29)	3909 (2.09)	4453 (2.38)	322 (0.21)	1586 (1.04)	1908 (1.25)	337 (0.18)	1131 (0.59)	1468 (0.77)
Total	42115 (22.49)	145118 (77.50)	187237 (100.00)	54846 (35.90)	97936 (64.10)	152789 (100.00)	107916 (56.53)	82978 (43.47)	190904 (100.00)

* The excluded data were disregarded for all age groups. Source: Research data. 2023.

Table 3. Distribution of deaths by gender and proportional mortality of the male population compared to the female population due to external causes in older adults (n= 572,608). Brazil, 2000 to 2022.

Types of External Causes	Male	Female	Proportion
	n (%)	n (%)	Male: Female
Traffic accidents	95153 (16.63)	32511 (5.68)	2.93:1
Other external causes of accidental injuries	132314 (23.13)	122514 (21.42)	1.08:1
Self-inflicted injuries	31368 (5.48)	7280 (1.27)	4.31:1
Assaults	38659 (6.76)	6418 (1.12)	6.02:1
Events with undetermined intent	43885 (7.67)	36093 (6.31)	1.22:1
Legal interventions and military operations	96 (0.02)	26 (0.00)	3.69 :1
Complications of medical and surgical care	9755 (1.71)	11682 (2.04)	0.84:1
Sequels of external causes	2271 (0.40)	2059 (0.36)	1.10:1
Total	353501 (61.79)	218583 (38.21)	1.62:1

Source: Research data. 2023.

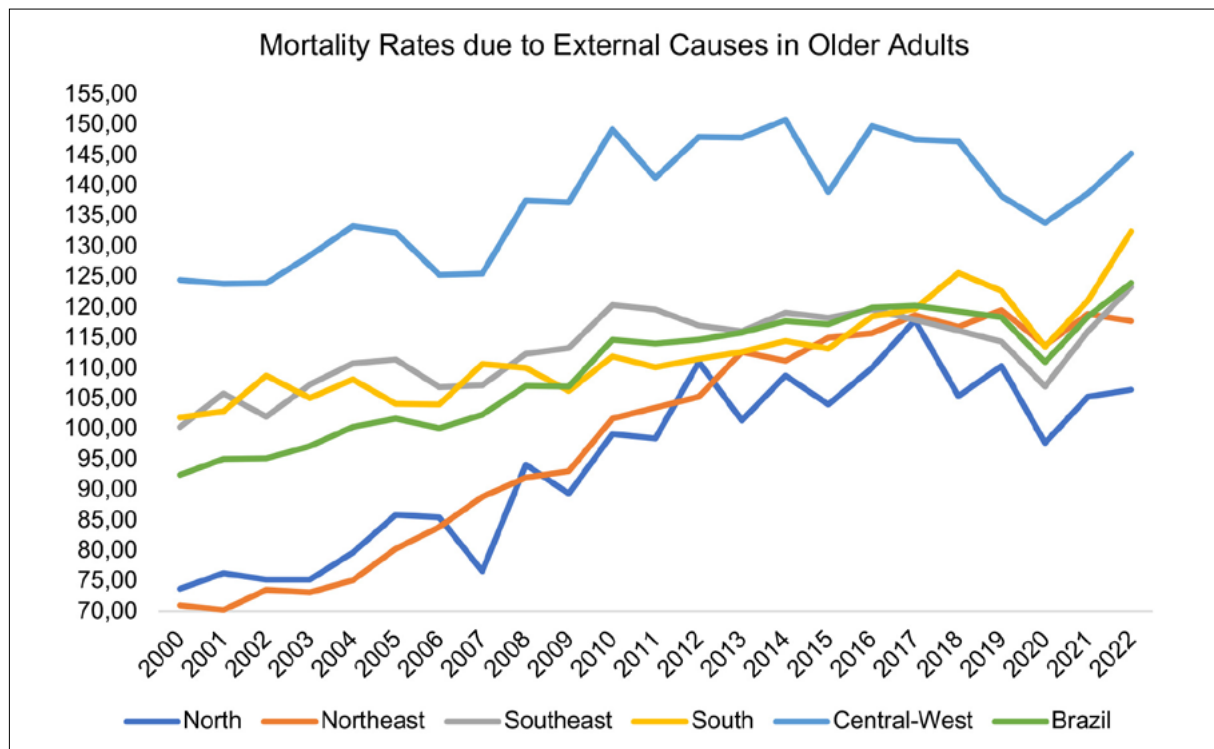


Figure 1. Distribution of mortality rates due to external causes in older adults in Brazil and its regions (n=572,608). Brazil, 2000 to 2022.

According to Figure 1, during the analyzed period, the mortality rate due to external causes in older adults in Brazil varied from 92.45/100,000 inhabitants in 2000 to 124.02/100,000 inhabitants in 2022, corresponding to an Average Annual Percent Change (AAPC) (AAPC=1.2; CI95%: 0.9–1.5) (2000–2022). Concerning the regions of Brazil, all of them showed an increase in their mortality rates due to external causes in older adults, with the central-west region registering the highest rates (AAPC=0.6; CI95%: 0.1–1.1) throughout the years, compared to the national average.

The northern region showed an average percentage increase of 44.39% in its mortality rates due to external causes in older adults during the period. Regarding the northeast region, although it achieved the lowest mortality rate due to external causes in older adults (70.26) in 2011, throughout the time series, it was the region with the highest annual percentage change in the country (APC=3.85; CI95%: 3.5–4.2), thus indicating the highest growth trend in mortality rates due to external causes in older adults compared to other regions of Brazil.

The southeast region exhibited an apparent fluctuating pattern in its mortality rates due to external causes in older adults. However, a real growth trend from 2000 to 2011 (APC: 1.36; CI95%: 0.7–2.0), followed by a non-significant reduction in the subsequent period. Among the Brazilian regions, the South had the lowest annual percentage change during the period (APC=0.89; CI95%: 0.7–1.1). However, for most of the study period, it recorded mortality rates due to external causes in older adults above the national average.

DISCUSSION

This study presented national data on mortality rates due to external causes in older adults, aged 60 years and older, in Brazil, from 2000 to 2022. At this juncture, a temporal analysis of deaths due to external causes was conducted. Based on the findings, an increase in mortality rates due to external causes in the older population was observed until the year 2013, followed by a possible stabilization, with a higher percentage of mortality among males and in the age

group between 60 and 69 years. Traffic accidents, other external causes of accidental injuries, and assaults were the main causes of deaths in this population.

External causes have shown an ascending trend across all age groups in Brazil, particularly in the older population. The increasing trend of mortality due to external causes in this demographic underscore the need for special attention to these types of injuries, given that the aging process tends to contribute to this phenomenon.

The study also revealed that the period from 2000 to 2013 accounted for the highest annual percentage change in mortality rates due to external causes in older adults, representing an average annual growth of APC: 1.86%, with statistical significance. Subsequently (2014 to 2022), the mortality rates due to external causes in older adults exhibited an apparent stability, although the data for this period did not show statistical significance (APC=0.20; CI95%: -0.4–0.8). The increasing proportion of older adults in the population, coupled with social inequalities and low quality of life, places this group of individuals in a vulnerable situation for various causes of death, including external causes.

According to Paiva and Fonseca⁷, in 2019, out of the 1,349,801 deaths recorded in Brazil, approximately 142,800 (10.6%) were due to external causes, making it the 4th leading cause of total deaths. However, some government actions have been implemented. From the year 2000 onwards, with the establishment of policies for the prevention and control of these occurrences, notably the National Policy for the Reduction of Morbimortality from Accidents and Violence (2001), designed primarily to mitigate morbimortality resulting from accidents and violence in the country; and, in the realm of older adults, the inception of the Pact for Life and the National Policy on the Health of Older Adults (2006).

Despite the establishment of these policies, the generated indicators are insufficient to fully reflect the impact on the older adult population. This is due to a fracture in the comprehensiveness of care, underscoring the imperative need for the coordination of care networks, especially those pertaining to health promotion actions and the prevention of ailments⁷.

Concerning gender, it was evidenced that males were the most prevalent in mortality due to external causes among individuals aged 60 to 79 years and 70 to 79 years, affirming that external causes, in addition to affecting young adult males, are also accountable for a considerable number of deaths among older men.

Regarding age group, individuals aged 80 years or older were the most significant victims of external causes, followed by those aged 60 to 69 years, with transport accidents identified as the primary causes responsible for these fatalities. This phenomenon can be explained by the fact that this demographic is more active compared to individuals of higher age, ensuring an active life with improved levels of independence and autonomy, and demonstrating greater social participation, thus potentially being more exposed to accidents and violence⁸.

According to the literature, the mobility of actively engaged older adults contributes to the occurrence of accidents within the urban areas of cities, thereby augmenting the vulnerability of this population to such incidents⁹. Moreover, the aging process, the prevalence of comorbidities, alcohol consumption, traffic dynamics, and structural challenges in spaces frequented by older individuals are risk factors that escalate vulnerability to traffic accidents¹⁰.

Consequently, older individuals classified as pedestrians, in addition to potential limitations arising from functional conditions, coupled with inadequate traffic infrastructure and the adoption of inappropriate behaviors in transit, such as imprudence on the part of car and motorcycle drivers, contribute to the susceptibility of older adults to transportation accidents. Another noteworthy aspect is the behavior of older adults in traffic, particularly during street crossings, wherein certain situations arise without due attention to the use of crosswalks and traffic signals¹⁰.

The group of causes denominated as other external causes of accidental injuries was the most prevalent among older adults due to external factors. It is crucial to emphasize that within this group, falls constituted the second most significant cause of fatalities resulting from external causes in the older population, particularly among individuals aged over

80, with the female demographic in this age bracket experiencing a higher incidence. Such an occurrence is justified by various intrinsic and extrinsic factors, such as polypharmacy, iatrogenic effects, and the decline in functional capacity, which contribute to the occurrence of minor injuries, fractures, cranial traumas, and hip fractures^{8,11}.

In accordance with this, falls among older adults further compromise the aging process, constituting injuries to capabilities, impairing functionality, and predisposing individuals to subsequent episodes of falls. Furthermore, these events stem from the progression of chronological age, a consequence of the effects of age-related changes, pathologies, and the environment in which one resides, wherein, in many situations, adequate accessibility for older individuals is not ensured. A study on the analysis of mortality due to external causes in older adults across Brazilian capitals from 1996 to 2005 revealed that falls accounted for an average of 22.5% of fatalities¹².

Despite not exhibiting a high prevalence in external cause-related deaths among older adults, complications from medical and surgical care were evident as causes of mortality across all age groups of older adults. This underscores the imperative for attention to this type of cause, considering that the various factors inherent to aging already render the older adults more vulnerable, thereby increasing the necessity for surgical procedures, especially in the context of falls. An epidemiological study conducted with older individuals following hip fracture occurrences at a teaching hospital in Rio de Janeiro revealed that out of 167 seniors who experienced falls, 39 sustained hip fractures. These fractures, coupled with chronic illnesses, contributed to a postoperative mortality rate of 8.2%. This event occurred prior to hospital discharge, affecting predominantly the female population, which is more susceptible to falls and, consequently, more prone to experiencing hip fractures with higher prevalence¹³.

About the proportionality of deaths due to external causes between genders, the study identified assaults as the most prominent type of external cause of mortality. A ratio of six men to each woman was observed in deaths caused by assaults among

older individuals. The literature suggests that men more frequently expose themselves to situations involving accidents and violence due to behaviors that reaffirm masculinity, demonstrating greater power and demanding virility and aggressiveness. These behaviors render them more susceptible to premature deaths from preventable causes¹.

It is important to highlight that the increase in the number of older individuals contributes to a rise in issues related to this segment of the population, particularly those associated with aggression by caregivers in both familial and/or institutional settings. This is attributed to heightened financial, social, and psychological dependency. This circumstance results in a series of harms for older adults, encompassing both physical and mental consequences. These effects include psychosomatic illnesses, diminished physical defenses, alterations in activities of daily living, dehydration, changes in appetite patterns, malnutrition, depression, loss of identity, suicide attempts, and even death¹³.

According to a study published in 2018, Latin America was considered the region with the highest mortality rates due to assaults (19.9/100,000 inhabitants), followed by the Caribbean (16.3/100,000), Africa (10.1/100,000), North America (5.6/100,000), Asia (2.1/100,000), Oceania (1.3/100,000), and Europe (1.2/100,000). According to the authors, the high mortality rates due to assaults in Brazilian regions are concentrated in the North, Northeast, and Midwest. However, the association between assaults and high mortality rates in older individuals may be related to pronounced social inequalities, low levels of education, among other factors¹.

Another group of externally caused mortality with gender-relevant significance was represented by intentionally self-inflicted injuries, with a ratio of four men to one woman. The literature suggests that this occurrence stems from the aging process, wherein many men, upon aging, retire from professional life. This transition marks a new phase of life with the cessation of the traditional roles of economic provider and familial reference, leading to social repression. Consequently, a heightened risk of isolation, sadness, stress, and a desire to end one's

life. The situation of social isolation and loneliness becomes a risk factor for suicide^{14,15}.

Regarding the distribution of mortality rates due to external causes in older individuals across regions of Brazil (2000–2022), the study observed an overall upward trend in deaths throughout the examined period and across all regions. However, mortality rates in the South, Southeast, and Midwest regions stood out as the highest in comparison to the country's average rate.

Nonetheless, in some areas such as the North region, a pronounced underreporting regarding the registration of the cause of death due to external causes, often being confused with other reasons, particularly complications and hospital infections. Additionally, a scarcity of healthcare services offered to the older population, with a weakening of public policies due to various factors, primarily those related to mismanagement¹⁶.

In the Brazilian national scenario, a noteworthy upward trend across all regions, with particular emphasis on the North and Northeast, where a significant variation was observed. Conforming to Carmo et al.⁸ (2017), this regional difference is likely a result of local cultural and socioeconomic disparities, as the literature highlights a higher occurrence of accidents and violence among those less privileged individuals with low educational levels living in precarious conditions. Nevertheless, the South and Southeast regions exhibit lower rates of illiteracy and social inequalities. Additionally, most municipalities with good human development in Brazil are concentrated in these regions.

Thus, the need for effective implementation of policies and programs directed towards the health of the older population is glaring. Among these initiatives is the National Health Policy for Older Adults, which, within the context of external causes, emphasizes the importance of undertaking preventive actions for accidents, violence, and avoidable factors.

A limitation of this study is the use of secondary data extracted from DATASUS, which may contain some underreported information. Nevertheless, the provided information is representative for Brazil, conferring external validity to the research.

CONCLUSION

In evaluating the situation of mortality due to external causes, in all its multiple aspects and within the temporal scope of this study, it was evidenced from the results a trend of increasing mortality among older individuals due to external causes.

Among the highlighted causes, traffic accidents, other external causes of accidental injuries, and assaults stood out. Concerning age group, a greater predominance among individuals aged 60 to 69 years. The male gender was more affected among the causes, reaffirming gender as a risk factor for mortality among older individuals.

The findings of this research underscore the urgent need for the development of additional public health, safety, and social policies for the older population, as well as the reinforcement of existing policies. The older population deserves attention and care from society.

Thus, it is suggested that further studies be conducted on this topic to contribute to the refinement of public policies aimed at prevention and, consequently, the reduction of mortality rates influenced by external causes, which can and should be prevented. Alternatively, this study provides an overview of the current epidemiological situation regarding mortality due to external causes in older individuals.

AUTHORSHIP

- Danilo E. M. Dias - conception and design or analysis and interpretation of data, drafting the paper or critically revising it, approval of the version to be published.
- Alycia Á. S. Costa: drafting of the paper or critical revision.
- Kaio D. L. Martins: drafting of the paper or critical revision.
- Arthur Alexandrino: drafting of the paper or critical revision.

- Matheus F. Nogueira: drafting of the paper or critical revision, approval of the version to be published.
- Cristiane S. R. Marinho: conception and design or analysis and interpretation of data, drafting of

the paper or its critical revision, approval of the version to be published, and responsibility for all aspects of the work, ensuring issues related to accuracy or integrity of any part of the work.

Edited by: Marquiony Marques dos Santos

11 of 11

REFERENCES

- Machado DR, Tavares RE, Tavares FG. Epidemiologia da mortalidade por agressões em idosos. *Rev enferm UFPE on line*. 2018;12(11):3015-23. Available at: <https://doi.org/10.5205/1981-8963-v12i11a237176p3015-3014-2018>
- Cardoso S, Gaertner MHCN, Haritsch L, Henning E, Kropiwek MV, Franco SC. Perfil e evolução da mortalidade por causas externas em Joinville (SC), 2003 a 2016. *Cad Saúde Colet*. 2020;28(2):189-200. Available at: <https://doi.org/10.1590/1414-462X202028020115>
- Santos ACPO, Silva CA, Carvalho LS, Menezes MR. A construção da violência contra idosos. *Rev Bras Geriatr Gerontol*. 2007;10(1):115-27. Available at: <https://doi.org/10.1590/1809-9823.2007.10019>
- Preis LC, Lessa G, Tourinho FSV, Santos JLG. Epidemiologia da mortalidade por causas externas no período de 2004 a 2013. *Rev enferm UFPE on line*. 2018;12(3):716-28. Available at: <https://doi.org/10.5205/1981-8963-v12i3a230886p716-728-2018>
- Política Nacional de Redução da Morbimortalidade por Acidentes e Violência. *Rev Saúde Pública*. 2000;34(4):427-30. Available at: <https://doi.org/10.1590/S0034-89102000000400020>
- Monteiro YCM, Vieira MAS, Vitorino PVO, Queiroz SJ, Policena GM, Souza ACS. Trend of fall-related mortality among the elderly. *Rev Esc Enferm USP*. 2021;55:e20200069. Available at: <https://doi.org/10.1590/1980-220X-REEUSP-2020-0069>
- Paiva IL, Fonseca MRCC. Mortalidade por causas externas no estado de São Paulo: Uma análise epidemiológica do período de 2000 a 2018. *Research, Society and Development*. 2021;10(9):e15101018627. Available at: <https://doi.org/10.33448/rsd-v10i10.18627>
- Carmo EA, Souza TS, Nery AA, Vilela ABA, Martins Filho IE. Trend of mortality from external causes in elderly. *J Nurs UFPE on line*. 2017;11(Suppl.1):374-82. Available at: <https://doi.org/10.5205/1981-8963-v11i1a11918p374-382-2017>
- Duarte MB, Santos ABBV, Sobral FCM. Mortalidade por acidentes de trânsito em idosos nas regiões do Brasil no período de 2009 a 2018. *Práticas e Cuidado: Revista de Saúde Coletiva*. 2021;2(e10392):1-13. Available at: <https://www.revistas.uneb.br/index.php/saudecoletiva/article/view/10392/7525>
- Furtado BMASM, Lima ACB, Ferreira RCG. Acidentes de transporte terrestre envolvendo pessoas idosas: revisão integrativa. *Rev Bras Geriatr Gerontol*. 2019;22(3):e190053. Available at: <http://dx.doi.org/10.1590/1981-22562019022.190053>
- Meirelles Junior RC, Castro JO, Faria L, Silva CLA, Alves WA. Notificações de óbitos por causas externas e violência contra idosos: uma realidade velada. *Rev Bras Promoç Saúde*. 2019;32:8685. Available at: <https://doi.org/10.5020/18061230.2019.8685>
- Antes DL, Schneider IJC, d'Orsi E. Mortality caused by accidental falls among the elderly: a time series analysis. *Rev. Bras. Geriatr. Gerontol*. 2015;18(4):769-78. Available at: <http://dx.doi.org/10.1590/1809-9823.2015.14202>
- Souza CS, Bandeira LLB, Napolini MM, Aguiar MC, Marcolla V, Souza Neto JD. Análise das taxas de internação e de mortalidade por agressão em pacientes com mais de 60 anos. *Rev Soc Bras Clin Med*. 2018;16(2):89-93. Available at: <https://docs.bvsalud.org/biblioref/2018/09/913365/16289-93.pdf>
- Santos EGO, Oliveira YOMC, Azevedo UN, Nunes ADS, Amador AE, Barbosa IR. Spatial temporal analysis of mortality by suicide among the elderly in Brazil. *Rev Bras Geriatr Gerontol*. 2017;20(6):845-55. Available at: <http://dx.doi.org/10.1590/1981-22562017020.170115>
- Ribeiro TS, Ramalho AA, Vasconcelos SP, Opitz SP, Koifman RJ. Tendência temporal da mortalidade em idosos em municípios no estado do Acre. *Rev Bras Geriatr Gerontol*. 2020;23(3):e200018. Available at: <http://dx.doi.org/10.1590/1981-22562020023.200018>
- Fixina EB. O comportamento das mortes por causas externas, no Brasil [tese]. Natal: Universidade Federal do Rio Grande do Norte, Programa de Pós-Graduação em Ciência da Saúde. 2015 [Accessed May 12, 2023]. Available at: <https://repositorio.ufrn.br/handle/123456789/27729>



Polypharmacy, potentially inappropriate medications, and the vulnerability of older adults

Raquel Coelho de Andrade¹ Maíra Mendes dos Santos² Euler Esteves Ribeiro² James Dean Oliveira dos Santos Júnior³ Hércules Lázaro Morais Campos⁴ Elisa Brosina de Leon⁵

Abstract

Objective: To analyze the frequency of polypharmacy and the prescription of Potentially Inappropriate Medications (PIM) according to the Beers Criteria and CBMPI in older adults with clinical-functional vulnerability. **Method:** This is a cross-sectional study where the medical records of 496 participants aged 60 and older, seen in their first appointment at a Gerontological Polyclinic, were analyzed. Sociodemographic data, medications, the Clinical-Functional Vulnerability Index-20 (IVCF-20), and falls were extracted from the medical records. Polypharmacy was defined as the simultaneous use of five or more medications. Participants were classified into three groups: robust, at risk, and vulnerable. **Results:** The analysis revealed that 69 (13.91%) participants were using polypharmacy. Among polypharmacy users, 40 (57.97%) were using at least one PIM. The most commonly found PIM were glibenclamide and omeprazole, respectively. Older adults with vulnerability were three times more likely to have polypharmacy (OR 3.59; 95% CI 2.109-6.092). **Conclusion:** The use of polypharmacy and PIM in this study was associated with the vulnerability of older adults, emphasizing the need for a thorough evaluation of medication prescriptions for this population.

Keywords: Polypharmacy. Potentially Inappropriate Medications. Vulnerability. Older Adults.

¹ Universidade Federal do Amazonas (UFAM), Faculdade de Educação Física e Fisioterapia (FEFF). Manaus, AM, Brasil.

² Fundação Universidade Aberta da Terceira Idade (FUnATI). Manaus, AM, Brasil.

³ Universidade Federal do Amazonas (UFAM), Instituto de Ciências Exatas, Departamento de Estatística. Manaus, AM, Brasil.

⁴ Universidade Federal do Amazonas (UFAM), Instituto de Saúde e Biotecnologia (ISB). Coari, AM, Brasil.

⁵ Universidade Federal do Amazonas (UFAM), Faculdade de Educação Física e Fisioterapia, Programa de Pós-graduação em Ciências do Movimento Humano (PPGiMH). Manaus, AM, Brasil.

Funding: This paper was financially supported by the Programa de Iniciação Científica (PIBIC 2021-2022) of the Fundação de Amparo à Pesquisa do Amazonas (FAPEAM) and the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) Programa 001.

The authors declare that there is no conflict in the conception of this work

Correspondence
Elisa Brosina de Leon
elisadleon@ufam.edu.br

Received: August 10, 2023
Approved: January 10, 2024

INTRODUCTION

Longevity is a reality in the global population, and demographic changes resulting from a decrease in fertility rates, an increase in life expectancy, as well as advancements in diagnostic techniques, are precursors to the rise in population aging¹. Although the words "illness" and "aging" are not synonymous, the growth of older population implies an increased prevalence of chronic diseases, necessitating a greater demand for healthcare assistance and elevating the likelihood of medication prescriptions^{2,3}.

Polypharmacy is defined as the simultaneous use of five or more medications, stemming from multiple comorbidities, consultations with different medical specialties, self-medication, and primarily the use of medications beyond those recommended in clinical care⁴. Polypharmacy increases the risk of consuming Potentially Inappropriate Medications (PIM)⁵.

PIM are defined as drugs for which the probability of causing adverse effects is greater than that of providing health benefits. If used over an extended period and in excess, they can lead to pharmacological interactions, resulting in health impairments such as physical dysfunction, intoxications⁶, hospitalizations⁷, dementia⁸, renal insufficiency⁹ and the frailty of older adults¹⁰.

Frailty is associated with the aging process and represents the degree of vulnerability of older adults to situations such as functional deficits, falls, fractures, hospitalizations, and even mortality¹¹. Frailty has multifactorial causes that result in a reduction in resistance and muscle strength, leading to a state of physical, psychological, and social decline in older adults. This condition directly impacts the autonomy and functionality of the individual, increasing the risk of adverse outcomes. Older adults who use polypharmacy associated with PIM may exacerbate or develop greater clinical-functional vulnerability¹².

In 2012, the American Geriatrics Society (AGS) developed a list of Potentially Inappropriate Medications (PIM) that should be avoided, known as the Beers Criteria, which was updated in March 2023¹³. This list is based on a consensus among professionals in the fields of geriatric care, clinical pharmacology, and psychopharmacology, aiming to

enhance the quality of prescriptions by identifying high-risk medications that should be generally avoided and under specific conditions^{13,14}. The Beers Criteria 2012 were validated and served as the basis for the elaboration of the 2016 Brazilian Consensus of Potentially Inappropriate Medications (CBMPI)¹⁵. These national criteria classify PIM for older population, directing medication therapies and minimizing the risks of harmful adverse reactions for the Brazilian population.

Due to the health risks and impact on quality of life arising from the simultaneous use of medications, studies are necessary to investigate the association between polypharmacy and vulnerability in order to promote a risk-benefit analysis of usage, as well as the prescription of potentially inappropriate medications. The use of substances with greater safety helps avoid potential risks associated with PIM, thereby aiming to maintain functionality^{16,17}.

This study aimed to analyze the frequency of polypharmacy and the prescription of potentially inappropriate medications according to the Beers Criteria and CBMPI in older adults with clinical-functional vulnerability.

METHOD

This is a cross-sectional study. The medical records of individuals attended at the Gerontological Polyclinic of the Open University of the Third Age Foundation (FUnATI) in the city of Manaus, Amazonas, were accessed and analyzed. FUnATI is an institution that focuses on education, research, and assistance for older adults. It also offers courses and workshops for the elderly, trains professionals, and provides care through its own Gerontological Polyclinic¹⁸.

The sample was formed by convenience, and the completion of the medical records was carried out by the health team at FUnATI, consisting of nurses, during the participants' first consultation at the service. The medical records of individuals from the public healthcare system of both genders, aged 60 years or older, who sought care at the service (spontaneous demand) from January 2017 to December 2019, were included. Participants with

medical records containing incomplete information were excluded from the study.

The following data were collected from the medical records: gender (male/female), age (60 to 70 years/>70 years), and associated comorbidities. The medications collected from each medical record were those prescribed and used prior to the consultation at the polyclinic¹⁹.

Vulnerability was assessed using the Clinical-Functional Vulnerability Index-20 (IVCF-20). The IVCF-20 is a reliable multidimensional assessment tool for evaluating the functionalities of older adults. This instrument covers questions related to age range, self-perception of health, activities of daily living, cognition, mood, mobility, communication, and multiple comorbidities. The questionnaire aims to identify the level of vulnerability in older adults, with a maximum score of 40 points. The scoring allows classification into three categories: robust, scoring 0 to 6 points; at risk of frailty if scoring 7 to 14 points; or vulnerable if scoring 15 or more points²⁰.

The presence of falls was assessed by the IVCF-20 question, "Have you had two or more falls in the last year?", allowing the creation of the Falls variable (yes/no).

Polypharmacy was characterized as the simultaneous use of five or more medications⁴. The Beers Criteria (Version 2023) and CBMPI (Version 2016) were employed to identify the presence and quantity of Potentially Inappropriate Medications (PIM) in the prescribed medications^{13,15}. The use of PIM was considered when the medication was listed in either the AGS Beers 2023 or CBMPI 2016 criteria. The prescribed medications in the database were classified into therapeutic class and anatomical class according to the Anatomical Therapeutic Chemical (ATC) classification system for a better definition of their effects. The quantity of medications was analyzed to identify the presence or absence of polypharmacy, defined as the concomitant use of

five or more medications by older adults^{21,22}.

The frequency results were presented as percentages and analyzed using the chi-square test, considering a significant p-value < 0.05. The mean age among the groups was analyzed using a one-way Anova test, followed by the Tukey test.

The prevalence ratio (PR) was determined by the ratio between older adults with a prescription for polypharmacy and the total number of participants, with a 95% confidence interval²³.

The study was approved by the Research Ethics Committee of the Universidade Federal do Amazonas under the number 3,781,478.

DATA AVAILABILITY

The dataset is not publicly available due to containing information that compromises the privacy of the research participants.

RESULTS

Among the 496 participants, 344 (69.3%) were women, with an average age of 69 ± 76.8 years. Table 1 presents the sociodemographic characteristics of the participants. Hypertension was the most prevalent comorbidity among the participants (59.87%; n=297). Falls were more common among men compared to women (19.73%; n=30 versus 13.95%; n=48). The majority of participants were classified as robust (44.75%; n=222), followed by at risk of vulnerability (32.05%; n=159) and vulnerable (23.18%; n=115). The analysis revealed that 13.91% of older adults were using polypharmacy.

Table 2 presents the classification and frequency of the 298 prescribed medications. Gastrointestinal tract-acting medications (25.8%; n=77) and those affecting the nervous system (23.15%; n=69) were the most prevalent among older adults.

Table 1. Sociodemographic Characteristics of Participants, Polypharmacy, and Falls (n=496). Manaus, AM, Amazonas, 2019.

Variables	Women n(%)	Men n(%)	Total n(%)
Sex	344(69.35)	152(30.64)	496(100)
Age			
60 to 70 years	236(68.60)	99(65.13)	335(67.54)
>70 years	108(31.39)	53(34.86)	161(32.45)
Comorbidities			
Hypertension	214(62.20)	83(54.60)	297(59.87)
Diabetes Mellitus	87(25.29)	49(32.23)	136(27.41)
Arthritis	84(24.41)	22(14.47)	106(21.37)
Urinary incontinence	84(24.41)	20(13.15)	104(20.96)
Other	77(22.38)	109(71.71)	186(37.50)
Falls			
Yes	48(13.95)	30(19.73)	78(15.72)
No	296(86.04)	122(80.26)	418(84.27)
Vulnerability			
Robust	157(45.63)	65(42.76)	222(44.75)
At risk of vulnerability	110(31.97)	49(32.23)	159(32.05)
Vulnerable	77(22.38)	38(25.00)	115(23.18)
Polypharmacy	48(13.95)	21(13.81)	69(13.91)

Table 2. Classification and Frequency of Prescribed Medications. Manaus, AM, Amazonas, 2019.

Anatomical Group	n(%)
Gastrointestinal tract and metabolism	77(25.83)
Nervous system	69(23.15)
Cardiovascular system	55(18.45)
Musculoskeletal system	38(12.75)
Blood and hematopoietic organs	19(6.37)
Anti-infectives for systemic use	9(3.02)
Systemic hormones (excluding sex hormones and insulins)	8(2.68)
Genitourinary System and Sex Hormones	8(2.68)
Respiratory system	7(2.34)
Antineoplastic Agents and Immunomodulating	4(1.34)
Organs of Senses	3(1.00)
Dermatological	1(0.33)
Total	298(100)

As shown in Table 3, vulnerable older adults presented a more advanced age (71.10 ± 7.35 years; $p < 0.001$) compared to participants at risk of vulnerability (66.50 ± 5.62) and robust individuals (67.03 ± 5.65). The variable "falls" was more frequent in the at-risk group (41%; $n=32$) and the vulnerable group (42.3%; $n=33$) compared to the robust group (16.67%; $n=13$).

Among older adults not using polypharmacy, approximately 214 (50%) belonged to the robust group. In contrast, 46.5% ($n=32$) of vulnerable individuals were using polypharmacy. In the polypharmacy group,

40 (57.97%) had at least 1 potentially inappropriate medication in their medical records. Of these, more than half 25 (62.5%; $n=25$) of the participants were vulnerable older adults ($p < 0.001$). Older adults with vulnerability had a 3.59 times higher risk of having polypharmacy (PR 3.59; 95% CI 2.109-6.092).

Within the group of older adults with polypharmacy, the analysis revealed 27 medications potentially inappropriate according to the Beers and/or CBMPI criteria, which are listed in Table 4. The most frequently encountered PIM was glibenclamide, followed by omeprazole and carvedilol.

Table 3. Association of Vulnerability with Potentially Inappropriate Medications and Falls. Manaus, AM, Amazonas, 2019.

Variable	Robust (n=222)	At risk (n=159)	Vulnerable (n=115)	Total(%) (n=496)	<i>p</i>
Sex					
Women	157(45.63)	110(31.97)	77(22.38)	344(69.35)	0.77
Men	65(42.76)	49(32.23)	38(25.00)	152(30.64)	
Age (mean \pm SD)	67.03 \pm 5.65*	66.50 \pm 5.62*	71.10 \pm 7.35	71.10 \pm 6.20	<0.0001
Falls (%)					
Yes	13(16.67)	32(41.02)	33(42.31)	78(15.72)	<0.0001
No	209(50.00)	127(30.38)	82(19.62)	418(84.27)	
Polypharmacy (%)					
No	214(50.11)	130(30.44)	83(19.43)	427(86.08)	<0.0001
Yes	8(11.59)	29(42.03)	32(46.38)	69(13.91)	
Polypharmacy with at least 1 PIM (%)					
No	2(6.90)	19(65.52)	8(27.58)	29(42.03)	0.0027
Yes	6(15.00)	10(25.00)	25(62.50)	40(57.97)	

Frequencies were analyzed using the chi-square test. The mean age between groups was analyzed using a one-way ANOVA, followed by the Tukey test. A p-value less than 0.05 was considered significant. *versus vulnerable, considering a significant p-value < 0.05.

Table 4. Presentation and classification according to the Beers 2023 and CBMPI 2016 criteria of each Potentially Inappropriate Medication prescribed for the participants. Manaus, AM, Amazonas, 2019.

Name	n	Therapeutic Group According to ATC	Criteria
Glibenclamide (sulfonylureas)	12	Digestive Tract and Metabolism	CBMPI/BEERS
Omeprazole	8	Gastrointestinal Tract and Metabolism	CBMPI/BEERS Recommendation: Avoid scheduled use for >8 weeks
Carvedilol	8	Cardiovascular System	CBMPI In conditions of Chronic Obstructive Pulmonary Disease
Furosemide	5	Cardiovascular system	CBMPI
Ranitidine	5	Gastrointestinal Tract and Metabolism	CBMPI/BEERS In clinical condition of Delirium
Pantoprazole	3	Gastrointestinal Tract and Metabolism	CBMPI
Nifedipine	3	Gastrointestinal Tract and Metabolism	CBMPI/BEERS
Aspirine	2	Blood and Hematopoietic Organs	CBMPI/BEERS In conditions of bleeding disorders
Sertraline	2	Nervous System	CBMPI
Prednisone	2	Systemic Hormones	CBMPI
Ibuprofen	2	Musculoskeletal System	CBMPI/BEERS In conditions of chronic kidney disease
Quetiapine	2	Nervous System	CBMPI In conditions of a history of falls
Fluoxetine	2	Nervous System	CBMPI In conditions of a history of falls
Enoxaparin	1	Blood and Hematopoietic Organs	BEERS In dosages >30ml
Meloxicam	1	Musculoskeletal System	CBMPI/BEERS In conditions of peptic ulcer
Pregabalin	1	Nervous System	CBMPI/BEERS In conditions of a history of falls
Citalopram	1	Nervous System	CBMPI In conditions of a history of falls
Escitalopram	1	Nervous System	CBMPI In conditions of a history of falls
Amitriptyline	1	Nervous System	CBMPI/BEERS In conditions of a history of falls
Gabapentin	1	Nervous System	CBMPI/BEERS
Hydralazine	1	Blood and Hematopoietic Organs	CBMPI In conditions of postural hypertension
Spirolactone	1	Cardiovascular System	CBMPI/BEERS
Digoxin	1	Cardiovascular System	CBMPI/BEERS
Allopurinol	1	Blood and Hematopoietic Organs	CBMPI
Aceclofenac	1	Musculoskeletal System	CBMPI In conditions of chronic kidney disease
Nimesulide	1	Musculoskeletal System	CBMPI In conditions of chronic kidney disease
Diclofenac	1	Musculoskeletal System	CBMPI/BEERS In conditions of chronic kidney disease

ATC: Anatomical Therapeutic Chemical Classification; CBMPI: Brazilian Consensus on Potentially Inappropriate Medications.

DISCUSSION

This study aimed to analyze the frequency of polypharmacy and the prescription of potentially inappropriate medications in older adults with clinical-functional vulnerability. Polypharmacy was found in 46.5% of individuals with vulnerability. Furthermore, individuals with polypharmacy exhibited a higher frequency of at least one potentially inappropriate medication prescribed.

The aging process predisposes individuals to higher risks of comorbidities, functional decline, and health conditions, increasing the likelihood of multiple medication prescriptions in an attempt to maintain quality of life and life expectancy^{2,3}. Medications are necessary therapeutic resources, and when prescribed correctly, they help maintain the quality of life of older adults and control chronic illnesses. However, the assessment of risk/benefit is always essential.

In this study, more than half of the older adults using polypharmacy had at least one PIM. In a retrospective chart analysis study (n=406) of older adults receiving care in the secondary care setting of a Reference Center for Elderly Health Care, it was found that 66.8% of participants had at least one PIM in the presence of polypharmacy²⁰. According to Neves et al.⁹, who assessed individuals above 60 years old hospitalized (n=187), a similar percentage of 66.7% of participants with polypharmacy and PIM was observed. In both studies, the drug omeprazole was among the most prevalent. This result was consistent with the present study, where omeprazole was the second most prescribed.

Also, polypharmacy and the use of PIM were associated with higher levels of vulnerability. In a cross-sectional study conducted with an older population residing in urban areas in Minas Gerais, it was found that 51% of vulnerable older adults used at least one PIM, and 33% of participants classified as at risk of vulnerability used some PIM²². Furthermore, in a study conducted with an institutionalized older population in a geriatric residence in Spain, polypharmacy with PIM was prevalent in 92% of vulnerable individuals¹⁰. These results suggest that the higher the consumption of

PIM, the higher the prevalence of vulnerability and the risk of vulnerability in older adults.

Older adults at risk of frailty were 5 times more likely to use polypharmacy compared to robust participants. This risk increased to 7 times in vulnerable older adults. Similar results were found by Spekalski et al.²⁴ among individuals aged 60 to 85, residing in rural areas of Paraná. Potentially vulnerable or frail individuals had 3 times (3.73) more chances of using polypharmacy when compared to non-vulnerable ones²⁴.

The previously mentioned finding can be explained by the physiological changes of senescence that result in irregular drug absorption. Consequently, modifications in pharmacodynamics and pharmacokinetics related to the simultaneous use of medications potentiate harmful drug interactions that directly affect the functionality of older adults⁵. Functional impairment and the presence of multiple chronic diseases lead to an increasingly complex drug treatment for the elderly, making them even more vulnerable to harmful drug interactions that alter systemic body metabolism, contributing to increased functional decline, decreased muscle strength, resistance, and power – characteristics of vulnerability in older adults^{23,25}. Vulnerable older adults have impairments in postural adjustments, proprioception, and gait. These deficits increase the risks of imbalances and falls. Therefore, it is necessary to analyze the harms and benefits of medication prescriptions and the impact that potentially inappropriate medications (PIM) have on the health of older adults²⁶.

All potentially inappropriate medications found in the medical records, such as glibenclamide and omeprazole, which act on the gastrointestinal system and metabolism, were the first and second most prescribed, respectively. Similar results were also found in a study conducted with elderly users of Primary Health Care, where the medication glibenclamide (25%) was the most prescribed among all potentially inappropriate medications, followed by omeprazole (23.4%)¹. Glibenclamide is an oral hypoglycemic agent used in the treatment of diabetes mellitus^{27,28}, but it can be harmful to older adults as it can cause prolonged lowering of blood glucose, posing risks to metabolic stability.

Omeprazole is commonly indicated for the treatment of gastrointestinal disorders related to stomach acid secretion⁷. According to CBMPI, this drug should not be recommended for older adults as its prolonged use can lead to osteoporosis, dementia, and renal failure. However, it is common for professionals to prescribe omeprazole incorrectly to treat side effects resulting from the simultaneous use of many medications established for older adults^{1,2,29}.

In this study, 65.5% of older adults who exhibited polypharmacy and did not have any PIM were classified as at risk of frailty. This may be associated with the use of medications that act on the nervous system, as approximately 23% of all prescribed medications presented in Table 2 were agents affecting the nervous system. Central nervous system-acting cholinergic antidepressants are considered inappropriate due to their sedative effects, which increase the risk of falls and fractures in patients¹. Benzodiazepines that act on the central nervous system have anxiolytic and anticonvulsant effects, and although suggested for anxiety and insomnia disorders—common issues faced by older adults—they may enhance the risks of falls, cognitive deficits, delirium, fractures, and further exacerbate the effects of depression^{8,9,30}.

The limitation of this study was its exclusive focus on an institution catering to individuals aged 60 and older. Additionally, the study design employed does not allow for the identification of a causal relationship between variables. Therefore, further studies are needed that address this topic and involve an older population attended to in different institutions within the city and state.

CONCLUSION

The use of polypharmacy and Potentially Inappropriate Medications (PIM) has been associated with the vulnerability of older adults, emphasizing the need for a careful assessment of medication prescriptions for this population. Medications have a significant potential to improve the functionality of bodily systems, but they can also be harmful in equal measure.

The healthcare of older adults is highly complex, demanding a balance between the benefits and risks inherent in promoting care with the aim of enhancing and maintaining the life expectancy of older population. Patient safety must be a paramount consideration when recommending medications. Establishing therapeutic priorities and effectively managing the treatment of each health issue presented by elderly patients is crucial. A rational analysis is necessary to determine which interventions are more urgent and which can be addressed in the long term, thus avoiding the simultaneous use of many medications and reducing the risk of unnecessary harm.

AUTHORSHIP

- Raquel Coelho de Andrade – Data analysis and interpretation, paper writing.
- Maira Mendes dos Santos – Contribution to data collection in the FUnATI Institution.
- Euler Esteves Ribeiro – Contribution to data collection in the FUnATI Institution.
- James Dean Oliveira dos Santos Júnior – Data analysis and interpretation.
- Hércules Lázaro Morais Campos – Supervision and guidance for article production. Approval of the version to be published.
- Elisa Brosina de Leon – Conceptualization, supervision, data analysis and design. Guidance for paper production. Approval of the version to be published.

ACKNOWLEDGMENTS

We thank the Fundação Universidade Aberta da Terceira Idade (FUnATI) for contributing to the completion of this research.

Edited by: Marquiony Marques dos Santos

REFERENCES

1. Parrela SL, Lima MS, Ramos PT, Penha RM, Santos VP, Barbosa SR, et al. Uso de medicamentos potencialmente inapropriados para idosos em Unidades de Atenção Primária à Saúde. *Rev Conjecturas*. [Internet] 2022 [access: January 15, 2023]; 22(7):438–455. Available at: <https://doi.org/10.53660/conj-s24-1207>
2. Oliveira PC, Silveira MR, Ceccato MD, Reis AM, Pinto IV, Reis EA. Prevalence and factors associated with polypharmacy among the elderly treated in primary healthcare in Belo Horizonte, state of Minas Gerais, Brazil. *Ciência e Saúde Coletiva*. [Internet] 2021 [access: January 15, 2023]; 26(4):1553–1564. Available at: <https://doi.org/10.1590/1413-81232021264.08472019>
3. Dantas MS, Santos VC. Implicancias de la polifarmacia en personas mayores y la contribución de la atención farmacéutica. *Lecturas: Educación Física Y Deportes*. [Internet] 2018 [access: January 15, 2023]; 23(240):87-99. Available at: <https://www.efdeportes.com/efdeportes/index.php/EFDeportes/article/view/273>
4. Pereira KG, Peres MA, Lop D, Boing AC, Boing AF, Aziz M, et al. Polifarmácia em idosos: Um estudo de base populacional. *Revista Brasileira de Epidemiologia*. [Internet] 2017 [access: January 20, 2023]; 20(2):335–344. Available at: <https://doi.org/10.1590/1980-5497201700020013>
5. Souza AM, Santos BR, Oliveira CL, Ribeiro EA, Nogueira L, Meneghin MM, et al. Vulnerabilidade clínico-funcional de idosos em polifarmácia segundo os critérios de Beers. *Revista Eletrônica Acervo Saúde*. [Internet] 2022 [access: January 20, 2023]; 15(11):e11395. Available at: <https://doi.org/10.25248/reas.e11395.2022>
6. Silva AF, Silva JP. Polifarmácia, automedicação e uso de medicamentos potencialmente inapropriados: causa de intoxicações em idosos. *Revista Médica de Minas Gerais*. [Internet] 2022 [access: January 20, 2023]; 32:e32101. Available at: <https://doi.org/10.5935/2238-3182.2022e32101>
7. Moreira FS, Jerez-Roig J, Ferreira LM, Dantas AP, Lima KC, Ferreira MA. Use of potentially inappropriate medications in institutionalized elderly: Prevalence and associated factors. *Ciência e Saúde Coletiva*. [Internet] 2020 [access: January 20, 2023]; 25(6):2073–2082. Available at: <https://doi.org/10.1590/1413-81232020256.26752018>
8. Gatto CM, Jorge MS, Wibelinger LM, Bertolin TE, Portella MR, Doring M. Prevalência de polifarmácia, benzodiazepínicos e fatores associados em idosos institucionalizados. *Revista Brasileira de Ciências Do Envelhecimento Humano*. [Internet] 2019 [access: March 2, 2023]; 16(3):47–58. Available at: <https://doi.org/10.5335/rbceh.v16i3.7797>
9. Neves FS, Sousa R, Ferreira FM, Pinheiro AC, Pires LM, Meurer IR. Avaliação de medicamentos potencialmente inapropriados e da polifarmácia em pacientes idosos em um hospital universitário. *HU Revista*. [Internet] 2022 [access: March 2, 2023]; 48(1):1–8. Available at: <https://doi.org/10.34019/1982-8047.2022.v48.36065>
10. Vivanco MV, Formiga F, Riera IM, Laporte AS, Prieto DC. Población muy anciana institucionalizada de Barcelona: valoración de la fragilidad según el índice frágil-VIG y análisis de la adecuación terapéutica según los criterios STOPP-frail. *Revista Española de Geriatria y Gerontología*. [Internet] 2019 [access: March 15, 2023]; 54(6):334–338. Available at: <https://doi.org/10.1016/j.regg.2019.06.004>
11. Shade MY, Berger AM, Chaperon C, Haynatzki G, Sobeski L. Adverse drug events reported by rural older adults. *Geriatric Nursing*. [Internet] 2017 [access: March 15, 2023]; 38(6):584–588. Available at: <https://doi.org/10.1016/j.gerinurse.2017.04.008>
12. Martínez-Arnau FM, Prieto-Contreras L, Pérez-Ros P. Factors associated with fear of falling among frail older adults. *Geriatric Nursing*. [Internet] 2021 [access: March 15, 2023]; 2(5):1035–1041. Available at: <https://doi.org/10.1016/j.gerinurse.2021.06.007>
13. By the 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *J Am Geriatr Soc*. 2023;71(7):1-30. doi:10.1111/jgs.18372
14. Fick DM, Semla TP, Steinman M, Beizer J, Brandt N, Dombrowski R, et al. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. *Journal of the American Geriatrics Society*. [Internet] 2019 [access: April 13, 2023]; 67(4):674–694. Available at: <https://doi.org/10.1111/jgs.15767>

15. Oliveira MG, Amorim WW, Oliveira CR, Coqueiro HL, Gusmão LC, Passos LC. Consenso brasileiro de medicamentos potencialmente inapropriados para idosos. *Geriatrics, Gerontology and Aging*. [Internet] 2017 [access: April 13, 2023]; 10(4):168–181. Available at: <https://doi.org/10.5327/z2447-211520161600054>.
16. Santana PP, Ramos AD, Campos CE, Andrade M, Menezes HF, Camacho AC, et al. O impacto da polifarmácia na qualidade de vida de idosos. *Revista de Enfermagem UFPE on-line*. [Internet] 2019 [access: April 20, 2023]; 13(3):e773. Available at: <https://doi.org/10.5205/1981-8963-v13i3a235901p773-782-2019>
17. Melo LM, Vale BN. Polifarmácia: Uso De Medicamentos Por Idosos. *Amazônia Science & Health*. [Internet] 2018 [access: April 20, 2023]; 6(4):13–16. Available at: <https://doi.org/10.18606/2318-1419/amazonia.sci.health.v6n4p13-16>
18. Fundação Universidade Aberta da Terceira Idade (FUNATI). [Internet]. Manaus AM: editora FUNATI; 2019. Quem somos; [access: April 20, 2023]; [1 tela]. Available at: <https://funati.am.gov.br/quem-somos/>.
19. Frota JG, Carvalho IA, Marques MM, Brito E, Ataíde DS, Ribeiro EE, et al. Doenças crônicas e aspectos de saúde de idosos amazonenses. *Revista Amazonense de Geriatria e Gerontologia*. [Internet] 2021 [access: April 21, 2023]; 12(1):1-10. Available at: <https://doi.org/10.53817/1983-6929-ragg-v12n1-10>
20. Moraes EN, Carmo JA, Moraes FL, Azevedo RS, Machado CJ, Montilla DE. Clinical-Functional Vulnerability Index-20 (IVCF-20): Rapid recognition of frail older adults. *Revista de Saúde Pública*. [Internet] 2016 [access: April 20, 2023]; 50:1–10. Available at: <https://doi.org/10.1590/S1518-8787.2016050006963>
21. Nascimento RC, Álvares J, Júnior AA, Gomes IC, Silveira MR, Costa EA, et al. Polifarmácia: uma realidade na atenção primária do Sistema Único de Saúde. *Revista Saúde Pública*. [Internet] 2017 [access: April 22, 2023]; 51(2):e19. Available at: <https://doi.org/10.11606/s1518-8787.2017051007136>
22. Aires JM, Silva LT, Frota DL, Dewulf NL, Lopes FM. Medicamentos potencialmente inapropriados prescritos a pacientes de um Centro de Referência em Atenção à Saúde da Pessoa Idosa. *Revista Brasileira de Geriatria e Gerontologia*. [Internet] 2020 [access: April 22, 2023]; 23(4):e200144. Available at: <https://doi.org/10.1590/1981-22562020023.200144>
23. Bolina AF, Gomes NC, Marchiori GF, Pegorari, MS, Tavares DM. Potentially inappropriate medication use and frailty phenotype among community-dwelling older adults: A population-based study. *Journal of Clinical Nursing*. [Internet] 2019 [access: April 22, 2023]; 28(21–22):3914–3922. Available at: <https://doi.org/10.1111/jocn.14976>
24. Spekalski MV, Cabral LP, Grden CR, Bordin D, Bobato GR, Krum EA. Prevalência e fatores associados à polifarmácia em pessoas idosas de uma área rural. *Revista Brasileira de Geriatria e Gerontologia*. [Internet] 2021 [access: April 28, 2023]; 24(4):e210151. Available at: <https://doi.org/10.1590/1981-22562021024.210151>
25. Rocha IP, Sales AS, Magalhães J, Oliveira S. Farmacodinâmica E Interações Medicamentosas Geriátricas: Reflexão Sobre Medicamentos Teaching Training for. *Revista Humanidades e Inovação*. [Internet] 2021 [access: April 23, 2023]; 8(45):e12.
26. Kim J, Parish AL. Polypharmacy and Medication Management in Older Adults. *Nursing Clinics of North America*. [Internet] 2017 [access: April 23, 2023]; 52(3):457–468. Available at: <https://doi.org/10.1016/j.cnur.2017.04.007>
27. Nery CG, Pires MA, Pianetti GA, Vianna-Soares CD. Caracterização do fármaco hipoglicemiante glibenclamida. *Revista Brasileira de Ciências Farmaceuticas/Brazilian Journal of Pharmaceutical Sciences*. [Internet] 2008 [access: February 11, 2023]; 44(1):61–73. Available at: <https://doi.org/10.1590/S1516-93322008000100008>
28. Farias AD, Lima KC, Oliveira YM, Leal AA, Martins RR, Freitas CH. Prescription of potentially inappropriate medications for the elderly: A study in primary health care. *Ciência e Saude Coletiva*. [Internet] 2021 [access: March 22, 2023]; 26(5): 1781–1792. Available at: <https://doi.org/10.1590/1413-81232021265.04532021>
29. Palmeiras G, Bastos J, Flores V, Braga D, Braga T, Dores R. marIncidência do uso de benzodiazepínicos em idosos e os riscos associados. *Journal of the Health Sciences Institute*. [Internet] 2022 [access: March 28, 2023]; 40(1):59–66.
30. Carvalho FP, Sasaki NS, Pancote CG, Santos ML, Gomes L. Investigação do uso de psicotrópicos potencialmente inapropriados por idosos. São Paulo. *Rev Recien*. [Internet] 2021 [access: March 28, 2023]; 11(34):225-233. Available at: <https://doi.org/10.24276/rrecien2021.11.34.225-233>



Contemporary care model for the aged: an imminent need

Renato Peixoto Veras¹ 

Abstract

Is it possible to age with health and quality of life in Brazil? This article defers the answer through the proposition of a cost-effective care model, in line with what is most contemporary in comprehensive care for the elderly age group. The model presented here proposes to think, in an absolutely innovative way, the care that must be provided to this portion of the population. In this text, the theory and concepts that underlie the proposed model are presented. Basically, the text reports the need for emphasis on light instances of care; in other words, focus on coordination, prevention and customer monitoring, in order to minimize waste, offering better quality care and reduced costs. The epidemiological assessment instruments used and the step by step of all health professionals are also presented.

Keywords: Older people.
Care Model. Prevention.
Health Promotion.

¹ Universidade do Estado do Rio de Janeiro, Universidade Aberta da Terceira Idade. Rio de Janeiro, RJ, Brasil.

There was no funding for the execution of this work.

The authors declare that there is no conflict in the conception of this work.

Correspondence
Renato Peixoto Veras
unativeras@gmail.com

Received: December 08, 2023
Approved: February 27, 2024

INTRODUCTION

The increased life expectancy of Brazilians represents a major achievement. Live longer – grow old – this has become a reality in the last few decades and is set to become even more so in the future. However, citizens having the chance to live these extra years to the full, while maintaining functional capacity, health and quality of life, should also be a part of this advance. In recent years, a number of institutions and their research teams have investigated changes in the model of health service provision. Not only is this need imminent but, more importantly, feasible.

The health care of the older population can be restructured in the sector toward providing better care outcomes at a lower cost. But what is required for this to come about? That all actors in the sector take a lead in achieving the necessary changes and be open to innovation. In many instances, innovating may merely require returning to simpler care practices and recovering values lost amid the current national health system.

In today's reality, living into one's 80s, 90s or beyond has become relatively commonplace. Nevertheless, there are deep concerns over the current care model, since these additional years of life should not be marked by suffering, pain and high health-related costs.

Incorporating the knowledge, theory and application of these instruments into daily clinical routine is pivotal for this care logic to take root in Brazil and for both public and private health sectors to offer improved care to the older population - the fastest growing age group worldwide. Failure to change the care model for older adults could have dire consequences for the future.

Therefore, the primary objective of this article is to help further the design of more effective care models tailored to the specific settings and characteristics of the aged population.

Demographic transition

All of the demographic predictions about growth of the older population made in the 1980s have materialized. If anything, these estimates have erred toward underestimating the trends, since figures are even greater than initially envisaged¹⁻³.

Increased longevity is a major triumph for mankind. Surviving into late-life used to be a rare privilege that, today, has become something of a norm in Brazil and likewise among many developing countries (according to the 2022 IBGE census, over 37,814 Brazilians were 100 or older!). There has been a substantial improvement in the health parameters of the population, although this has not occurred uniformly across all countries and socioeconomic contexts. However, the greatest triumph of the 20th century brings with it a major challenge: caring for this age group and conferring quality to the extra years of life.

In 2002, the World Health Organization (WHO) released a publication with a policy framework for active aging, defined as the process of optimizing opportunities for health, participation and security to enhance quality of life as people age. Drawing on the definition of active aging, 3 key pillars of this paradigm emerge: health, participation and security^{4,5}.

The health pillar transcends the purely physical realm – a fact backed by evidence from a host of scientific fields – to encompass the area of mental health and social wellbeing, all recommended targets of public policy interventions.

In Brazil, the shift in the age breakdown, with a proportionally larger older population, is a relatively recent phenomenon. The Brazilian population has grown markedly over the past 70 years. Moreover, the increase in the aged population has far outstripped that of other countries.

In 1950, the statistics show that, the total Brazilian population numbered 54 million, rising to 213 million by 2020. According to projections,

the population will grow further to 229 million by 2050 and decline to 181 million by 2100. The absolute growth has been a factor of 3.3 within the space of 150 years (lower than the 4.3-fold increase in the global population)⁶.

In this respect, the decline in Brazil's population is underway, evidenced by the significant drop in numbers at the last census, in other words, the Brazilian population is already shrinking.

While the growth in the Brazilian population as a whole was high, the increase in the older age stratum exceeded the global average. The contingent of older Brazilians aged 60 or over was 2.6 million in 1950, rose to 29.9 million in 2020 and is set to reach 72.4 million in 2100 (absolute increase of 27.6 times). In relative terms, the older population aged 60 or over accounted for 4.9% of the total population in 1950, a proportion rising to 14% in 2020 and set to reach a whopping 40.1% in 2100 (relative 8.2-fold increase in proportion between 1950 and 2100).

The absolute number of older Brazilians aged 65 or over was just 1.6 million in 1950, rose to 9.2 million in 2020 and is set to reach 61.5 million in 2100 (estimated absolute increase of 38.3 times). In relative terms, the older population aged 65 or over accounted for 3% of the overall population in 1950, rising to 9.6% in 2020 and set to exceed one third (34.6%) by 2100 (11.5-fold percentage increase between 1950 and 2100)⁶.

The number of older Brazilians aged 80 or over was 153,000 in 1950, rose to 4.2 million in 2020 and is projected to reach 28.2 million in 2100. The absolute growth in this age group was a spectacular 184.8 times over the space of 150 years. In relative terms, this oldest-old population represented only 0.3% of the total population in 1950, a proportion that increased to 2% in 2020 and is set to reach 15.6% in 2100 (an impressive 55.2-fold increase in rate between 1950 and 2100).

The most striking data is that, according to the 2019 revision of projections by the UN, the total number of Brazilians is predicted to peak at a population of 229.6 million in 2045, although this figure is widely believed to be an underestimate. The absolute number of older individuals will continue to

rise, where the groups aged ≥ 60 years (79.2 million) and ≥ 65 years (65.9 million) will peak in 2075. The group aged ≥ 80 (28.5 million) will reach its peak just in 2085. The absolute number of older adults is set to decline in the last two decades of the 21st century. However, the percentage of older individuals as a proportion of the overall population will continue to rise, accompanied by additional responsibilities and opportunities⁷.

Taken together, these data indicate that the future of the 21st century will be a grey one, i.e., the percentage of older people will reach levels never before seen in history. The Brazilian case is no different, but the process of population aging is even stronger, with the proportion of older people exceeding the global average. From a demographic standpoint, this is a crucial issue, since the high-income countries underwent more gradual growth over the course of the 20th century and, with their economic power, had more time to offer this contingent of the population better structure and resources.

Brazil must take on the task of ensuring quality of life for its senior citizens who, as per the majority of Brazilians, have low education and poor social protection. Health-wise, this group has a high prevalence of multiple chronic diseases⁸ (group of diseases associated with multiple causes, characterized by gradual onset, typically unclear prognosis, and long or undefined duration). These diseases have a changing clinical course with potential phases of worsening and resultant disability. These conditions require interventions entailing lifestyle changes in a process of permanent continuous care and supervision⁹, representing an economic burden for society¹⁰ due to the growing demand for healthcare services. Aged patients, compared with other age groups, tend to have longer, more frequent, hospital stays. This situation has major economic, welfare and social repercussions.

Human aging should not be regarded as a burden. Social policies must be devised for this group. In the health field, care should be managed in a more contemporary and adequate way to safeguard this wealth of knowledge and experience without this becoming overly costly for the sector. This also creates the need to expand¹¹ and to qualify health professionals to deal with chronic diseases.

Also, this calls for constructing an innovative quality model, given the current system is outdated and the root cause of the current poor service and health crisis. This is especially true for older users, the patient group associated with the greatest demand and cost with respect to healthcare.

The modelling of this new framework should address and outline the points set forth in this article.

Chronic disease and care model

In Brazil, the leading cause of mortality and morbidity are chronic non-communicable diseases (NCDs), which typically develop slowly over long periods and have difficult-to-predict long-term effects. Neuropsychiatric disorders account for a large proportion of these NCDs¹².

In a 2015 report, the World Health Organization (WHO) noted that, of the 38 million lives lost in 2012 due to NCDs, 16 million (42%) were premature and avoidable (Carvalho, Marques & Silva, 2016). As the costs of managing these disease mounts worldwide, they account for an increasing chunk of public and private expenditures¹⁴.

Chronic conditions traditionally include cardiovascular diseases, diabetes, asthma, chronic obstructive pulmonary diseases (COPD) and chronic degenerative diseases. With improved survival rates, this group of diseases now also includes many types of cancer, HIV/AIDS, neuropsychological disorders (such as depression, schizophrenia and dementia), arthroses and visual/auditory deficits. Most of these conditions have no cure but many can be prevented or controlled through early detection, by adopting healthy habits and diet, engaging in regular exercise, and accessing adequate timely treatment.

In addition, many of these chronic diseases constitute a set of conditions, where some authors and institutions define individuals with multiple co-occurring conditions as complex patients, characterized by a profile of chronic presentation. The most prevalent features differentiating this group include the presence of several concomitant chronic diseases, high use of urgent hospital services

with several episodes during the same given year, temporary or permanent reduction in personal autonomy, and polypharmacy. There may also be other associated factors, such as advanced age, living alone or with low family support and fall episodes, among others¹⁵.

Various chronic conditions are linked to an aging society, but also to life-style choices, such as smoking, alcohol use, sexual behaviour, poor diet and low physical activity (sedentarism), besides genetic predisposition. The common feature these conditions share is the need for a complex long-term response coordinated by health professionals from a range of disciplines, with access to the required medications and equipment, as well as strategies to encourage patient adherence to treatment and also social welfare. However, most health care and services are still geared up for dealing with acute episodes.

Against this backdrop, the management of chronic diseases is increasingly regarded as an important issue by managers and researchers worldwide who seek interventions and strategies to tackle these conditions. It is important to emphasize that improvements in the quality of life of the population are derived from a series of factors, including the technological advance seen in many fields of knowledge and in modern science.

Changes needed in the system of healthcare for the older population: moving away from a disease-centred approach

The demographic transition and improved social and economic indicators in Brazil, relative to previous decades, has led to growth in the contingent of older adults and placed a greater financial pressure on public and private healthcare systems. Expansion in this stratum of the population is accompanied by an increase in chronic diseases and associated costs.¹⁶ An upshot of this growth is a rise in demand for health services which, in turn, creates a shortage and/or restriction in resources. Compared to younger individuals, hospital admission is more frequent and hospital stays longer in the older age group, given than diseases affecting these individuals are predominantly chronic and multiple, i.e., require constant monitoring and permanent care¹³.

Over the past decade, evidence has shown that most public-health problems that affect the population, including both communicable and non-communicable diseases, are in fact preventable. This statement is borne out by the significant decline in mortality from cardiovascular and cerebrovascular diseases, the fall in incidence and deaths related to cervical cancer, and also the decrease in the prevalence of tobacco use and rates of lung cancer in men¹⁷.

A shortcoming of most care models is that they are disease-centred. Sadly, preventive actions are still regarded as a burden of procedures and additional costs. However, this approach should be recognized as a strategy which, over the medium-to-long term, can reduce admissions and other much higher-cost procedures¹⁸.

All evidence points to the fact that biomedicine-based health systems will eventually run into sustainability problems. This fact suggests that programs for aged clients should be built based around integrated care, with an active role of health professionals and their team in managing not only the disease but the person, making judicious use of the available technology and of quality information and routine monitoring. Medical specialists, hospital, drugs, clinical tests and imaging scans are also an integral part of this optimal care model, but the approach should be centred on low-complexity interventions and follow-up of clients by their doctor¹⁹.

A contemporary health care model for the aged should incorporate a combined flow of education actions, avoidable disease prevention, disease onset delay, timely treatment, and rehabilitation of health problems²⁰. In other words, a line of care for older patients that seeks to be effective and efficient must be underpinned by a coordinated informed network and boast an information technology system designed and tailored to this logic.

Why the gap between discourse and practice?

Before examining the care model proposed in detail, a question must first be addressed. A consensus exists: all stakeholders, bar none, are in favour of this new line of care. Most, however, practice the opposite of what they preach.

The care model for older adults, when properly implemented, is an exception. In the seminal study by the National Health Agency (ANS), headed by Dr. Martha Oliveira in 2018²¹, this gap between discourse and practice is exposed.

The time for novelty and oft repeated clichés acknowledged by all (even those who do not heed them) is over. It is laudable to speak of the theoretical frameworks or policies promoting health aging - defined as maintaining functional capacity and autonomy into late-life, as well as quality of life, consistent with the principles and guidelines of the Brazilian National Health System (SUS) focusing on disease prevention.. Prominent national and international health bodies and societies have advocated this concept for many years^{15,22}. However, the next step forward must now be taken²³.

At this juncture we pose the question: if everyone is discussing the issue and the solutions have been put forward, why then has the situation stayed the same? Why has theory not become part of routine practice? Why have decision-makers not ushered in change?

In order for the health sector to advance, particularly that of geriatrics/gerontology, one of the issues that must be tackled is distrust. Today's society questions everything that is offered. With this level of no confidence, any proposed changes tend to be viewed with caution. Invariably, things which are multifactorial and constructed over many years are hard to transform. Changing a culture is no easy task. This point warrants deeper examination.

Another stumbling block is care quality, an under-valorised aspect. This is a hugely important issue which calls for greater awareness of health professionals and society alike. Some argue it would be too costly to apply tools for rating care, accreditations and certifications, yet qualified services are more cost effective, less wasteful and deliver better care outcomes for patients.

Furthermore, there is a generally-held notion that caring for aged patients transcends health. Besides diagnosis and prescription, elements such as social participation, and both physical and mental activities, are crucial to maintain good functioning. However,

difficulties remain in accepting these actions as an integral part of care, especially in supplemental health. There is a tendency to separate “social” actions from “curative” actions.

And concerning the model for remunerating health professionals? This group is generally underpaid, so why not adopt performance-related pay? Associating the discussion of outcomes with the form of remuneration is a powerful tool incentivizing doing the right thing. Thus, pay for performance (P4P) or performance-related pay (PRP) have become synonymous for the struggle to align access with care quality. Change in the remuneration model based on this new care framework, focusing on results rather than volume, needs to be a win-win type model, in which all stakeholders benefit, but particularly the patients.

In order to put into practice all of the actions needed for healthy aging with quality of life, care for the aged population needs to be rethought and redesigned, with an emphasis on the older adult and their particularities.

This will result in benefits, quality and sustainability, not only for the aged population, but for the Brazilian health system as a whole^{8,24}.

With a clearer view of the way forward, it is time to step up and muster concerted efforts that transform theory into a care model offering quality for all, including the older population. It is an undesirable situation for the SUS to fragment or for there to be an increase in bankruptcies of private healthcare companies.

One thing is starkly clear: for every year that goes by, the cost of health increases while the quality of care declines. Such a system is unsustainable. It is high time, therefore, to put into practice what all advocate but fail to implement.

Aging and health

Health can be defined as a measure of the individual capacity to realize aspirations and satisfy needs, irrespective of age or the presence of diseases⁸. Thus, the need for an efficient cost-

effective comprehensive geriatric assessment has become increasingly pressing. The goals of this assessment are to enable early diagnosis of health problems and to plan support services wherever and whenever needed to allow individuals to continue to reside in their homes. Traditional history taking, physical check-up and differential diagnosis are insufficient to provide a comprehensive evaluation of the range of functions needed for daily living of aged individuals²⁵.

In the book entitled “*Repensando a saúde: estratégias para melhorar a qualidade e reduzir os custos*” (Rethinking health: strategy for enhancing quality and reducing costs), Michael Porter and Elizabeth Teisberg (2009) maintain that health comes before care. In their opinion, the need to measure and minimize risk of disease, offer comprehensive management of diseases, and ensure prevention services for all clients, including those who are healthy, is unclear. In this context, the authors state that health should involve preparation for the service that increases the effectiveness of the value chain (set of activities carried out by an organization, such as supplier relations, production/sales cycles and final distribution). This concept was first introduced by Michael Porter in 1985: intervention; recovery; monitoring and management of the clinical condition; guaranteed access; results measurement; and information dissemination.

Health systems comprise several points of care that do not work in an integrated fashion. In general, entry into this uncoordinated network typically occurs when the client is at an advanced stage, where the “front door” tends to be the emergency department of the hospital. This model, besides being inadequate and anachronous, has a dire cost-benefit ratio, since it makes intensive use of highly expensive technology. Its failings, however, should not be blamed on the clients, but on the care model itself, which overloads the higher complexity levels due to a lack of care at primary levels. Home-based care may represent an alternative for some cases. Home care should not be seen as a fad but as a more modern modality of care (Veras, 2020b). However, the advent of the modern hospital is a relatively recent phenomenon in that, not long ago, care was traditionally administered within the home setting²⁶.

A prospective study of disease management²⁷ offered to beneficiaries of Medicare (health insurance system for older adults managed by the North-American government) showed that actions failed to reduce expenses²⁸ and that physicians were unhappy with the insurance providers paying the costs of disease management, possibly reducing their income, besides interfering in the doctor-patient relationship. Disease management programs for aged individuals are even more complex and have a very low cost-benefit ratio, given that treating a disease properly only reduces the rates of morbidity associated with the condition. The best option is to structure models that work in an integrated manner and cater for the whole range of needs²⁹. If this approach is not taken, then the problem is hard to resolve, because other diseases and their frailties remain. Moreover, resources will not be used rationally³⁰.

Epidemiological information translates to the ability to predict events, allowing early diagnosis (especially for chronic diseases), delaying the onset of these conditions and improving both quality of life and the therapeutic approach. Determining health status of the aged population should consider the overall state of health, i.e., take into account a satisfactory level of functional independence, as opposed to merely the absence of disease. Thus, the notion of functioning can be construed as a paradigm for the health of older adults, representing one of the most important attributes of human aging, since it encompasses the interaction between physical and psycho-cognitive capacity to perform activities of daily living^{20,31}.

Well-being and functioning go hand in hand. They represent the presence of autonomy, individual decision-making ability and control over one's actions, establishing and acting on one's own convictions and independence – the ability to carry out something by one's own means – enabling the individual to take care of themselves and their life. It should be noted, however, that independence and autonomy, although closely related, are separate concepts³¹. Some people are physically dependent but are perfectly capable of deciding what activities they wish to engage in. Others, on the other hand, are physically able to perform certain everyday tasks, but not to choose how, when or where to carry out these activities²⁰.

Functional evaluation defines the correct stratification and allocation of the aged patient into the line of care required, and also allows their care behaviour to be predicted. Functional autonomy is an important predictor of health of older adults, but systematically assessing the whole aged population using long comprehensive scales is far from ideal. A variety of assessment tools is available for screening risk and organizing entry to the health system, validated and translated into Portuguese.

A two-stage approach, dedicating full evaluation only to individuals at high risk, as detected by a process of screening, is more effective and less painstaking. For the first stage of rapid screening, a tool meeting the following criteria should be employed:

- simple and safe;
- short application time and low cost;
- accurate for detecting the risk investigated;
- validated for use in the population and for the condition being checked²;
- acceptable sensitivity and specificity;
- have a well-defined cut-off point.

During the first contact, the PRISMA-7 should be used, developed in Canada for screening²⁶ risk of functional loss in older adults¹³. Comprising 7 items, a validated, transculturally-adapted version of the scale for use in Brazil indicates the ideal cut-off for the population to be 4 points (4 or more positive responses). The scale requires no special materials, qualification or extensive training and can even be self-administered. Application time is 3 minutes and sociocultural and educational level do not influence comprehension of the questions.

The PRISMA-7 has been used systematically at the “front door” to the health system in Canada and by the British Geriatrics Society and Royal College of General Practitioners in the United Kingdom as a screening tool for functional loss and frailty³².

The innovation needed

Socioeconomic transformations and their consequent shifts in lifestyle in contemporary societies – with changes in eating habits, increased sedentarism, and stress, coupled with the rising life expectation of the population – contribute to a higher incidence of chronic illnesses which today represent a serious public health problem³³.

The way forwards is to take the right steps, with focus centred on the most important element in the whole process: the patient³⁴. Care should be organized in an integrated fashion and treatment coordinated throughout the care pathway in a network logic^{9,34}. The model should be based on early identification of risks of frailty of the user. Once risk has been identified, the priority is to intervene before the onset of illness, thereby reducing the impact of chronic conditions on functioning. The idea is to monitor health, not disease, within a logic of continued follow-up, varying only in terms of level, intensity and intervention scenario³⁵.

It is important to attain better more financially economical care outcomes. This requires everyone involved to understand the need for change and allow themselves to innovate in terms of care delivery, means of remuneration and assessment of the quality of the sector.

This will result in benefits, quality and sustainability not only for this population group, but also for Brazilian health as a whole¹⁹. The effects of this change of model will be felt immediately by users. This transformation of the health system toward sustainability will become evident in the medium-term.

Care model

In international frameworks, the generalist physician or family doctor fully handles 85-95% of their patients, without the need for the intervention of specialists. In addition, this doctor can recruit health professionals with specific backgrounds (Nutrition, Physiotherapy, Speech Therapist etc.), but it is the generalist who recommends them and performs referral³⁶.

The British model, the National Health Service (NHS), is centred on the generalist doctor who has a high resolutive capacity, called the general practitioner (GP)³ (in the United Kingdom, the GP is a special doctor who earns a bigger salary than specialists and is highly valued by British society. General practitioners are considered the “true doctors”, because they “know everything”) and a close bond with the patient²⁷. Universal access to these professionals is guaranteed, regardless of income or social level, akin to the Brazilian Unified Health System (SUS).³⁷ When registering with a GP, British citizens receive free state medical care at health clinics manned by a team consisting of generalist physicians and nurses. Any treatment needed, if not extremely urgent or due to an accident, will be administered at the local clinic³⁸. By contrast, under the North-American model, patients are referred to numerous specialists. These are two wealthy countries with a long tradition in medicine. They operate, however, different systems which provide very different results³⁹.

A recent study involving developed countries conducted by the Organization for Economic Co-operation and Development (OECD), showed the difference in health costs in the US compared with other wealthy countries with good quality care⁴⁰ – where spending on health care^{28,31}, naturally, is larger than in developing countries. Nevertheless, spending by North-Americans is far greater. In 2017, spending per capita reached US\$ 10,224, or 28% higher than in Switzerland and over double that of the UK. These figures highlight that investing heavily in the treatment of diseases does not suffice.

Specialists are generally perceived as being more limited since they only have expertise in a single specialty. In the eyes of British patients, GPs are the best doctors.

In some countries, accreditation and assessment of quality indicators are obligatory requisites. In Brazil, priority is placed on volume. A policy for incentivizing quality is currently lacking. Patients do not always recognize this as a need, and both public and private health providers regard this as an extra cost. Although these needs are acknowledged by most health managers, little is done to improve the

situation. Thus, for a well-structured care model²⁵, certain elements are essential. For example, the Statute for the Aged, enacted under Law no. 10.741 in October 2003, is a set of laws designed to defend and protect older citizens, defined as individuals aged 60 or over⁴¹.

In Brazil, there is an excess of consultations by specialists, because the current care model follows the North-American logic, promoting fragmentation of care²⁸. Quality care requires greater awareness from health managers and society. Some claim that applying instruments to gauge service quality and introducing accreditations and certifications would prove too costly, but qualified services are more cost-effective, less wasteful and have better care outcomes for patients.

The model proposed here is structured around low intensity levels of care, i.e., lower costs and consisting basically of care delivered by well-trained health professionals and involving epidemiological screening instruments, besides the use of monitoring technologies³¹. It is paramount, especially in today's world, that information pertaining to clients and their electronic medical records are available on the cloud, accessible from computers or cell phones anytime and anywhere, so that physicians and other health professionals may monitor the client when necessary⁴².

A concerted effort should be made to ensure that patients remain within the sphere of low intensity levels of care, in a bid to maintain their quality of life and social participation. The target goal is to ensure over 90% of older adults enjoy this level of care⁴³.

It is argued the portfolio of clients should contain individuals aged 50 or older. Too young? Not exactly.

Although not older adults, the epidemiology shows that it is from this age that chronic diseases begin to manifest. And the earlier the structure of a model of education in health and prevention is established, the greater the chances of success.

However, defining a cut-off from 55 or 60 years and older is also possible. In Brazil, the status of being aged is defined as occurring from 60 years onwards¹⁷.

Teams are based on a duo of professionals: a geriatric doctor and a gerontological nurse. This pair is responsible for the health of a portfolio of around 800 clients. Working weeks are defined at 20 hours for doctors and 25 for nurses. The geriatrician performs clinical management; the nurse, specialized in Gerontology, acts as care manager, monitoring the health status of users and consolidating the role of contact person for support and of strengthening ties with the patient's family.

A brief functional evaluation is carried out on the first contact. This serves as a reference baseline for monitoring and as a parameter for following the therapy plan between different points in the system.. The care manager is tasked with overseeing the transition of care between services and reevaluates the patient's functional capacity annually, or as and when necessary, encouraging their participation in the process. The care manager's function is key to the model proposed and their involvement mirrors that of navigator in the North-American system, a role created to help guide more frail patients.

The function of navigator can be found in some providers/operators in the United States and their role is central in the present proposed framework. According to the American Medical Association, this professional is responsible for managing the care of users throughout the different levels of complexity of the health system, checking whether prescriptions and orientations are being observed³⁴.

Besides the geriatrician and nurse, the multidisciplinary team consists of a physiotherapist, psychologist, social worker, speech-language therapist, nutritionist, physical educator and workshop leaders (professionals engaged in integrative dynamic activities linked to the program). In the event that user care needs are identified at other levels of care, referrals are made to specialists but always via the generalist doctor.

It is important to point out that the model does not retain specialists, with some exceptions, such as when there is a large contingent of frail individuals at a clinic. In this case, six specialized areas related to the model are recommended, because these are part of the annual evaluations, or aiding the

generalist doctor, given their specificity, demand and high prevalence. These 6 specialties are in areas in which annual preventive and control exams are conducted, namely: Cardiology, Gynaecology, Uroproctology, Dermatology, Speech-Language therapy, and Ophthalmology. It should be noted that, of this list of professionals, the Otorhinolaryngology/ENT specialist need not be a doctor but rather a speech-language therapist).

Consultation with the specialists listed is only possible upon request by the patient's GP. Thus, if the client requires care of a given specialist, the other specialties will not be involved. The same reasoning applies to hospital admission. Doctors and nurses are in charge of contacting the physician of the hospital, to be briefed on the case, preferably seeking to ensure best care with shortest hospital stay.

Client entry

Entry occurs via an action referred to as reception, which takes place in two stages. The first stage is administrative and institutional in nature, when an in-depth presentation of the actions proposed is made, with an emphasis on health promotion and disease prevention. Users thus have a better grasp of the model and the overall dynamic of differential care which will be offered to improve their health and quality of life. Moreover, participation of older users should be encouraged, because this is integral to this healthcare model²⁴.

In the second stage of reception, the care commences proper. As outlined previously, in order to organize access to the levels of the model, a risk identification screening questionnaire is applied: the PRISMA-7³⁵. After application of this rapid screener, the result will be stored on the information system. The patient then completes the other instruments comprising the functional evaluation. The functional evaluation entails a 2-step process performed by employing validated reliable instruments adopted by the leading geriatric research groups.

The Clinical-Functional Vulnerability Index-20 (IVCF-20) (<https://sistema.medlogic.com.br/>

ngIVCF20/ge/ standalone/671/646) measures 8 dimensions: age, self-rated health, activities of daily living (3 instrumental and 1 basic ADL), cognitive status, mood/behaviour, mobility (reach, grasp and pinch grip; aerobic/muscle capacity; gait and urinary/faecal continence), communication (vision and hearing) and presence of multiple comorbidities, indicated by polyopathy, polypharmacy and/or recent hospital admission. Each question is scored specifically according to⁴⁴ the performance of the subject, for a total of 40 points. In addition to the questions, several measurements, such as calf circumference, gait speed and weight/body mass index, are included to increase the predictive value of the instrument²⁴.

Scoring is categorized into 3 classifications: 0-6 points, the respondent likely has low clinical-functional vulnerability and does not require further assessment or specialist follow-up; 7-14 points, indicates increased risk of vulnerability and the need for more in-depth assessment and attention to identify the appropriate treatment for chronic conditions; ≥ 15 points²⁶, deemed high risk of vulnerability or existing frailty requiring more comprehensive assessment, ideally by a team specialized in geriatric-gerontological care with psychosocial support^{5,12}. The group headed by Professor Edgar Moraes^{8,45}, of the Federal University of Minas Gerais (UFMG), has made the instrument available on-line.

The Lachs Scale is applied after the IVCF-20. This probes other areas thereby conferring further robustness to the assessment results. This strategy of using 2 of the best epidemiological instruments aims to improve the reliability of results.

The Lachs Scale⁴⁶ – comprises 11 items (questions, anthropometric measurements and performance tests) and assesses areas commonly impaired in older adults: visual acuity, hearing, upper and lower limbs, urinary continence, nutrition, cognition and affect, ADLs, home environment and social support. The application of this instrument provides a rapid systematized means of identifying functional domains that should be subsequently assessed in more detail to establish a diagnosis and plan interventions.

- Katz scale – assesses basic activities of daily living⁴⁷.
- Lawton's scale – assesses instrumental activities^{48,49}.
- Mini evaluation of nutrition⁴⁵.
- Tinetti scale – test of balance and gait⁵⁰.
- Jaeger Card – assesses visual acuity⁵¹.
- Mini-Mental State Exam – Test by Folstein⁵².
- Geriatric Depression Scale – by Yesavage^{47,53}.

In addition to risk identification and screening protocols, other epidemiological instruments are applied annually. The doctor is the manager of follow-up and also of the interprofessional geriatric team, performing more in-depth assessment toward devising an intervention plan. This information will be collected and stored until the end of the care pathway. After this assessment, an individual therapeutic plan is defined that includes regular appointments²⁴, referral to the multidisciplinary team, community centres, and if applicable, assessment by specialists.

A unique longitudinal and multi-professional electronic medical record is then set up and used to store information at all levels of care under the care model, from first contact to end-of-life palliative care. This record should contain information on the patient's clinical history and physical exams, but also includes information on daily routine, family and social support etc. Information from other health professionals such as physiotherapists, nutritionists and psychologists etc. should also be held. Participation of the family, explanation of activities, and epidemiological screenings are other important features of this product. Information on all procedures is fundamental to allow monitoring of the client⁴.

One of main factors for controlling costs of the program is follow up at each level of care. This ensures there are no gaps in patient care when the case is referred to the care network, tertiary care is required or hospital-level treatment⁵³. The transition

across care levels is overseen by the management team, which strives to maintain a smooth flow of information, liaising with assisting professionals and seeking to adhere to the principle of management predominantly by the geriatrician-nurse dyad.

The control of hospitalization takes place via a flow to aid the client, ensuring that the health professionals assigned to the case are aware of the patient's clinical and therapeutic history, as well as the understanding that the individual has frequent follow-up and is set to return to their health team when the clinical condition has been controlled⁵⁴.

In the event of hospitalization, patient monitoring is performed daily on 2 fronts. For the first, the nurse keeps in touch with the family to provide support, clarification or to identify needs (pertaining to patient or family). The other front involves the prevention manager who provides liaison between the outpatient clinic and hospital, performing daily follow-up with the attending hospital physician. In hospitals which have internists, this contact is facilitated and direct. In other hospitals, support is provided by medical auditors or by the care team.

Thus, when the older adult needs to be admitted to hospital, this takes place more quickly, avoiding unnecessary procedures or admission to intensive care, ensuring post-discharge transfer³² to low intensity level care settings, without the need to consult several specialists⁵⁵. This all culminates in higher quality care, with a significant cost saving and positive impact on the medical loss ratio⁵⁶.

Technology features

A high-quality information system and lightweight technology is essential in helping to win the confidence of clients. Without using technology, this project cannot go forwards and thus competence is needed to use it to the full.

For example: the client, upon reaching the front-door of the health centre, may undergo facial recognition which automatically brings up their medical record at the reception desk. When receiving the client, the receptionist addresses them by name,

enquires after the family and checks the list of medicines they are using.

Another important feature is the availability of a cell phone app containing individualized information and reminders for appointments and prescribed actions. The app can, among other functions, request the client to take a photo of their breakfast and forward this to the nutritionist⁴⁰, who can then check whether the meal is balanced, contains adequate dietary fibre etc.

Although extremely simple, these actions confer great trust, making the client feel protected and valued from day one.

The information system, which commences with registration of the user, is one of the pillars of the program. Via the system, the entire care journey will be monitored at each level, checking the effectiveness of actions and contributing to decision-making and follow-up. This entails a unique electronic record that is longitudinal and multi-professional, and accompanies the client from initial reception, providing an integral assessment of the individual.

The pandemic and associated lockdowns pose a number of challenges to medical practices. In the proposed model, contact with the client can be increased, since, besides face-to-face meetings, consultations via telemedicine are also incorporated⁵⁷. The aim is not to replace encounters in person, but to introduce flexibility and convenience for scheduling times and days for consultations, given that neither the doctor (or nurse) nor the patient need travel to attend the session.

The drive for innovation and use of the latest technology provides closer contact of the health team with the client and family members. With a platform specifically designed for this care, the contact of gerontologists will be increased, enabling numerous individual or group-based actions involving a nutritionist, psychologist or physiotherapist, with counselling and broader contact with clients.

Besides the interdisciplinary team which delivers care directly, the model boasts a team of doctors and nurses working virtually. The GerontoLine relationship channel guarantees the users full-time

coverage 24/7. In passive mode, this receives calls from clients for guidance; in active mode, the team contacts patients on a regular basis keeping them on the care radar. Favouring this interaction, the professionals coordinating care (online) have access to the key information help in each patient's medical history.

GerontoLine differs from call centres, commonplace in traditional health services and which typically operate with poorly-trained staff who have a reputation for overuse of clumsy "gerund phrases"⁵⁵ and offer no support if the client's question or query falls outside the script.

With GerontoLine, which is available 24 hours a day, 7 days a week, the call is answered by trained health professionals who have access to the patient's records and, thus, have everything at their disposal to resolve problems⁵⁸. Should an ambulance need calling in the middle of the night, this professional handles the whole referral process. In the event of a call during the early hours, this attendant will send a message out to the doctor, explaining the reason for contacting them. Hence, first thing in the morning, the doctor can take the first measures necessary. In other words, the patient and their family members feel protected, since they know that if needed, there is a qualified telephone service available to them.

In order for the GerontoLine to work smoothly, a comprehensive patient record is required⁷, which documents not only clinical issues, but also behavioural, social and family aspects, where a global view of client needs are necessary for this model. Another benefit is the epidemiological assessment instruments which are applied at the first consultation, and repeated annually thereafter, or sooner if a special need arises.

Fee for service

The prevailing hegemonic model for payment of health services in many countries, both within public systems and private health plan market, is the fee-for-service (or pay-for-performance) model. This is characterized by stimulation of competition by users and payment for the number of services delivered

(volume). There is no use changing the payment model⁵⁹ without also changing the care model and vice-versa, since the two are interdependent.

Some of the flaws in the Brazilian health system (especially supplemental services) which largely affect older users are the result of the decades-old model adopted. In order to cater to the new pressing demand from society, alternative models of pay need to be implemented to break the vicious circle of fragmented consultations out of step with the social and health situation of older adults, as well as the ordering of procedures unrelated to the desired outcome⁶⁰.

Performance-related pay is remuneration based on results attained over a given period. Because technical and behavioural standards required of professionals under this model are high, the payment is intended to compensate for this high level of performance.

Fee-for-service has bonus rates as high as 30% on top of base salary for the quarter. Every 3 months, an appraisal of the professional's performance is carried out based on previously established indicators. Given a total of 4 medical consultations per year should be provided under the program criterion, 1 consultation per quarter for every client in the doctor's portfolio is expected.

Professional diligence and good time-keeping are pre-requisites for awarding bonuses and are fundamental for guaranteeing the number of consultations - a key performance indicator for service operation. Another eligibility criterion for the points program for bonus awards is proper registration of information for each patient, including any hospital admissions. These stays constitute the main cost factor, where strict control by the team is key to the economic-financial success of any initiative or project.

Another basic principle is the geriatric doctor's ability to resolve cases. According to international studies³⁸, generalist physicians can resolve 85-95% of their clientele's clinical issues. Referrals to clinical specialties are the exception. If the doctor refers no more than 10% of the clients from their portfolio

within a given quarter, this indicates good case-resolving ability and eligibility for bonus points.

The engagement of users in the program offered by the multidisciplinary team and the institutional Community Centre provides a measure of the bond with the client and of resolute capacity. Hence, an item was included that rates participation of members of each portfolio in consultations with the team gerontologists and in group activities run by the institution's Community Centre contributing further points toward bonus awards.

Medical loss ratio is the main economic-financial indicator for assessing the program, with a commensurately higher weighting attributed to this item, and for which the physician can be awarded up to 2 points on their performance appraisal. The goal is excellence in care provision, so it is only fair to incentivize the professionals as part of the win-win premise..

Other means of rewarding performance include granting time off, book purchases and funding post-graduate courses.

There is no doubt that performance-related pay models will be introduced in Brazil. Professionals in the health sector should start entertaining this notion more as a question of how this will roll out, as opposed to when or whether this will take place^{35,61}.

Therapeutic groups

Therapy groups are a group-based intervention strategy involving patients who have the same condition. Through discussion circles and interactive presentation, participants have the chance to better understand the disease in questions and clear up doubts, representing a self-preventive action.

The duration of these group meetings depends on the subject being addressed. In each shift, 60 minutes are dedicated to this action, convening 5 to 10 participants. Topics discussed are chosen according the actual needs of the portfolio of clients.

Workshop leaders

Workshop leader is the term typically used to refer to the instructors of activities performed daily within the setting of institutional Community Centre. These professionals are gerontologists specialized in their field of practice.

A schedule of weekly activities is offered to the clients, who can choose those which interest them most. Clients can take part in more than one activity, depending on demand.

Comprehensive Geriatric Assessment (CGA)

Assessment of activities of daily living (bathing, toileting, transferring, continence and feeding), instrumental ADLs (using the telephone, shopping, preparing meals, handling medications and finances) and mobility (balance, gait speed and limb strength) can contribute to generate important information for decision-taking, mapping individual protection and risk factors⁶².

The medical-health activities of health education can broaden its focus of attention to encompass positive dimensions of health beyond controlling specific diseases⁶³.

Screening of hearing/vision, and help in management of the use of multiple medications—“polypharmacy” — precedes the detection of problems, contributing to care. Health habits (protective factors) include balanced diet, regular physical exercise, stimulating social interaction, occupational activity and well-being actions in the field of nutrition (cuisine for diabetes and osteoporosis, for example)⁵¹.

Community centres

With the steady growth in the older population, some education programs focused on leisure have been developed. The first Brazilian experience of education for middle-aged and older adults was implemented by the Social Service of Commerce (SESC) in the form of community groups. These

groups emerged in the 1960s running programs centred around leisure activities. These were welfarist in nature in as far as they did not offer the tools needed for subjects to regain the desired autonomy. From the 1980s, universities began to provide educational programs for the older population and for professionals wishing to study aging-related issues, predominantly offering education, health and leisure⁶⁴.

Similar centres had also been set up by health maintenance organizations following the release by the National Agency of Supplemental Health (ANS) of the Care Plan for Older Adults in Supplemental Health. The document sets out incentives to foster a change in the care logic, providing opportunities for health promotion for older adults. A resolution was also published which encourages health plan beneficiaries to take part in active aging programs, in exchange for discounts on their monthly fee^{62,65}.

The setting up community centres is in line with the National Health Policy for the Aged (Regulation no. 2528, of 19th October, 2006). The primary goal is to recuperate, maintain or promote autonomy and independence of older individuals, as well as foster active healthy aging, with encouragement to participate and boost social interaction.

The centre offers a range of activities which contribute to healthy aging, development of autonomy and social interaction, strengthening of family ties, community involvement and prevention of situations of social risk for individuals aged ≥ 60 years⁶⁶. The programs, besides offering physical exercise, feature cognitive training, nutritional programs⁶⁷, telephone services, computing, home security, fall prevention, urinary/faecal continence, immunizations and financial management. Care with mobility of older adults, fall prevention and balance in workshops for psychomotricity, strength training, advice on choice of footwear and podology service, are all important because they help maintain independence⁶⁸.

Aging requires adaptations. New learnings serve as a resource for maintaining functioning and flexibility of older adults⁶⁹. Art, cultural and recreational activities are traditionally associated with community centres for older adults and represent

important sources of pleasure: general knowledge, languages, information technology, composing texts and reading, patchwork art, ballroom dancing, music, card games, dominoes, chess, meditation and sightseeing trips.

As a tool for planning aging, there is the Time Trade-Off questionnaire, which allows a negotiation between the health professional and older individual, considering risk and pleasure.

Many retirees rejoin the job market on a regular or sporadic basis, whether for pleasure or due to necessity, topping up income and stimulating social contact. In the USA, many dedicate time to voluntary projects.

Community centres can provide legal aid services, a caregiver agency and help for the housebound (support for ADLs, remote assistance and meal deliveries etc.). To this end, investment in courses for training caregivers and in communication in the care network is essential.

Also, regularly frequenting workshops allows the older person to experience a routine, which also benefits the caregiver who is freed up to engage in other activities. An annual or six-month “contract” for older adults to attend workshops, as they see fit and subject to the availability of coordinators, facilitates management.

The centres can also provide a forum for discussion of issues affecting the older individual. Aging and end-of-life warrant focus. A practical, light-hearted guide can be devised addressing frequently asked questions in relation to aging (e.g., “what is happening to me?”).

Philosophy and religion can contribute to reflection on aging and death. According to Plato, in Ancient Greece, to philosophize was akin to learning how to die. An idealist, he believed in life after death, regarding one’s demise as a passage, a liberation of the soul. For materialists, however, such as Epicurus, life was finite, making it even more valuable. One cannot live the same way when believing in such different conceptions of death⁷⁰.

End-of-life, palliative care and the way we culturally cope with this stage of life were examined

in a previous study³⁴. Would it be feasible to prepare a practical, yet sensitive, guide presenting some ideas about death? Psychology, based on a discussion about ties, can help toward this task. Letting go of perfect hair colour, eyesight and hearing, letting go of power and memory; allowing decline, accepting the “exoskeleton” (prostheses, hearing aids, glasses, implants.); finding solutions, transforming and refining. Dealing with the fears as a group is fruitful, but older adults are charged with the task of letting go, experiencing loss, saying farewell. Human loneliness is a fact and a necessary one. However, the Community Centre can help to reflect on the meaning of life, every life, by cultivating individual stories in accounts enriched with photos, scenes from films, songs, food recipes, sharing meals etc.

The human journey throughout the life span is a cultural construct that is experienced in a singular fashion. Each phase determines and predicts the possibilities of the next: we age as we live. Flexibility and resilience (ability to cope with events) differs from person to person. The experience of ageing is both heterogeneous and multidimensional, thus calling for singularity also in care plans⁷¹.

When dealing with minor stressor events in daily life, we draw on personal resources, including social resources. The importance of solidarity and sharing experiences is relevant for older adults and those around them. The quality or functioning of social support is more important for adaptation of older adults than the number of people in the network or the frequency of contact⁷². Indeed, the association between social support and self-care supports this notion⁵⁶.

It is through this goal of valorising and respecting old age, fostering an effective embracing approach that Community Centres have found their place based on the premise that whoever works with the perspective of respecting the needs of aged individuals respects their own future.

Birthplace of the model

The model presented was developed within the Open University for the Third Age of the University

of the State of Rio de Janeiro (UnATI/UERJ)²⁴, a centre for studies, education, debates, research and assistance addressing issues inherent to aging, which has contributed to a change in the mindset of Brazilian society regarding its attitudes to older generations. The institution was set up 30 years ago and has gained international recognition as delivering one of the most important health programs for middle-aged and older adults⁶⁸.

This initiative has also garnered international awards and been endorsed by the World Health Organization.

The essential core elements – a summary

Devising a care model for the older population should address and implement a set of measures and actions based on the summarized checklist below:

- a. Doctors should be duly qualified in Family Medicine and Public Health and manage a fixed portfolio of clients;
- b. Institutional community centres are an important area within health clinics, playing a key role as a forum for health education, promotion and preventive actions;
- c. Functional assessment provides correct stratification and allocation of older patients into the appropriate line of care (a number of assessment tools for screening risk are available);
- d. The physician performs clinical management and the nurse acts as care manager, monitoring the health status of users and consolidating the role of contact person for support and strengthening ties;
- e. Besides the generalist doctor specialized in geriatrics and the nurse, the team consists of several gerontologists (e.g. physiotherapist, psychologist, social worker, speech-language therapist, and nutritionist) and workshop leaders (professionals engaged in integrative dynamic activities linked to the community centre program);
- f. The activities run at the community centre help nurture a sense of belonging among clients, and also promote an environment conducive for participation and health education;
- g. Only after the generalist physician has exhausted all efforts to resolve the patient's issue will they refer the case to specialists;
- h. A system of second opinion may also be employed, aiding the doctor to resolve some health problems while averting premature referral to a specialist;
- i. The number of annual medical consultations shall be defined according to the risk and specific needs of the client. It is important to reiterate that care delivery, besides the doctor, involves a nurse, who performs follow-up visits, the gerontologists (in the fields psychology, nutrition, physiotherapy, and physical educator), as well as activities at the institutional community centre. The client and their family will have a substantial number of visits during the course of the year;
- j. In the event of hospital admission, doctors and nurses are in charge of contacting the attending physician at the hospital, available to be briefed on the case, make daily visits and, ideally, seeking to ensure best care with shortest hospital stay;
- k. It is important to ensure that, even if seen at another care facility (hospital), the patient always has their registered doctor.
- l. Use of an epidemiological tool to establish the risk identified after assessment, categorized as robust, at risk of frailty, or frail;
- m. Remote care 24/7 is provided by qualified gerontologists who have access to the client's medical records. This service is called GerontoLine, a unique feature of the model;
- n. The single electronic record compiling users' health information enables individual and group strategies for prevention to be devised;
- o. Low-tech solutions must be deployed for monitoring to make the project feasible;

p Another important feature is the availability of a cell phone app containing individualized information and reminders for appointments and prescribed actions.

The checklist of items outlined above is a summary of the model, which is not doctor-centred, i.e. goes beyond physician visits, and incorporates consultations defined according to patient needs based on risk determined by epidemiological tools. Allied to medical consultations, there are visits with the nurse, paired with the doctor and who, as a dyad, manage 800 clients, treating only low-complexity problems, but representing the point of contact with client and family. The hospital and specialists should be regarded as an exception not the rule. We have nothing against specialists or the hospital, but feel that the practice of these segments is excessive, an area which does not create client trust, leads to higher costs, and confers little or no benefit to the health of this client group.

In this care journey, besides visits by the doctor-nurse dyad, there are the gerontology professionals on the team who receive the clients following referral by this duo. The client's family members are also contacted to provide further information and demonstrate the care provided is comprehensive and not solely disease-centred, encompassing social and behavioural aspects, given that support and assistance from the family is crucial. All actions are logged in a quality electronic record developed for this modality of treatment. These comprehensive records are critical for the professionals in the team and especially for GerontoLine, which provides a remote service around the clock. The GerontoLine responders are trained qualified health professionals and rely on quality information from the patient record in order to take resolute actions. Upon taking a call or message on the app, these professionals have access to the medical record in question and are able to take the most appropriate action. The team also comprises professionals who run the workshops, where a host of different topics are addressed or light-hearted activities performed. In summary, the client and their family have at their disposal a multidisciplinary team of highly-

trained professionals, where the success of "care coordination" is achieved by regular monitoring plus knowledge of the client and their family through the best action and support for the patient's health.

These are the elements to be developed and that will make a difference. In fact, all the content presented to this point discloses nothing majorly new. A similar care model has been in place in the United Kingdom since 1948, and many managers acknowledge this as more efficient, resolute, and lower cost. In modern practice, the clinical management of the most prevalent diseases affecting the older population pursues a doctor-centred approach. We are in favour of good medicine, but recognize that other areas of knowledge should be included and interact in the process of integral health care.

Thus, the overarching aim of this study is to rally for reflection:

1. Why is it that all are in favour of models focused on health prevention and promotion, yet few transform this discourse into practice?
2. Why does an outdated fragmented more expensive and lower quality model persist, when a decades-old tried and tested alternative is available?
3. And why not information, technology, innovation, care quality, bonus awards, performance-related pay, and graduate-level gerontologist team? These key aspects make the difference and cuts costs!

Let us take these measures to heart.

DATA AVAILABILITY

The entire dataset supporting the results of this study is available upon request to corresponding author Renato Peixoto Veras.

CONCLUSION

In recent years, I have been dedicated to researching the integral care of older adults and refinement of care models. In the capacity of Director of the UnATI/UERJ and in my role as

Editor-in-Chief of the *Revista Brasileira de Geriatria e Gerontologia* (RBGG-Brazilian Journal of Geriatrics and Gerontology), beyond mere opinion, I have personally witnessed both the desire and need to consolidate the structuring of the care model for older adults.

I often receive comments of praise, yet, these are invariably tempered by the remark: “what you write is so obvious that maybe this is why it’s so hard to put these ideas into practice”. I tend to agree.

And it is precisely because I realize these reforms are increasingly imperative with each passing year that, that I am again bringing this matter to the attention of academics and opinion leaders in the health sector, because a further dose of medicine is sorely required which, it is hoped, will be able to remedy the present ailing care model.

Population aging is accompanied by new demands, and challenges the traditional care model. Advancements in technology, science and medicine offer those who embrace the modern tools for maintaining health the chance to enjoy life for longer. The social and economic transformations of the last few decades, their consequent shifts in behaviour of contemporary society – changes in eating habits, increased levels of sedentarism and stress – and growing life expectancy of the population, have contributed to higher rates of chronic diseases, posing a major public health problem. The health needs of the older population cannot be satisfactorily met until it is recognized that this stratum of society requires specific care. This makes overhauling the current health model an imperative.

Scrutiny of the national health budget reveals that the vast bulk of funds is dedicated to hospitals and equipment for performing complementary exams. Society and health professionals alike, as a general rule, adhere to a “Hospital-centric” logic, with a mind-set of only treating diseases as opposed to preventing them.

The ideal care model for the older population should be centred on identifying potential risks.

Monitoring health instead of disease will direct investment toward early prevention, resulting in a better chance of rehabilitation and reduced impact on functioning.

As a response to the older population, more actions focused on health promotion and education, the prevention and delaying of disease and frailty, besides maintenance of independence and autonomy, should be implemented.. Lastly, increasing longevity alone does not suffice. It is vital that these additional years can be lived with quality, dignity and wellbeing.

A novel approach to health care that promotes quality of life for users – albeit under the SUS or via the private sector – will entail the use of qualified well-prepared professionals, integrated care, and judicious deployment of information technology. This is the shape that contemporary resolute models advocated by leading national and international health organs should take.

If we age as we live, and where this study foresees the future of the 21st century as “grey”, then an innovative quality care system must be built, because the prevailing outdated care model will only exacerbate the current poor service and healthcare crisis – particularly for older adults, the age group placing the greatest demand and cost on the system. The importance of healthcare, promotion and prevention remains clear, as does the need to deploy technology for consultations, monitoring and information, namely, the “coordination of novel care approaches”. This implementation cannot be deferred as, after all, he who respects the needs of the aged, respects their own future!

AUTHORSHIP

Renato Peixoto Veras – responsible for all aspects of the study, vouching for any issues related to the accuracy or integrity of any part of the study.

Edited by: Luiz Antonio Tarcitano

REFERENCES

1. Veras RP, Ramos LR, Kalache A. Crescimento da população idosa no Brasil: transformações e consequências na sociedade. Rio de Janeiro, Rev. Saúde Pública. Jun. 1987, Rio de Janeiro, 21(3):225-33. <https://doi.org/10.1590/S0034-89101987000300007>
2. Ramos LR, Veras RP, Kalache A. Envelhecimento populacional: uma realidade brasileira. Rev. Saúde Pública, Rio de Janeiro, v. 21, n. 3, p. 211-224, 1987. <https://doi.org/10.1590/S0034-89101987000300006>
3. Kalache A, Veras RP, Ramos LR. O envelhecimento da população mundial: um desafio novo. Rev. Saúde Pública. 1987. Rio de Janeiro: 21, (3): 200-210. <https://doi.org/10.1590/S0034-89101987000300005>
4. Antônio M. Envelhecimento ativo e a indústria da perfeição. Saúde e Sociedade, São Paulo, v. 29, n. 1, p. 1-10, 2020. Disponível em: <https://doi.org/10.1590/S010412902020190967>. Acesso em: 15 nov. 2021.
5. São José J de, Teixeira AN. Envelhecimento Ativo: contributo para uma discussão crítica. Anál. Soc., Lisboa, v. 49, n. 210, p. 28-54, 2014. Disponível em: <http://www.jstor.org/stable/23722984>. Acesso em: 20 nov. 2021.
6. WORLD HEALTH ORGANIZATION. World Population Prospects 2019: Highlights. Summary of Results, Originally published, 19 Jun 2019, New York, 2022.
7. Alves JED. Envelhecimento populacional no Brasil e no mundo. Rev. Longeviver 2019;1:5-9.
8. Veras RP, Estevan AA. Modelo de atenção à saúde do idoso: a ênfase sobre o primeiro nível de atenção. In: Lozer AC, Leles FAG, Coelho KSC (org). Conhecimento técnico-científico para qualificação da saúde suplementar. Brasília, DF: OPAS, 2015. p. 73-84.
9. Moraes EN, Reis AMM, Moraes FL de. Manual de Terapêutica Segura no Idoso. Belo Horizonte: Folium, 2019. 646p.10. SZWARCOWALD, C. L. et al. Percepção da população brasileira sobre a assistência prestada pelo médico. Ciênc. Saúde Colet., Rio de Janeiro, v. 21, n. 2, p. 339-50, 2016. Disponível em: <https://doi.org/10.1590/1413-81232015212.19332015>. Acesso em: 01 nov. 2021.
10. Szwarcwald CL, Damacena GN, Souza Júnior PRB de, et al. Percepção da população brasileira sobre a assistência prestada pelo médico. Ciênc. Saúde Colet. Fev 2016;21(2):339-50. Disponível em: <https://doi.org/10.1590/1413-81232015212.19332015>. Acesso em: 01 nov. 2021.
11. Moraes EN, Moraes FL, Lima SPP. Características biológicas e psicológicas do envelhecimento. Rev. Méd 2010;20(1):67-73. ID: lil-545248
12. Schimidt ML.; Duncan BB; Silva GA; Menezes AM; Monteiro CA.; Barreto SM. Doenças crônicas não transmissíveis no Brasil: carga e desafios atuais. Lancet, London, v. 6736, n. 11, p. 60135- 60139, 2011.
13. World Health Organization. Global status report on noncommunicable diseases 2010. Geneva: WHO; 2011.
14. World Health Organization. Ageing: World Report on Ageing and Health. Geneva: WHO; 2015.
15. Veras RP, Oliveira M. Linha de cuidado para o idoso: detalhando o modelo. Rev. Bras. Geriatr. Gerontol. 2016;19(6): 887-905. <https://doi.org/10.1590/1981-22562016019.160205>.
16. Veras RP. A contemporary care model for older adults should seek coordinated care, grater quality and the reduction of costs. Int J Fam Commun Med. 2019b;3(5):210-14. DOI: 10.15406/ijfcm.2019.03.00159
17. Lima KC, Veras RP, Caldas CP et al. Health Promotion and Education: a study of the effectiveness of programs focusing on the aging process. Int J Health Serv 2017 Jul;47(3):550-70. doi: 10.1177/0020731416660965. Disponível em: <https://doi.org/10.1177/0020731416660965>. Acesso em: 16 nov. 2021.
18. Veras RP. New model of health care improve quality and reduce costs. MOJ Gerontol Ger. 2019a;4(4):117-120. DOI: 10.15406/mojgg.2019.04.00191
19. Caldas CP, Veras RP, Motta LB, et al. Atendimento de emergência e suas interfaces: o cuidado de curta duração a idosos. J. Bras. Econ. Saúde. 2015;7(1):62-69.
20. Veras RP. O modelo assistencial contemporâneo e inovador para os idosos. Rev Bras Geriatr Gerontol. 2022;25(3):1-13. e200061. <https://doi.org/10.1590/1981-22562022025.230065.pt> 2020b.
21. Veras RP. Coordination of care: a contemporary care model for the older age group. MOJ Gerontol. Geriatr 2020a;5(2):50-53. <https://doi.org/10.1590/S0102-311X2005000100002>
22. Carvalho VKS, Marques CP, Silva EN. A contribuição do Programa Mais Médicos: análise a partir das recomendações da OMS para provimento de médicos. Ciênc. Saúde Colet. 2016;21(09):2773-87. <https://doi.org/10.1590/1413-81232015219.17362016>.
23. Veras RP. Caring Senior: um modelo brasileiro de saúde com ênfase nas instâncias leves de cuidado. Rev. Bras. Geriatr. Gerontol. 2018;21(3):360-66. DOI:10.1590/1981-22562018021.180100.
24. Moraes EM organizador. Princípios básicos de geriatria e gerontologia. Belo Horizonte: Coopemed; 2009. 700 p.







25. Veras RP, Caldas CP, Lima KC de, et al. Integração e continuidade do cuidado em modelos de rede de atenção à saúde para idosos frágeis. *Rev. Saúde Pública* 2014;48(2):357-365. <https://doi.org/10.1590/S0034-8910.2014048004941>
26. Saenger ALF, Caldas CP, Motta LB. Adaptação transcultural para o Brasil do instrumento PRISMA-7: avaliação das equivalências conceitual, de item e semântica. *Cad. Saúde Pública*, 2016;32(9):1-7. <https://doi.org/10.1590/0102-311X00072015>.
27. Tanaka OY, Oliveira VE. Reforma (s) e estruturação do Sistema de Saúde Britânico: lições para o SUS. *Saúde Soc.*, 2007;16(1):7-17.
28. Oliveira M, Veras RP, Cordeiro HA et al. A mudança de modelo assistencial de cuidado ao idoso na Saúde Suplementar: identificação de seus postos-chave e obstáculos para implementação. *Physis* 2016;26(4):1383-94. <https://doi.org/10.1590/S0103-73312016000400016>.
29. Geyman JP. Disease management: panacea, another false hope, or something in between. *Ann. Fam. Med* 2007;5(3):257-60. doi: 10.1370/afm.649.
30. Oliveira M. Idoso na saúde suplementar: uma urgência para a saúde da sociedade e para a sustentabilidade do setor. Rio de Janeiro: ANS, 2016.
31. Porter ME, Teisberg EO. Repensando a saúde: estratégias para melhorar a qualidade e reduzir os custos. Porto Alegre: Artmed, 2009.
32. Lima KC, Veras RP, Caldas CP et al. Effectiveness of intervention programs in primary care for the robust elderly. *Salud Pública México* 2015;57(3):265-74. In: Lima KC, Veras RP, Caldas CP et al. *Health Promotion and Education: a study of the effectiveness of programs focusing on the aging process*. *Int J Health Serv* 2017 Jul;47(3):550-70. doi: 10.1177/0020731416660965.
33. Lima-Costa et al. The Brazilian longitudinal study of aging (ELSI-Brazil): objectives and design. *Am. J. Epidemiol*, Tokio, 2018;187:1345-53. Disponível em: <https://doi.org/10.1093/aje/kwx387>. Acesso em: 19 nov. 2021.
34. Veras RP, Gomes JAC, Macedo ST. A coordenação de cuidados amplia a qualidade assistencial e reduz custos. *Rev. Bras. Geriatr. Gerontol* 2019;22(2):1-13. <https://doi.org/10.1590/1981-22562019022.190073>
35. Folstein MF, Folstein SE, McHugh PR. "Mini-mental State". A practical Method for grading the cognitive state of patients for the clinician. *J Psychiatr Res* 1975;12(3):189-98. doi: 10.1016/0022-3956(75)90026-6.
36. Lima-Costa MF, Veras RP. Saúde pública e envelhecimento [editorial]. *Cad. Saúde Pública*, 2003;19(3):700-01. <https://doi.org/10.1590/S0102-311X2003000300001>
37. Castro MC, Massuda A, Almeida J, et al. Brazil's unified health system: the first 30 years and prospects for the future. *Lancet* 2019;394(10195):345-56. doi: 10.1016/S0140-6736(19)31243-7.
38. Turner G, Clegg A. Best practice guidelines for the management of frailty: a British Geriatrics Society, Age UK and Royal College of General Practitioners, report. *Age Ageing* 2014;43(6):744-7. <https://doi.org/10.1093/ageing/afu138>.
39. Veras RP. The Current Challenges of Health Care for the Elderly. *J. Gerontol. Geriatr. Res* 2015b;4(3):1-13. <https://doi.org/10.4172/2167-7182.1000223>. In: Veras RP. *Bem Cuidado: um modelo integrado com ênfase nas instâncias leves de cuidado*. Rio de Janeiro: ANS, 2018a.
40. Machado RSP, Coelho MASC, Veras RP. Validity of the portuguese version of the mini nutritional assessment in brazilian elderly. *BMC Geriatr* 2015;15:132. doi: 10.1186/s12877-015-0129-6.
41. Pedro WJA. Reflexões sobre a promoção do Envelhecimento Ativo. *Kairós* 2013;16(3):1-24. <https://doi.org/10.23925/2176-901X.2013v16i3p9-32>.
42. Veras RP. An Innovative Healthcare Model for the Elderly in Brazil: Care Coordination Extends Care Quality and Reduces Costs. *Int. J. Intern. Med. Geriatr* 2019c;1(2):33-42.
43. Oliveira M de, Veras RP, Cordeiro HA. A importância da porta de entrada no sistema: o modelo integral de cuidado para o idoso. *Physis* 2018;28(4):7-18. <https://doi.org/10.1590/S0103-73312018280411>
44. Chultz MB, Kane AE, Mitchell SJ et al. Age and life expectancy clocks based on machine learning analysis of mouse frailty. *Nat. Commun* 2020;11(4618):1-10. <https://doi.org/10.1038/s41467-020-18446-0>.
45. Rubenstein LZ, Harker JO, Salvà A et al. Screening for Undernutrition in Geriatric Practice: developing the Short-Form Mini Nutritional Assessment (MNA-SF). *J Gerontol A Biol Sci Med Sci* 2001;56(6):M366-72. <https://doi.org/10.1093/gerona/56.6.M366>.
46. Lachs MS, Feinstein AR, Cooney Jr LM et al. A simple procedure for general screening for functional disability in elderly patients. *Ann Intern Med* 1990;112(9):699-706. <https://doi.org/10.7326/0003-4819-112-9-699>
47. Katz S, Ford AB, Moskowitz RW et al. Studies of illness in the aged. The index of ADL: a standardized measure of biological and psychosocial function. *JAMA* 1963;185:914-19. <https://doi.org/10.1001/jama.1963.03060120024016>.

48. Aguiar CF, Assis M. Perfil de mulheres idosas segundo a ocorrência de quedas: estudo de demanda no Núcleo de Atenção ao Idoso da UnATI/UERJ. *Rev. Bras. Geriatr. Gerontol* 2009;12(3):1-14. <https://doi.org/10.1590/1809-9823.2009.00007>.
49. Lawton MP, Brody EM. Assessment of people: self-maintaining and instrumental activities of daily living. *Gerontologist* 1969;9(3):179-186. http://dx.doi.org/10.1093/geront/9.3_Part_1.179
50. Tinetti ME. Performance-oriented assessment of mobility problems in elderly patients. *J. Am. Geriatr. Soc* 1986;34:119-126. <https://doi.org/10.1111/j.1532-5415.1986.tb05480.x>
51. Abicalaffe CL. Pay For Performance Program for Brazilian Private Health Plan. How to Implement and Measure. In: ISPOR, 13., 2008, Toronto. Anais [...]: Toronto: ISPOR, p. 1-10, 2008.
52. Nitrini R, Scaff M. Testes neuropsicológicos de aplicação simples para o diagnóstico de demência. *Arq. Neuropsiquiatr* 1994;52(4):1-10. <https://doi.org/10.1590/S0004-282X1994000400001>
53. Yesavage JA, Brink TL, Rose TL et al. Development and validation of a geriatric depression screening scale: a preliminary report. *J. Psychiatr. Res.* 1992;17(1):37-49. [https://doi.org/10.1016/0022-3956\(82\)90033-4](https://doi.org/10.1016/0022-3956(82)90033-4)
54. Nunes BP, Soares UM, Wachs LS et al. Hospitalização em idosos: associação com multimorbidade, atenção básica e plano de saúde. *Rev. Saúde Pública* 2017;51(43). <https://doi.org/10.1590/S1518-8787.2017051006646>
55. Lima-Costa MF, Barreto SM, Giatti L. Condições de saúde, capacidade funcional, uso de serviços de saúde e gastos com medicamentos da população idosa brasileira: um estudo descritivo baseado na Pesquisa Nacional por Amostra de Domicílios. *Cad. Saúde Pública* 2003;19(3): 735-43. <https://doi.org/10.1590/S0102-311X2003000300006>
56. Veras RP. Bem Cuidado: um modelo integrado com ênfase nas instâncias leves de cuidado. Rio de Janeiro: ANS, 2018a.
57. Guerra ACLC, Caldas CP. Dificuldades e recompensas no processo de envelhecimento: a percepção do sujeito idoso. *Ciênc. Saúde Colet* 2010;15(6):2931-2940. ID: lil-559825
58. Caldas CP, Veras RP, Motta LB da. et al. Models of Approach to Outpatient Older Persons Care. *Sci. J. Public Health* 2014;2(5): 447-53. <https://doi.org/10.11648/j.sjph.20140205.21>.
59. Oliveira M, Veras RP, Cordeiro HA. Supplementary Health and aging after 19 years of regulation: where are we now? *Rev. Bras. Geriatr. Gerontol* 2017;20(5):624-33. <https://doi.org/10.1590/S0102-311X2008000600007>
60. Mendes EV. As redes de atenção à saúde. Brasília, DF: OPAS, 2011. Disponível em: <https://doi.org/10.1590/S1413-81232010000500005>. Acesso em: 17 nov. 2021.
61. Veras RP. Experiências e tendências internacionais de modelos de cuidado para com o idoso. *Ciênc. Saúde Colet* 2012;17(1): 231-37. <https://doi.org/10.1590/S1413-81232012000100025>
62. Ramos LR, Tavares NUL, Bertoldi AD et al. Polifarmácia e polimorbidade em idosos no Brasil: um desafio em saúde pública. *Rev. Saúde Pública* 2016;50(suppl 2):1-10. <https://doi.org/10.1590/S1518-8787.2016050006145>
63. Maia LC, Colares TFB, Moraes EM de et al. Idosos robustos na atenção primária: fatores associados ao envelhecimento bem-sucedido. *Rev. Saúde Pública* 2020;54:1-10. <https://doi.org/10.11606/s1518-8787.2020054001735>
64. Cachioni M. Universidades da terceira idade: das origens à experiência brasileira. In: Neri AL, Debert GG (org). *Velhice e Sociedade*. Campinas: Papirus, 1999, p 141-178. ISBN-13:978-8530805579.
65. Ramos LR, Andreoni S, Coelho-Filho JM et al. Perguntas mínimas para rastrear dependência em atividades da vida diária em idosos. *Rev. Saúde Pública* 2013;47(3):506-13. <https://doi.org/10.1590/S0034-8910.2013047004325>
66. D'orsi E, Xavier AJ, Ramos LR. Trabalho, suporte social e lazer protegem idosos da perda funcional: estudo epidioso. *Rev. Saúde Pública* 2011;45(4):1-10. <https://doi.org/10.1590/S0034-89102011000400007>
67. David HMSL, Riera JRM, Mallebrera AH et al. A enfermeira gestora de casos na Espanha: enfrentando o desafio da cronicidade por meio de uma prática integral. *Ciênc. Saúde Colet* 2020;25(1):1-10. <https://doi.org/10.1590/1413-81232020251.29272019>
68. Veras RP, Caldas CP, Cordeiro HA. Modelos de atenção à saúde do idoso: repensando o sentido da prevenção. *Physis* 2013;23(4): 1189-1213. <https://doi.org/10.1590/1413-81232020251.29272019>
69. Moura, MMD; Veras RP. Acompanhamento do envelhecimento humano em centro de convivência. *Physis* 2017;27(1):19-39. <https://doi.org/10.1590/S0103-73312017000100002>

70. Veras RP, Oliveira M. Envelhecer no Brasil: a construção de um modelo de cuidado. *Ciênc. Saúde Colet* 2018;23(6): 1929-1936. <https://doi.org/10.1590/1413-81232018236.04722018>
71. Veras RP, Galdino AL. *Caring Senior Modelo Assistencial Contemporâneo: Coordenação de cuidado, ampliação da qualidade e redução de custos*. Rio de Janeiro: UnATI/UERJ, 2021.
72. Silva AMM, Mambrini JVM, Peixoto SV et al. Uso de serviços de saúde por idosos brasileiros com e sem limitação funcional. *Rev. Saúde Pública* 2017;51(suppl1):1-10. <https://doi.org/10.1590/S1518-8787.2017051000243>



Low protein intake is associated with mortality in Brazilian older adults

Ângela Maria Natal de Souza¹ 
Dalila Pinto de Souza Fernandes² 
Isah Rabiú³ 
Jérsica Martins Bittencourt¹ 
Juliana Farias de Novaes¹ 
Andréia Queiroz Ribeiro¹ 

Abstract

Objective: To estimate the association between low protein intake and mortality in older adults. **Methods:** Prospective study carried out with 621 older adults in a medium-sized city (Viçosa, Minas Gerais) in Brazil. Protein intake was assessed at baseline (2009) by the usual intake recall and the protein intake classification was used as proposed by the Brazilian Society of Parenteral and Enteral Nutrition. Mortality data were collected in the follow-up period (2009 to 2018) from the Mortality Information System. Cox regression models were applied to estimate the independent association between total protein intake and mortality, and Hazard Ratio estimates and their respective 95% confidence intervals were calculated. **Results:** Among the 621 participants in the study, 52.7% were female, and the prevalence of low protein intake was 60.9%. Over the 9 years of follow-up, there were 154 deaths (23,3%). In the adjust models, older adults with low protein intake showed increased risk of death [HR: 1.72; 95% CI: 1.05 - 2.82]. **Conclusion:** Low protein intake may increase the risk of death in the older adults.

Keywords: Proteins. Aged. Aging. Mortality.

¹ Universidade Federal de Viçosa, Departamento de Nutrição e Saúde. Viçosa, MG, Brasil.

² Universidade Federal de Minas Gerais, Escola de Enfermagem, Departamento de Nutrição. Belo Horizonte, MG, Brasil.

³ Department of Nutrition and Dietetics Hassan Usman Katsina Polytechnic. Katsina state, Nigéria.

This study was carried out with the support of the National Council for Scientific and Technological Development (CNPq) (Pro-adhesion 579255/2008-5). This study was also supported by the Coordination for the Improvement of Higher Education Personnel (CAPES) (Process nº 23038.039412/2008-73) and the Minas Gerais State Research Support Foundation (FAPEMIG) (Process APQ-00594-17).

The authors declare that there is no conflict in the conception of this work.

Correspondence
Ângela Maria Natal de Souza
angela.souza@ufv.br

Received: August 26, 2023
Approved: January 25, 2024

INTRODUCTION

Population aging is evident throughout the world. This scenario reflects achievements, but also involves numerous challenges regarding health because several physiological changes associated with the individual aging process, as well as socioeconomic determinants, can favor worse outcomes such as functional disability, frailty and mortality¹.

In this context, nutrition plays a central role in preventing and controlling health problems². Among nutrients, protein plays an important role in the healthy aging process³ as older adults are more leaning to malnutrition and anabolic resistance in muscle tissue, both related to insufficient levels of this nutrient⁴.

There is evidence that low protein intake is associated with reduced lean mass and the risk of sarcopenia^{5,6}. Sarcopenia is a growing global health problem, affecting 5 to 17% of individuals aged between 60 and 70 years and up to 50% of individuals over 80 years of age⁷. Furthermore, it is related to the occurrence of falls, favoring a reduction in functional capacity and quality of life, as well as higher mortality in older adults⁵. Despite this, few Brazilian studies have focused on the relationship between protein intake and health in the aged population.

Regarding the relationship between protein intake and mortality, international literature shows inconsistencies between study results. One study showed that older adults with higher protein intake had a lower risk of mortality⁸, while another study showed that higher total protein intake was associated with higher all-cause mortality, with vegetable protein intake being inversely associated⁹. As far as it was possible to verify, there are no Brazilian studies on this topic.

Therefore, given the scarce number of studies carried out to date and their inconsistent results, it is important and timely to examine the relationship between low protein intake and mortality in older adults.

METHODS

The present study, with a prospective design, is part of a larger research on health conditions, nutrition and use of medicines by older adults in the municipality of Viçosa, a medium-sized Brazilian city located in the state of Minas Gerais. The eligibility criteria were older adults 60 or over, non-institutionalized and living in the urban and rural areas of the municipality in 2008.

The source population was identified based on a census of the population of older adults aged 60 years and over during the 2008 National Vaccination Campaign, whose vaccination coverage was 80%. From then on, the generated database was complemented with information from the municipality's occupational and health service registry bases, totaling 7980 individuals, who were organized in alphabetical order in the database.

The sample size was calculated considering a 95% confidence level, an estimated prevalence of 50% for different outcomes of interest to the larger project, a tolerated error of 4% and 20% for loss coverage. Based on these parameters, the expected final sample was 670 individuals. Participants were selected by simple random sampling from the previously mentioned database. Other details are described in Nascimento et al. (2012)¹⁰.

Baseline data collection was carried out at the participant's home between June and December 2009. Data were collected through interviews and anthropometric assessments. Seven pairs of previously trained interviewers applied a semi-structured and pre-tested questionnaire covering sociodemographic information, health conditions, lifestyle and nutritional assessment.

In 2018, only death records of older adults participating in the baseline were collected through telephone calls, home visits and by consulting the municipality's Mortality Information System (SIM) databases.

Once the deaths were identified and compared with individual data from the questionnaire, the underlying cause of death was extracted from the SIM database. In cases of older adults not identified in the SIM, participants were contacted via telephone in order to update their survival status. In cases of finding information about death, a visit was scheduled with the family member/guardian of the deceased older adults to obtain information about the date, place of death and basic cause of death by consulting the Death Certificate. Data loss was considered when no information was obtained about the older adult or in the case of moving to Viçosa. The causes of death were classified according to the Tenth Revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10)¹¹.

Daily protein intake was assessed only at baseline, through the application of a habitual intake record, using the multiple passage method¹² and with the aid of a photographic album of food portions. A single interviewer from each pair was previously trained and was responsible for applying the recall in order to promote precision in obtaining information.

The food consumption data described in household measurements were converted into grams (g) or milliliters (mL) after checking the information by the interviewer and a data collection supervisor. The estimation of food consumption and the macronutrient value of the foods consumed was carried out using the DietPro version 5i software. Daily protein intake was analyzed in grams per kilogram of weight (g/kg/day), using the adapted classification of protein intake proposed by the Brazilian Society of Parenteral and Enteral Nutrition (BRASPEN) (2019)¹³: inadequate intake (<1 g/kg/day) and adequate/high (≥ 1 g/kg/day).

Covariates were selected according to the literature. Sociodemographic variables included sex (male, female), age (60 to 69; 70 to 79 and 80 years or more), education (0; <4 years and >4 years of study). Behavioral variables were also collected, such as smoking (never smoked, ex-smoker and smoker) and health conditions such as number of hospitalizations in the last year (none; ≥ 1), number of diseases (<5; ≥ 5). Additionally, the total caloric

value/day was considered. It was calculated from the sum of the macronutrient values; namely, for each 1 g of carbohydrate, proteins and lipids, 4kcal, 4kcal, 9kcal were considered, respectively.

Weight, height, waist circumference and leg circumference were measured for anthropometric assessment^{14,15}. The Body Mass Index (BMI) was calculated as the ratio between weight and height squared and when above 28 kg/m² it was classified as overweight¹⁶. Abdominal obesity was classified by cutoff points for waist circumference values: normal (men <94 cm; women <80 cm) and increased (men ≥ 94 cm; women ≥ 80 cm)¹⁵. Cardiovascular risk was considered when the waist-to-height ratio (WHR) ≥ 0.5 for both sexes¹⁷. Muscle reserve was classified by leg circumference (LC) and considered low for values below 33 cm (women) and 34 cm (men)¹⁸.

The data were presented through descriptive analysis based on measures of absolute and relative frequencies for qualitative variables and measures of central tendency (median) and dispersion (interquartile range, IQR) for quantitative variables. The normality of quantitative variables was assessed using the Shapiro-Wilk test. Mortality was compared according to covariates using Pearson's chi-square test and linear trend chi-square test. Furthermore, a survival curve was generated to evaluate protein intake (inadequate/adequate) according to survival status.

Cox regression models were used to estimate the independent association between total protein intake and mortality, calculating hazard ratio estimates and their respective 95% confidence intervals. The proportionality of risk over time was assessed based on Schoenfeld residuals. Based on the literature and epidemiological and statistical criteria, confounding factors were considered in the models adjusted for variables (sex, age group, education, number of diseases, BMI, LC, smoking and total caloric value).

The analyzes were carried out considering a significance level of 5% to reject the null hypotheses.

The study was conducted in accordance with the principles established in the Declaration of Helsinki and approved by the Research Ethics Committee of the Federal University of Viçosa

(CAAE:69998517.0.0000.5153). All participants signed the free and informed consent form.

DATA AVAILABILITY

The entire dataset supporting the results of this study is available upon request from the corresponding author.

RESULTS

Of the 670 individuals initially planned for inclusion in the study, 621 individuals actually participated, as there were losses due to refusal (n=24, 3.6%), death (n=9, 1.3%), address not located (n=8, 1.2) and moving to another city (n=8, 1.2%). Losses did not differ according to sex and age.

Among the 621 baseline participants in the study, the majority of them (52.7%) were female, 50.7% of them were aged between 60 and 69 years old, and

more than 64.0% of them presented less than four years of education. The prevalence of inadequate protein intake was 60.9%.

For 45 individuals it was not possible to obtain information on survival status, so longitudinal analyzes were performed for 576 participants. Over the 9 years of follow-up (2009-2018), there were 154 deaths (26.7%). Compared to older adults who survived, the majority of non-survivors were aged between 70 and 79 years (39.0%), had less than four years of schooling (70.6%), had a history of one or more hospitalizations (23.4%), self-reported five or more diseases (40.3%) and were classified as having low muscle reserve (39.4%) (Table 1). Furthermore, the frequency of survivors was statistically lower among those with inadequate protein intake (<1.0 g/kg/day) (Figure 1).

According to the Cox regression, older adults with low protein intake had an increased risk of death in both the crude version [HR: 1.44, 95% CI: 1.02 - 2.02] and the adjusted version [HR: 1.72; 95% CI: 1.05-2.82] of the models (Table 2).

Table 1. Survival of older adults according to socioeconomic, behavioral, health and anthropometric characteristics. Viçosa, MG, Brazil - 2009 to 2018.

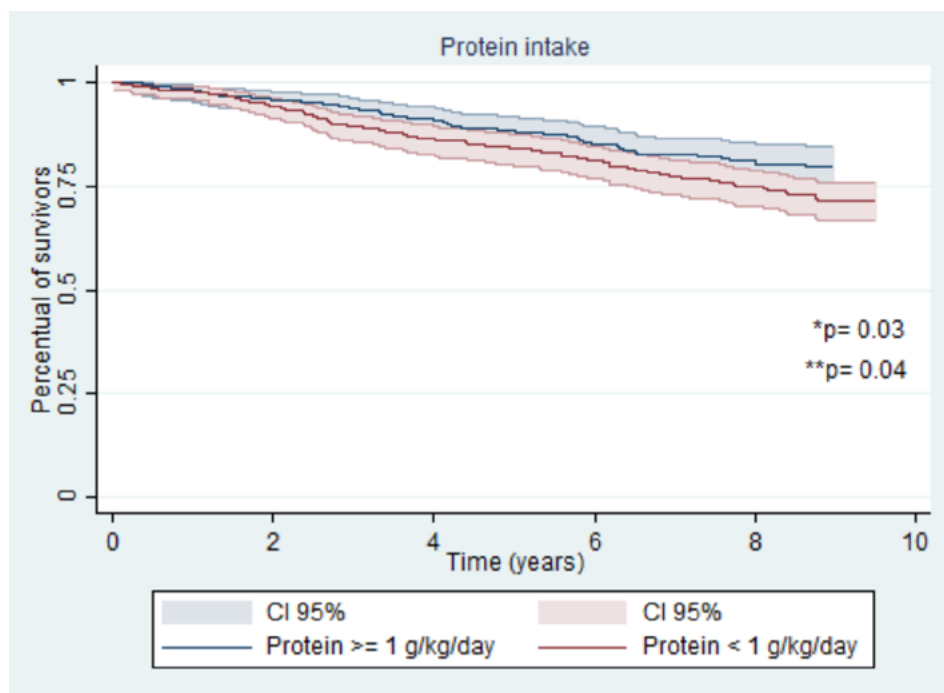
Characteristics	Total	Survivors	Non-Survivors	<i>p</i> value
	n (%)	n (%)	n (%)	
Sex (576)				
Female	272(47.2)	191(45.3)	81(52.6)	0.119*
Male	304(52.8)	231(54.7)	73(47.4)	
Age group (years)				
60 – 69	293(50.9)	252 (59.7)	41(26,6)	<0.001**
70 – 79	197(34.2)	137 (32.5)	60(39.0)	
≥ 80	86(14.9)	33 (7.8)	53(34.4)	
Education (complete years of study)				
0	89(15.5)	63 (14.9)	26(17.0)	0.030**
< 4	372(64.8)	264(62.6)	108(70.6)	
≥ 4	114(19.7)	95(22.5)	19(12.4)	
Cohabitation				0.273*
Only	58(10.1)	46(10.9)	12(7.8)	
Accompanied	518(89.9)	376(89,1)	142(92.2)	
Smoking				
Never smoked	333(58.0)	250(59.2)	83(54.6)	0.630*
Ex smoker	181(31.5)	129(30.6)	52(34.2)	
Smoker	60(10.5)	43(10.2)	17(11.2)	

to be continued

Continuation of Chart 2

Characteristics	Total	Survivors	Non-Survivors	<i>p</i> value
	n (%)	n (%)	n (%)	
Number of hospitalization in the last year				
0	487(84.7)	369(87.6)	118(76.6)	<0.001*
≥ 1	88(15.3)	52(12.3)	36(23.4)	
Number of disease				
<5	415 (72.0)	323(76.5)	92(59.7)	<0.001*
≥5	161(28.0)	99(23.5)	62(40.3)	
Muscular reserve (LC)				
Low	146(25.4)	85(20.1)	61(39.4)	<0.001*
Ideal	430(74.6)	337(79.9)	93(60.4)	
Overweight (BMI)				
Yes	325(65.4)	247(62.4)	78(67.2)	0.338*
No	187(34.6)	149(37.6)	38(32.8)	
Abdominal obesity (WC)				
Increased	415(74.9)	320(76.6)	95(69.1)	0.117*
Normal	139(25.1)	98(23.4)	41(30.1)	
Cardiovascular risk (WHtR)				
Increased	464(91.9)	366(93.1)	98(87.5)	0.054*
Normal	41(9.1)	27(6.9)	14(12.5)	

p-value: * Pearson's chi-square test; ** Chi-square test for linear trend. BMI, body mass index; WC, waist circumference; LC, leg circumference; WHtR, waist-to-height ratio. Missing data for the following variables: education and hospitalizations (1), smoking (2), overweight (64), abdominal obesity (22) and cardiovascular risk (71).



p*=0.03 Log-rank test; *p*=0.04 Peto-Peto Test.

Figure 1. Survival curves (Kaplan Meier) according to protein intake. Viçosa, MG, Brazil - 2009 to 2018.

Table 2. Hazard ratios and 95% confidence intervals for the association between total protein intake and mortality in older adults. Viçosa, MG, Brazil - 2009 to 2018.

Variables	Model 1	Model 2
	Hazard ratio (95%IC)	Hazard ratio (95%IC)
Protein intake (g/kg/day)		
Adequate/high	1.00	1.00
Inadequate	1.44 (1.02 – 2.02)*	1.72 (1.05 – 2.82)*

Model 1: crude model; Model 2: adjusted by age group, sex, education, number of diseases, body mass index, leg circumference, smoking status and total caloric value; * $p < 0.05$. g - grass; Kg - kilogram; CI - confidence interval.

DISCUSSION

The findings of this study suggest that low protein intake among older adults was independently associated with a higher risk of death. This is the first Brazilian study with non-institutionalized older adults to identify this relationship.

Protein intake below the Dietary Reference Intakes (DRI) ($< 0.8 \text{ g/Kg/day}$) can lead to malnutrition, reduce protein synthesis in older adults and cause physical limitations in mobility and coordination¹⁹. Older men with protein intakes below the DRI presented a higher risk of death from cancer compared to those with intakes greater than 1.0 g/kg/day . The authors concluded that, regardless of the protein source (vegetable or animal), low intake is associated with a higher risk of death, especially from cancer in older men²⁰.

A prospective study of 1,998 older adults aged 70 to 79 years over six years found that those with protein intake $< 1 \text{ g/kg/day}$, categorized into protein intake $< 0.70 \text{ g/kg/day}$ (HR: 1.86; 95% CI: 1.41-2.44) and $< 1 \text{ g/kg/day}$ (HR: 1.49; 95% CI: 1.20-1.84), presented an increased risk of limitation in physical mobility compared to those with intake $\geq 1 \text{ g/kg/day}$ ²¹. Another study identified benefits of greater protein intake ($> 1 \text{ g/kg/day}$), with individuals in this group having greater mobility and physical functionality of the lower limbs compared to those with low protein intake ($< 0.80 \text{ g/kg/day}$)²². In general, these results suggest that a higher protein intake can benefit older adults, contributing to improved muscle function and disease prevention, thus improving quality of life²³.

Several factors contribute to lower protein intake in older adults, such as changes in swallowing and appetite, presence of multimorbidities, tooth loss and compromised functional capacity²⁴. Furthermore, polypharmacy is common among older adults²⁵, and some medicines can cause chemosensory disorders²⁵, including hypogeusia (decreased taste) and dysgeusia (distorted sense of taste)²⁶. Consequently, they favor inadequate food consumption.

Additionally, it is known that income and education influence the quality of food consumption, which may compromise adequate protein intake. Due to socioeconomic conditions, for example, there may be a lower consumption of animal proteins among the older adult population, who end up having to buy low-cost foods with lower quality and quantity of proteins²⁷.

The consequences of low protein intake are harmful to the health of older adults. As their age advances, muscle mass is reduced, there is a reduction in postprandial amino acids and muscle uptake of ingested amino acids, which, among other factors, leads to increased protein needs^{28,29}. When these needs are not met, protein-energy malnutrition can occur. This is a frequently identified condition in older adults that can lead to immunodeficiency and morbimortality^{29,30}.

This type of malnutrition causes an initial reduction in the metabolic rate, followed by the production of energy from adipose tissue and, subsequently, protein metabolism occurs, as well as the degradation of muscle tissue, resulting in weight loss³⁰, which favors the occurrence of countless unfavorable outcomes.

The set of these factors highlights the need for individual and collective interventions to guarantee the quality of nutrition for older adults and adequate protein intake for healthy aging.

Policies to promote food and nutritional security focusing on the particularities of population aging are essential. Moreover, nutritional care can focus on guidance on food sources of protein, considering substitute sources as lower-cost options. It is also important to highlight that adequate protein intake encompasses issues of quantity and quality of the protein to be offered, as well as the distribution of these protein sources between meals. This reinforces the importance of nutritional care in the health care in older adults. Finally, the combination of good protein intake with regular physical activity, including resistance exercise, can contribute to the maintenance of muscle mass and strength³¹.

A strength of this study consists of the longitudinal analysis, with control for confounding factors in a representative sample of the older adult population. On the other hand, its main limitation is the fact that protein intake was measured at a single moment, not allowing to infer a causal relationship with mortality. Furthermore, the comparison of low protein intake between studies is compromised due to differences in classification criteria.

Another safeguard must be made regarding the fact that the habitual intake record was used as an instrument for assessing food consumption. Although it is not a validated instrument, it was observed that older adults found it easier to report their usual consumption than their consumption in the last 24 hours³². Furthermore, meals eaten by older adults tend to be monotonous due to issues of habit, as well as difficulties in acquiring, preparing and ingesting food³³. These aspects contribute to minimizing possible biases arising from the application of habitual intake recalls, such as memory bias.

It is worth highlighting that all methods of measuring food consumption have limitations³⁴. In this study, it is believed that the training of interviewers and the restriction to a smaller set of administrators contributed to the quality of the measurements and the reduction of bias.

Another limitation concerns the assessment of muscle reserve, which was carried out by indirect measurement (leg circumference), given the unavailability of more precise methods (such as computed tomography, magnetic resonance imaging, ultrasound and dual-energy x-ray absorptiometry (DEXA)). This may imply a greater likelihood of errors in measurement, especially considering changes typical of aging, such as reduced skin elasticity¹⁸. Furthermore, there may be an overestimation of LC in overweight and obese individuals and significantly lower LC values may be observed in underweight individuals³⁵.

However, anthropometric measurements are widely used in health care for older adults because they are easy to obtain and present good results in predicting different events. As an example, the consensus of the European Working Group on Sarcopenia in Older Adults⁵ recommends the use of anthropometric measurements such as LC when no other methods are available. Finally, it was not possible to adopt the use of leg circumference corrected by BMI. Since the adjusted model includes both BMI and LC, the effect of a possible overestimation in the association between LC and the outcome may have been reduced.

The results of this study suggest that low protein intake may increase the risk of death in older adults. It is necessary to ensure a greater intake of proteins in aging, mainly to maintain lean body mass in order to reduce the risk of death. However, this increase in protein intake must consider the individuality of each older adult, including comorbidities (such as kidney problems) and socioeconomic aspects. Encouraging a healthy diet is a way to ensure an adequate supply of nutrients, including a higher protein intake.

AUTHORSHIP

- Ângela Maria Natal de Souza - study design, data collection, statistical analysis, data interpretation, writing and approving the final version for publication.
- Dalila Pinto de Souza Fernandes - data collection; data interpretation; critical review and approving the final version for publication.

- Isah Rabiú - data interpretation; writing the manuscript and its critical review and approving the final version for publication.
- Jérsica Martins Bittencourt - data interpretation; writing the manuscript and its critical review and approving the final version for publication.
- Juliana Farias de Novaes - data interpretation; writing of the manuscript and critical review and approving the final version for publication.
- Andréia Queiroz Ribeiro - conception and design of the study; data interpretation; writing and critical review and approving the final version for publication.

ACKNOWLEDGMENT

To the entire research project team, the older adults participating in the study and their families.

Edited by: Isac Davidson S. F. Pimenta

REFERENCES







1. Ferreira LF, Silva CM, Paiva AC. Importância da avaliação do estado nutricional de idosos. *Braz. J. Health Rev.* 2020;3(5): 14712 - 20. doi:10.34119/bjhrv3n5-265.
2. Reis SS, Landim LSR. O processo de envelhecimento e sua relação entre sarcopenia, consumo de proteínas e estado nutricional: uma revisão de literatura. *Res. Soc. Des.* 2020; 9(11): e2009119671. doi:10.33448/rsd-v9i11.9671.
3. Houston DK, Nicklas BJ, Ding J, Harris TB, Tyllavsky FA, Newman AB, et al. Dietary protein intake is associated with lean mass change in older, community-dwelling adults: the Health, Aging, and Body Composition (Health ABC) Study. *Am. J. Clin. Nutr.* 2008;87(1):150-5. doi:10.1093/ajcn/87.1.150.
4. Landi F, Calvani R, Tosato M, Martoni AM, Ortolani E, Saveria G et al. Protein intake and muscle health in old age: From Biological Plausibility to Clinical Evidence. *Nutrients.* 2016;8(5):295. <https://doi.org/10.3390/nu8050295>
5. Cruz-Jentoft A.J., Bahat G., Bauer J., Boirie Y., Bruyère O., Cederholm T. et al Cooper C., Landi F., Rolland Y., Sayer A.A. Sarcopenia: Revised European consensus on definition and diagnosis. *Age Ageing.* 2019;48(1):16-31. doi:10.1093/ageing/afy169.
6. Coelho-Junior HJ, Calvani R, Azzolino D, Picca A, Tosato M, Landi F, et al. Protein Intake and Sarcopenia in Older Adults: A Systematic Review and Meta-Analysis. *Int. J. Environ. Res. Public Health.* 2022 Jul 18;19(14):8718. doi:10.3390/ijerph19148718.
7. Yuan S, Larsson SC. Epidemiology of sarcopenia: Prevalence, risk factors, and consequences. *Metabolism.* 2023; 144:155533. doi:10.1016/j.metabol.2023.155533.
8. Kurata H, Meguro S, Abe Y, Sasaki T, Asakura K, Arai Y, Itoh H. Dietary protein intake and all-cause mortality: results from The Kawasaki Aging and Wellbeing Project. *BMC Geriatr.* 2023 Aug 9;23(1):479. doi: 10.1186/s12877-023-04173-w.
9. Chen Z, Glisic M, Song M, Aliahmad HA, Zhang X, Mounmdjian AC, et al. Dietary protein intake and all-cause and cause-specific mortality: results from the Rotterdam Study and a meta-analysis of prospective cohort studies. *Eur. J. Epidemiol.* 2020; 35:411-429. doi:10.1007/s10654-020-00607-6.
10. Nascimento CDM, Ribeiro AQ, Cotta RMM, Acurcio FDA, Peixoto SV, Priore SE, Franceschini SDCC. Factors associated with functional ability in Brazilian older adults. *Arch. Gerontol. Geriatr.* 2012; 54(2):e89–e94. doi:10.1016/j.archger.2011.08.005.
11. Organização Mundial de Saúde. Classificação estatística internacional de doenças e problemas relacionados à saúde. 10. ed. rev. São Paulo: Editora da Universidade de São Paulo; 2009.
12. Valença SE. O Recordatório alimentar habitual para avaliação do consumo alimentar em idosos: desenvolvimento do protocolo de aplicação e validação do conteúdo e de face [dissertação]. Viçosa: Universidade Federal de Viçosa; 2019. [citado em 27 dez. 2023]. Available at: https://www.oasisbr.ibict.br/vufind/Record/BRCRIS_f0bd8b90378d8b61e4f7ff7724c3500d
13. Gonçalves TJM, Horie LM, Gonçalves SEAB, et al. Diretriz BRASPEN de terapia nutricional no envelhecimento. Sociedade Brasileira de Nutrição Parenteral e Enteral (SBNPE). 2019[citado em 22 dez. 2023];34(3). Available at: https://www.braspen.org/_files/ugd/a8daef_13e9ef81b44e4f66be32ec79c4b0fbab.pdf

14. Frisancho AR. New standards of weight and body composition by frame size and height for assessment of nutritional status of adults and the older adults. *Am. J. Clin. Nutr.* 1984; 40(4):808-19. doi:10.1093/ajcn/40.4.808.
15. World Health Organization. Obesity: Preventing and managing the global epidemic. Geneva: 1998. [citado em 22 dez. 2023]. Available at: <https://pesquisa.bvsalud.org/portal/resource/pt/pah-26763>
16. Organização Pan-Americana de Saúde. Pesquisa multicêntrica sobre saúde, bem-estar e envelhecimento (SABE) na América Latina: relatório preliminar. XXXVI Reunião do Comitê Consultivo para Pesquisa em Saúde; 2001. [citado em 22 dez. 2023]. Available at: <https://iris.paho.org/handle/10665.2/45890>
17. Hsieh SD, Yoshinaga H. Is there any difference in coronary heart disease risk factors and prevalence of fatty liver in subjects with normal Body Mass Index having different physiques? *Tohoku J. Exp. Med.* 1995; 177(3):223-231. doi: 10.1620/tjem.177.223.
18. Pagotto V, Santos KF, Malaquias SG, Bachion MM, Silveira EA. Calf circumference: clinical validation for evaluation of muscle mass in the elderly. *Rev. Bras. Enferm.* 2018; 71(2): 322-328. doi:10.1590/0034-7167-2017-0121.
19. Nilsson A, Montiel RD, Kadi F. Impact of meeting different guidelines for protein intake on muscle mass and physical function in physically active older women. *Nutrients.* 2018 Aug 24;10(9):1156. doi:10.3390/nu10091156.
20. Langsetmo LL, Harrison S, Jonnalagadda S, Pereira SL, Shikany JM, Farsijani S et al. Low Protein Intake Irrespective of Source is Associated with Higher Mortality Among Older Community-dwelling Men. *J Nutr. Health Aging.* 2020; 24(8): 900-5. doi:10.1007/s12603-020-1422-4.
21. Houston DK, Tooze JA, Garcia K, Visser M, Rubin S, Harris TB et al. Protein intake and mobility limitation in community-dwelling older adults: the Health ABC Study. *J. Am. Geriatr. Soc.* 2017 Aug;65(8):1705-11. doi:10.1111/jgs.14856.
22. Coelho-Júnior HJ, Milano-Teixeira L, Rodrigues B, Bacurau R, Marzetti E, Uchida M. Relative Protein Intake and Physical Function in Older Adults: A Systematic Review and Meta-Analysis of Observational Studies. *Nutrients.* 2018 Sep 19;10(9):1330. doi:10.3390/nu10091330.
23. Wolfe RR. The role of dietary protein in optimizing muscle mass, function and health outcomes in older individuals. *Br. J. Nutr.* 2012 Aug;108(Suppl 2):S88-93. doi:10.1017/S000711451200259.
24. Bauer J, Biolo G, Cederholm T, Cesari M, Cruz-Jentoft AJ, Morley JE et al. Evidence-based recommendations for optimal dietary protein intake in older people: a position paper from the PROT-AGE Study Group. *JAMDA.* 2013 Aug;14(8):542-59. doi:10.1016/j.jamda.2013.05.021.
25. Correia W, Teston APM. Aspectos relacionados à polifarmácia em idosos: um estudo de revisão. *Braz. J. Dev.* 2020;6(11):93454-93469. doi:10.34117/bjdv6n11-674.
26. Schiffman, SS. Influence of medications on taste and smell. *World J Otorhinolaryngol Head Neck Surg.* 2018 Mar 26;4(1):84-91. doi:10.1016/j.wjorl.2018.02.005.
27. Procópio AF, Fonseca IC, Picoli LT, Mello JF. Deficiência no consumo de proteínas de origem animal no envelhecimento. *Revista Faculdades do Saber.* 2021; 6(13):911-921. [citado em 27 dez. 2023]. Available at: <https://rfs.emnuvens.com.br/rfs/article/view/128>
28. Dourado DAQS, Marucci MFN, Roediger MA, Duarte YAO. Padrões alimentares de indivíduos idosos do município de São Paulo: evidências do estudo SABE (Saúde, Bem-estar e Envelhecimento). *Rev. Bras. Geriatr. Gerontol.* Rio de Janeiro, 2018; 21(6): 756-767. doi:10.1590/1981-22562018021.180092.
29. Malafaia G. A desnutrição proteico-calórica como agravante da saúde de pacientes hospitalizados. *Arq. Bras. Ciên. Saúde.* 2009;34(2):101-7. doi:10.7322/abcs.v34i2.134.
30. Morley JE. Desnutrição energético proteica (DEP). [Internet]. Saint Louis University School of Medicine. 2021 [citado em 27 dez. 2023]. Access in January 2022. Available at: <https://www.msmanuals.com/pt-br/profissional/dist%C3%BArbiotricionais/desnutri%C3%A7%C3%A3o/desnutri%C3%A7%C3%A3o-energ%C3%A9tico-proteica-dep>
31. Voulgaridou G, Papadopoulou SD, Spanoudaki M, Kondyli FS, Alexandropoulou I, Michailidou S, et al. Increasing Muscle Mass in Elders through Diet and Exercise: A Literature Review of Recent RCTs. *Foods.* 2023; 12(6):1218. doi:10.3390/foods12061218.
32. Scagliusi FB, Lancha Júnior AH. Underreporting of energy intake in dietary assessment methods. *Rev. Nutr.* 2003;16:471-481. doi:10.1590/S1415-52732003000400010.
33. Venturini CD, Engroff P, Sgnaolin V, Kik RME, Morrone FB, Silva Filho IG da, et al. Consumo de nutrientes em idosos residentes em Porto Alegre (RS), Brasil: um estudo de base populacional. *Ciênc. Saúde Colet.* 2015; 20:3701–3711. doi:10.1590/1413-812320152012.01432015.

34. Shim J-S, Oh K, Kim HC. Dietary assessment methods in epidemiologic studies. *Epidemiol. Health.* 2014;36:e2014009. doi:10.4178/epih/e2014009.
35. Gonzalez MC, Mehrnezhad A, Razaviarab N, Barbosa-Silva TG, Heymsfield SB. Calf circumference: cutoff values from the NHANES 1999-2006. *Am. J. Clin. Nutr.* 2021 Jun 1;113(6):1679-1687. doi:10.1093/ajcn/nqab029.



Education practices for older women guided by the constructs of Paulo Freire: scope review

Monique de Freitas Gonçalves Lima¹ 
Francisca Márcia Pereira Linhares¹ 
Eliane Maria Ribeiro de Vasconcelos¹ 
Gilson Nogueira Freitas¹ 
Anna Karla de Oliveira Tito Borba¹ 
Laís Helena de Souza Soares Lima¹ 

Abstract

Objective: To map the scientific evidence on educational practices for older women guided by the constructs of Paulo Freire. **Method:** This is a scope review using the methodology of the Joanna Briggs Institute (JBI). The protocol was registered on the Open Science Framework (OSF) platform, DOI: 10.17605/OSF.IO/RP9EV. The search was conducted in the following databases: MEDLINE/PubMed, Web of Science, LILACS, BDENF, SCOPUS, and Cochrane, as well as grey literature available on Google Scholar and the Theses and Dissertations Portal of the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES). The search and screening process took place in August and September 2022. Published studies with full-text available were included without language or time frame limitations. Descriptors and keywords were used, combined with boolean operators OR and AND: Older woman, old woman, aged, aged 60 and over, seniors, older adults, elderly, educational practices, health education, constructs of Paulo Freire, liberating education, Paulo Freire. **Results:** The total number of included studies consisted of 16 publications, predominantly qualitative approaches and experiential reports. The publication years ranged from 1999 to 2021, with languages identified as Portuguese and English. Educational practices were organized following the framework of Paulo Freire, with cultural circles, workshops, and games being the most addressed topics. **Conclusion:** The studies showed that educational practices are participatory and dialogical, and they may contribute to empowering older women in terms of self-care.

Keywords: Health Education.
Women. Aged.

¹ Universidade Federal de Pernambuco – UFPE, Programa de Pós graduação em Enfermagem – PPGENF. Recife, PE, Brasil.

There was no funding for the execution of this work.

The authors declare that there is no conflict in the conception of this work.

Correspondence
Monique de Freitas Gonçalves Lima
monique.freitas@ufpe.br

Received: May 29, 2023
Approved: January 25, 2024

INTRODUCTION

Accompanying the phenomenon of population aging is the process of feminization of aging, whereby the proportion of older adult women surpasses that of older adult men, and in various regions of the world, the female proportion exceeds half of the older population^{1,2}.

Despite their longer life expectancy, women exhibit poorer health quality in old age, primarily due to gender-related disparities throughout their lives that affect access to resources and opportunities, resulting in cumulative negative effects². The aging of the female population is associated with physical decline and an increased risk of functional disability due to the development of chronic diseases. As they age, women also experience more social, financial, and cultural constraints. These constraints affect their quality of life, which often deteriorates over time, posing health risks^{3,4}.

In the pursuit of enhancing the quality of life for older women, it is imperative to develop mechanisms aimed at reducing situations of vulnerability and health risks. Health education interventions, focusing on enhancing quality of life, serve as a means to facilitate health promotion by fostering self-care practices⁵. The use of dialogical, reflective, and problematizing educational practices can constitute transformative educational processes for the development of autonomy among this demographic^{5,6}. Employing methodologies guided by the principles of Paulo Freire enables the exchange of knowledge with the perspective of transforming the world, thereby overcoming oppressions⁵.

Educational practices serve as transformative devices within the social realm to promote the health of individuals and/or communities, guiding individuals towards autonomy and emancipation through critical and reflective thinking. They empower individuals to propose and participate in health decisions, enabling them to care for themselves, their families, and their communities. It is an integral component of healthcare and aims at the shared construction of knowledge regarding the health-illness-care-education process^{7,8}.

The works and thoughts of Paulo Freire, employed in educational practices, emphasize the importance of dialogue, culture, liberating education, and emancipation. They are guided by principles of lovingness, dialogicality, attentive listening, respect for others, altruism, bilateral construction of knowledge, horizontality, autonomy, and consequent empowerment⁶⁻⁸.

The development of critical and reflective thinking enables the unveiling of reality and the proposition of transformative actions. Despite recognizing the importance of Paulo Freire's theoretical foundations for the development of educational practices among older women to promote their health, there is a gap in the literature regarding this topic. Therefore, studies describing how educational practices occur for this audience are necessary. Such information is relevant to the scientific community to guide intervention studies. The study aims to map scientific evidence on educational practices for older women guided by the constructs of Paulo Freire.

METHOD

This is a scoping review with a research protocol registered on the Open Science Framework under the identification: <https://osf.io/grptz>, DOI: 10.17605/OSF.IO/RP9EV, developed and structured based on the recommendations of the review method proposed by the Joanna Briggs Institute (JBI)⁹, following the international PRISMA-ScR guidelines^{9,10}.

To achieve the proposed objective, the following methodological steps recommended by this approach were followed: (1) identify the research question; (2) search for relevant studies; (3) select studies, with two researchers working independently; (4) extract data; (5) separate, summarize, and present a report of results; and (6) disseminate the findings¹¹.

For the construction of the guiding question, the PCC strategy was used, with "P" representing Population – older women, "C" Concept – educational practice, and "C" Context – Constructs of Paulo Freire. Based on this information, the following question was established: How are the evidences

regarding educational practices aimed at promoting health among older women characterized?

Studies available in full text, without language limitations and temporal restrictions, addressing educational practices guided by the constructs of Paulo Freire and applied to older women, were included in this review. The review considered designs of experimental and quasi-experimental studies, analytical observational studies, descriptive observational studies, qualitative studies, and reviews. Excluded were studies that did not address the research question, abstracts published in conference proceedings, editorials, letters to the editor, and duplicates.

The search was conducted in September and October 2022, through remote access to databases, starting from registration on the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES). The search strategy was developed using the Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH) to ensure broad results across databases, composing keywords to expand the search results as needed.

The strategies were applied and adapted for each database: MEDLINE via PubMed, Latin American and Caribbean Health Sciences Literature (LILACS) via the Virtual Health Library (Biblioteca Virtual em Saúde - BVS), Nursing Database (Base de Dados de Enfermagem - BDENF), Scopus, Web of Science (WoS), and Cochrane. Additionally, sources from grey literature were added through Google Scholar and the Theses and Dissertations Portal of the CAPES. The descriptors, crossed with Boolean operators OR and AND, generated the search strategies described in Chart 1.

The publications found were stored and organized in the reference manager Endnote Web® for identification and elimination of duplicates. Subsequently, they were imported into the Rayyan Web® application, where the second stage of duplicate exclusion and blind author-based decision-making on publication retention took place. During this stage, an exploratory reading of titles and abstracts

was conducted independently by pairs of reviewers, assessing studies that were relevant to the research question and objective. Disagreements were resolved through peer consensus and, when disagreement persisted, by the evaluation of a third reviewer. Pre-selected studies were then read in their entirety to assess their content in terms of their contribution to understanding the studied phenomenon and subsequent data synthesis.

For data extraction, a form developed by the authors was utilized, containing the following information: article identification, author, year of publication, objective, study design, participants, main results and conclusions of the studies, educational practice, and the Paulo Freire constructs addressed, followed by a detailed description of the process. This information was organized into two tables, aligning with the scope of this scoping review.

DATA AVAILABILITY

The entire dataset supporting the findings of this study is available upon request from the corresponding author, Monique de Freitas Gonçalves Lima.

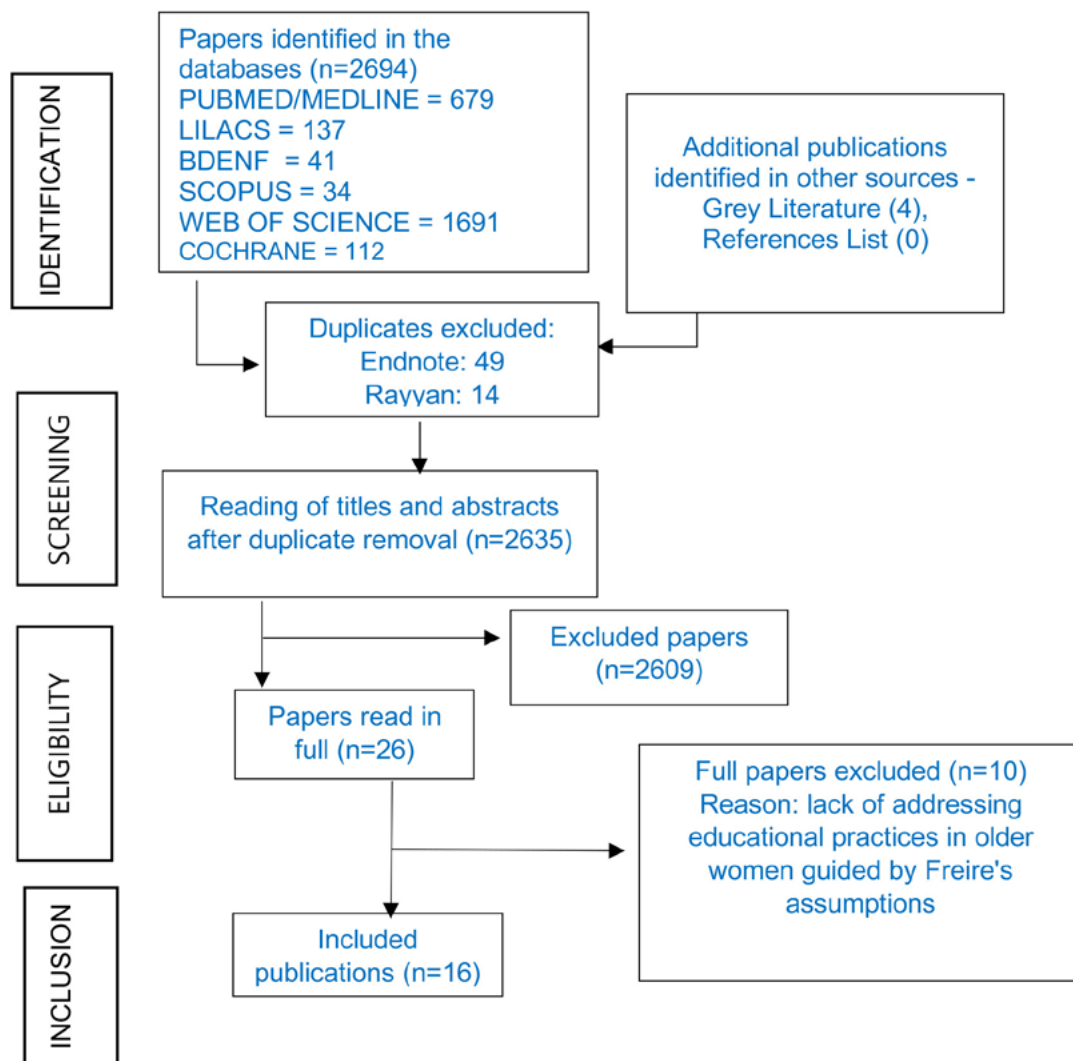
RESULTS

In the initially identified databases, 2,694 articles were found. After removing duplicates, 2,631 articles remained, and an additional 4 studies from gray literature were included, totaling 2,635 studies. Following title and abstract screening, 2,609 articles were excluded for not addressing the theme of this research. Twenty-six publications were selected for full-text reading. Subsequently, 10 were excluded for not addressing educational practices using the framework of Paulo Freire. Additionally, the snowballing search strategy was employed in the references of the selected articles for this review; however, no studies meeting the inclusion criteria were identified. The final sample comprised 16 publications, following the international PRISMA guidelines (Figure 1).

Chart 1. Paper selection strategy. Recife, PE, 2022.

Database	Search strategy
PUBMED/ MEDLINE	(((((aged) or (seniors)) and (educational practices)) or (health education))) and (liberating education) or (paulo freire)
LILACS	(aged) or (seniors) and (educational practices) or (health education) and (liberating education) or (paulo freire)
BDENF	(aged) or (seniors) and (educational practices) or (health education) and (liberating education) or (paulo freire)
SCOPUS	(KEY (“aged” or “aged, 60 and over” or “seniors” or “older and people” or “older and adults” or “elderly”) and KEY (“educational practices” or “health education”) and KEY (“liberating education” or “Paulo Freire”))
WEB OF SCIENCE	old woman and educational practices or health education and Paulo Freire
COCHRANE	aged in title abstract keyword and educational practices in title abstract keyword or health education in title abstract keyword and Paulo Freire in title abstract keyword

Source: Research data (2022).

**Figure 1.** Prisma flowchart adapted from PRISMA-ScR according to the Joanna Briggs Institute⁸. Recife, PE, Brasil, 2022.

Among the 16 articles found, 5 were from the Lilacs database¹²⁻¹⁶, 7 from Scopus¹⁷⁻²³, and 4 from gray literature²⁴⁻²⁷, identified through searches using descriptors and keywords via Google Scholar. The publications were dispersed across the years 1999 to 2021. The predominant language was Portuguese,

with fourteen studies conducted in Brazil and one study in English conducted in Canada¹⁸. Regarding the study designs, qualitative approaches were predominant, primarily anchored in participant observation^{12,14,15,18,21}, followed by experiential reports^{13,23,25,26}, and action research^{17,20} (Chart 2).

Chart 2. Characterization of the studies that made up the sample (n=16). Recife, PE, 2022.

ID*	Author/year/ Study design	Objective	Participants	Main results and study conclusions
1	Alves, 2012 ¹² Qualitative research	Understanding the perspective of users and professionals regarding health groups.	Professionals and 15 users, predominantly female.	Cultural circles (CC) enabled the approximation between professionals and users through dialogue, being perceived as a tool for more participative and emancipatory health practices.
2	Baldissera, 2012 ¹⁷ Qualitative research of the action research type	Exploring the expression of sexuality among older women	Six women with an average age of 67 years	The strategies proposed and supported by Paulo Freire contributed to identifying and reflecting on overcoming the difficulties involving sexuality.
3	Camargo-Plazas, 2020 ¹⁸ Reflective Text	Recommend integrating Cultural circles into the development of Diabetes Self-Management Education programs for older adults.	NA	The CC has contributed to education and empowerment through its emphasis on problem-posing education and mutual collaboration between older adults and healthcare professionals.
4	Gautério, 2013 ¹⁹ Reflective Text	Emphasizing the importance of health education guided by the principles of Paulo Freire, permeating actions aimed at older adult.	NA	Health education can contribute to the development of actions aimed at maintaining the autonomy and independence of older adults, making them aware of decisions regarding their health and capable of self-care.
5	Mendonça et al, 2013 ¹³ Experience Report	Reporting the experience of workshops with older adults as a strategy for health education, in the light of Paulo Freire's thought.	Participation of 20 older adults in four workshops. 80% were female, aged between 60 and 70 years old.	The dialogical space provided by the workshops allowed interaction among the group, the expression of experiences, and the demystification of ideas/concepts regarding the use of medications.
6	Moura e Silva, et al., 2019 ²⁰ Qualitative	Describe the development of educational actions for the prevention and early detection of breast cancer in older women through culture circles.	Thirteen older women	The exchange of experiences facilitated collective learning through the integration of scientific knowledge discussed dynamically and adapted to the reality of the volunteers.
7	Patrocínio e Pereira, 2013 ¹⁴ Qualitative	Assessing the effects of a community-based health education program on older adults' attitudes towards aging.	Sixteen older adults, with fifteen being women.	The interventions may favor the quality of life of older adults and promote a more positive view of aging itself.
8	Portela, 1999 ²¹ Qualitative	Construct an educational process for healthy aging based on cultural health practices.	Rural women up to 63 years old.	Enabled a caregiving/educational process that values the cultural references brought by the clients, considering their differences.

to be continued

Continuation of Chart 2

ID*	Author/year/ Study design	Objective	Participants	Main results and study conclusions
9	Tavares e Rodrigues, 2002 ²² Quantitative-qualitative descriptive study	Identify health education needs and develop appropriate proposals according to the identified needs.	Older adults aged 60 and above, diagnosed with type 2 diabetes mellitus. 76.92% of them are female.	Based on the generative themes within the group, an educational proposal was developed, grounded in Freire's conscientization model, guiding older adults to reflect on the impact of diabetes mellitus on their lives and possible coping strategies.
10	Alencar et al, 2008 ¹⁵ Qualitative	Reflecting on the classroom experiences with older adults from a university of the third age.	Nineteen participants aged between 61 and 79 years old, of whom 17 were female.	Nutritional education, as defined in the tenets of popular education, has been instrumental in catalyzing social debates and policies pertinent to the discourse on contemporary aging.
11	Olympio, 2015 ¹⁶ Qualitative	Implementing games as applied gerontechnology with older adults.	The study highlighted older adults of the female gender (81.25%).	Playful practices facilitated group dialogue, thereby enabling the collective identification and discussion of how each older adult perceives themselves within their family and society, as well as in self-care.
12	Olympio e Alvim, 2018 ²⁴ Qualitative	Developing a board game as gerontechnology aimed at promoting active and healthy aging.	Thirty-one older adults of both genders.	The implemented gerontechnology acted as a playful element, enhancing memory, self-esteem, socialization processes, exchange of experiences, and shared learning.
13	Souza et al, 2021 ²³ Experience Report	Reporting on the experience of a Virtual Culture Circle (VCC), aiming to provide a space promoting health in addressing Covid-19.	Seven Brazilian families were involved, totaling the participation of 21 individuals, ranging in age from 10 to 82 years old.	The development of the VCC facilitated the closeness of the participants, enabling the integration of individuals geographically distant, made possible through a space of welcoming and horizontal dialogue, promoting health.
14	Diogo et al, 2005 ²⁵ Experience Report	Presenting and discussing a health education program for older adults who care for older adults at home.	Eight older adults aged between 56 and 75 years old.	The program enabled better coping with difficulties, understanding the different changes present in old age, and the development of procedures that facilitated interactions with other older adults in day-to-day life.
15	Moura et al, 2010 ²⁶ Experience Report	Describing the profile of older women seeking specialized services and analyzing the health situation with a priority focus on improving the quality of care.	The Conviviality Center accommodates 185 registered individuals. Among this quantity, 180 are women, with an average age of 70 years.	The quality of individual and collective practices contributed to the empowerment of women within the family and community through the Comprehensive Elderly Assistance Program.
16	Pereira et al, 2021 ²⁷ Quantitative-qualitative	Characterizing the profile of older participants in the workshop "Dialogues with those who enjoy reading and writing."	Sixty-six older adults, predominantly women.	The results revealed that the workshop, through culture circles, brought about positive changes, enabling new meanings and feelings of well-being in older adults.

NA: Not Apply, as it represents the practice of professionals. CC: Culture circles. Source: Authors.

The Paulo Freire constructs identified in Chart 3 were: dialogue, problematization, autonomy, respect for the learner, attentive listening, bilateral construction of knowledge, participation, criticality, lovingness, and horizontality. The underlying concepts were critical reflection, conscientization, dialogical relations between educator and learner, and

the transformative nature of education. Regarding educational practices, cultural circles^{12,18,20,23,27}, workshops^{13,15,21,26,27}, the use of interactive games^{16,24}, dialogic exposition¹⁷, collective actions in the community¹⁹, implementation of educational programs¹⁴, and family orientation programs²⁵ were found, with the first three being the most utilized.

Chart 3. Mapping of educational practices guided by Paulo Freire's constructs used by the studies. Recife, PE, 2022.

ID	Author/year	The theoretical constructs of Paulo Freire that guided educational practice	Type of educational practice	Description of the educational practice
1	Alves, 2012 ¹²	Dialogue, horizontality, autonomy, respect for the learner, problematization	Culture circles (CC)	Six CC were conducted across two healthcare units, involving users and professionals, each lasting approximately one hour. Two themes were unveiled as the most significant: unfamiliarity with the concept of group and the methodology utilized within the group.
2	Baldissera, 2012 ¹⁷	Dialogue, autonomy, problematization	Dialogical panel, opinion dynamics, activities referred to as "The Mirror" and "The Photo."	Dialogues and opinion dynamics were conducted on sexuality, encouraging dialogue, reflection, idea exposition, and promoting respect. The "Mirror" dynamics were employed to facilitate recognition of one's own beliefs and values regarding sexuality, while a photo activity was utilized to foster appreciation of self-concept, self-esteem, address aging bodies, and stimulate discussion on beauty.
3	Camargo-Plazas, 2020 ¹⁸	Problematization, dialogue	Culture circles	A self-management education program for older adults with diabetes was proposed, comprising three dialectical phases. Initially, the theme is investigated, followed by the identification of topics related to the identified problems, and in the third phase, participants engage in a process of problematization.
4	Gautério, 2013 ¹⁹	Dialogicity, respect for the learner, and autonomy	Collective actions in the community, group activities, and the involvement of volunteers' social networks.	Reflection was made on the health actions developed by nurses to establish themselves as an effective strategy, which should be directed towards the cultural reality of older adults/learners, addressing the problem from collective thinking, analyzing beliefs, and values about a particular situation.
5	Mendonça et al, 2013 ¹³	Dialogue, problematization, autonomy	Workshops	Participatory methodologies and playful techniques were employed, including individual and group approaches to understand the subjects' reality regarding their use of prescribed medications. Additionally, theater, integration and relaxation dynamics, and the use of handmade materials for crafting medication storage boxes by older adults were utilized, facilitating the development and stimulation of psychomotor coordination.

to be continued

Continuation of Chart 3

ID	Author/ year	The theoretical constructs of Paulo Freire that guided educational practice	Type of educational practice	Description of the educational practice
6	Moura e Silva, et al., 2019 ²⁰	Dialogue, problematization, active listening, bilateral construction of knowledge	Culture circles	Four Culture Circles were conducted. In the first, a dynamic presentation and discussion on the concept of cancer were carried out, prompting the generation of words. The second involved a dialogue on methods of self-care for breast health through self-examination, brainstorming ideas on early detection. The third session included the reading of a fictional story to stimulate critical thinking, while the fourth featured a dynamic activity.
7	Patrocínio e Pereira, 2013 ¹⁴	Autonomy, problematization, dialogue, critical reflection, awareness, dialogical relations between educator and learner; the transformative nature of education	Implementation of a popular education program for older adults.	The program was conducted through weekly meetings lasting approximately 150 minutes, spanning four months. Various thematic areas were selected to be organized within the program, including memory, sleep disorders, physical activity, healthy eating, oral health, emotions and feelings in old age, medication use, health instructions, positive aging image, elder abuse, and therapeutic activities (such as lian gong, tai chi chuan, yoga, massage, and therapeutic clay).
8	Portela, 1999 ²¹	Reflective dialogue, joint reflection-action, nurse and group, respect for popular knowledge.	Workshops	The meetings took place fortnightly, lasting one and a half hours each. They unfolded in four stages: the first involved getting to know the group through data collection; the second identified health cultural practices, resulting in a diagnosis of the situation; the third involved co-constructing new health cultural practices with the group, and the final stage analyzed the process of change in health cultural practices.
9	Tavares e Rodrigues, 2002 ²²	Autonomy, dialogue, participation, critical thinking, respecting their beliefs, feelings, and culture.	Dialogic presentation related to the theme, group discussions, interaction strategies, provision of pamphlets, among other activities.	From interviews with older adults, four themes emerged: Type 2 diabetes mellitus, Health services attention, Associated diseases, The elderly diabetic person. For each theme, general and specific objectives were outlined, the programmatic content to be covered was defined, and teaching strategies were established to be followed.
10	Alencar et al, 2008 ¹⁵	Critical Education, with an emphasis on Paulo Freire's problematizing pedagogical conception regarding aspects of conscientization, liberation, transformation of individuals, and humanization.	Workshops were conducted, and educational materials were used.	Classes were taught over thirty-one sessions, each lasting two hours. Programmatic activities were developed using the following teaching techniques: points of reflection and debate; oral communication; sharing experiences; group work; group dynamics; practical activities; reading short texts, magazine and newspaper articles, as well as relaxation techniques using music.

to be continued

Continuation of Chart 3

ID	Author/ year	The theoretical constructs of Paulo Freire that guided educational practice	Type of educational practice	Description of the educational practice
11	Olympio, 2015 ¹⁶	Dialogue, Problematization	Four games were recreated: board game, memory game, puzzle, and bingo.	The data were produced through individual interviews, group discussions, and participant observation. The research development stages included: sensitization of older adults regarding the study, individual interviews, meetings with convergence groups for discussion and implementation of gerontechnology, and evaluation of the entire process.
12	Olympio e Alvim, 2018 ²⁴	Dialogue, Problematization	Board game	The study was divided into 3 stages, and the board game was introduced to older participants during the third meeting with each group. The game consists of six pieces representing older adults, twenty-one cards coordinating the dynamics among participants, and a game board with the rules.
13	Souza et al, 2021 ²³	Loving-kindness, dialogicity, attentive listening, horizontality	Virtual Culture Circle (VCC)	The Virtual Culture Circle was conducted during the quarantine period. The stages of the Research Itinerary were carried out by analogy with the construction of a house, which relies on all its structures to remain erected. A puzzle was organized to build the house, aiming to make the discussion about coping with Covid-19 more interactive and dialogical.
14	Diogo et al, 2005 ²⁵	The educational action was grounded in the experiences lived by the subjects, as well as autonomy and problematization.	Program for guidance to relatives of frail older adults	The "Orientation Program for Relatives of Frail Older Adults" was developed, providing assistance to the families of this demographic for home care. Various topics were addressed according to the group's needs, employing audiovisual resources and strategies such as problematization and experiencing the lives of older adults, free drawing, oral exposition, and practical activities.
15	Moura et al, 2010 ²⁶ .	Elaborated and developed in the light of Paulo Freire's Problem-Posing Pedagogy.	Workshops	Several working groups were established in response to the demands presented, such as literacy workshops, expressive self-activity groups, debate cycles, informative and reflective groups, memory and creativity workshops, dance experiencing groups, handicraft workshops, among others.
16	Pereira et al, 2021 ²⁷	Dialogue, Problematization, Autonomy	Workshops and Cultural Circles	The workshops took place through Cultural Circles and compared the neuropsychological abilities of older participants at the beginning and end of the workshop. Permanent education practices aimed at an audience of educated older adults, within Paulo Freire's perspective of Cultural Circles, contributed to the improvement of neuropsychological functioning and response times to daily challenges.

CC: Culture circles. Source: Authors.

DISCUSSION

Among the educational practices identified in studies that utilized the constructs of Paulo Freire, participatory methodologies permeated by playful activities stood out. Group activities such as circles of culture, workshops, and the use of interactive games were widely employed among older women. Additionally, collective actions in the community, implementation of educational programs, dialogic exposition, and orientation programs for family members were observed. During the educational actions, the use of assumptions employed by Paulo Freire seeks to raise awareness and politicize individuals as they problematize their reality and rediscover themselves as instigators of their experiences. When this process occurs in health education, its purpose is to promote social inclusion, particularly of more vulnerable groups such as older adults, encouraging these individuals to make decisions regarding topics that can improve their quality of life^{6,28,29}.

One of the educational practices utilized was the Cultural Circle, which represents a dynamic space for learning and knowledge exchange, where individuals gather in the educational process to investigate topics of interest to the group itself. It allows for the establishment of a dialogue relationship between the social actors of research and researchers²⁹. Thus, the use of Freire's constructs reveals the social reality experienced by the analyzed group, enabling the expansion of generated reflections and leading to new proposals for action on everyday life, aiming to promote the health of those involved^{30,31}.

The cultural circles applied in the studies^{12,18,20,23} addressed topics such as health groups, self-management of diabetes mellitus, breast cancer, and Covid-19. They were conducted in different ways according to the local reality and health situation, as in the case of the Covid-19 topic²³, which allowed for the development of virtual cultural circles. This practice allowed for the closeness of users with healthcare professionals by addressing topics of collective interest, promoting the empowerment and autonomy of the audience.

Other practices that utilize Freire's constructs for equivalent purposes include collective actions¹⁹,

educational and orientation programs¹⁴, dialogic exposition^{17,22}, and workshops^{13,15,21,26}, which provide the sharing of information, experiences, and relevant insights, benefiting not only older women but also the healthcare professionals who implement them.

The implementation of these practices among older adults implies a reconsideration of the autonomy of this population. When directed towards the construction of a new conception of knowledge, it emerges as a predictor of quality of life in old age and the aging process. It is necessary to promote a shift in paradigms in old age, offering older women a transformation of their lives towards awareness, liberation, emancipation, and autonomy³².

Among the practices, the educational strategy of the circle of culture has shown positive outcomes in the learning process regarding chronic diseases (CD) and in stimulating the participation of older adults, thereby expanding their decision-making capacity regarding treatment^{18,20}. Additionally, it can assist in reducing the impacts caused by CDs on morbidity and mortality, aligning with the United Nations Sustainable Development Goal (SDG) of reducing premature mortality from non-communicable diseases^{29,20}.

The educational practices were carried out by healthcare professionals in communities or within healthcare services, involving service users, and were executed in different ways. They addressed topics such as cultural health practices, literacy workshops, memory and creativity workshops, medication use, nutrition, and Health and Aging. The implementation of these practices enables the appreciation of cultural references brought by older women through the caregiving/educating process, allowing interaction within the group, expression of experiences, respecting their integrity, and providing cultural, leisure, and educational activities^{13,15,21,26}.

A proposal for educational practices with the older population that has stood out in recent years is the use of games. Board games, memory games, puzzles, and bingo were identified^{16,24}. The use of games with older adults can provide a playful resource with the expectation of enhancing cognitive functions, socialization, dialogicity, and knowledge acquisition, positively impacting their health^{16,24}.

This educational resource leads to collective participation, enabling interaction, reflection, and apprehension of shared information. It contributes to raising awareness among older adults regarding their limitations and possibilities in the aging process, allowing for better adherence to treatments and the maintenance of functional capacity for a longer period^{25,33-36}. However, there is a lack of studies applying these technologies specifically to older women.

In regard to the study design, this review observed a predominance of qualitative studies. This method allows for the capture of valuable information concerning individuals' experiences and needs in specific contexts, facilitating the comprehension and interpretation of meanings. When seeking to understand the educational practices developed with older adults, the qualitative method has been the most utilized³⁶. This method, combined with educational practices using the theoretical framework of Paulo Freire, can contribute to a self-care practice tailored to the reality of individuals^{5,7,37,38}.

The perspective of healthcare professionals in educational practices, according to Freire's principles, should prioritize actions aimed at fostering autonomy and self-care among individuals regarding their health. These actions should occur in a horizontal manner, not limited to the technical scientific knowledge held by the educator, but primarily through the encouragement of developing competencies within that population to address the challenges that arise with the aging process.

In this regard, considering education for and with older women has become a challenge. Alongside this issue, there is the proposal to devise educational practices that are simultaneously problematizing, ongoing, and transformative, capable of providing the necessary tools for older adults to participate and intervene in decision-making processes regarding their own lives and their collective existence³⁷⁻³⁹.

The primary gap identified in this review was the limited literature production on the subject. However, this study, by allowing the identification of educational practices for older adults, aids healthcare professionals in selecting the most appropriate ones. Furthermore, it may contribute to the quality of life by offering dialogical, reflective, and problematizing devices

tailored to their realities. As a limitation, it may not have encompassed all the evidence regarding practices, as it included only the studies available in full.

CONCLUSION

This scoping review enabled the mapping of evidence regarding educational practices for older women guided by the constructs of Paulo Freire. Circles of culture, workshops, and the use of games emerged as highlighted strategies utilized in these educational practices. These actions were guided by dialogical, problematizing, and emancipatory approaches, configuring themselves as innovative health promotion strategies.

The study provides results that offer healthcare professionals opportunities for choosing and developing educational practices aimed at improving the quality of life for older women. Thus, it is necessary to develop communicative processes between the healthcare team and the users, producing strategies that strengthen their autonomy and independence. In this perspective, the epistemological conceptions of Paulo Freire can underpin educational practices with older women.

It is evident from the literature found that educational practices are participatory and dialogical, and they can contribute to empowering older women in self-care. It is essential to develop further studies using educational practices planned according to the specificities of older women, aiming for better outcomes in promoting care for this population.

AUTHORSHIP

- Monique de F. G. Lima - data analysis and interpretation, paper writing, approval of the version to be published, and overall responsibility for all aspects of the work.
- Francisca M. P. Linhares - data analysis and interpretation, paper writing, and approval of the version to be published.
- Eliane M. R. de Vasconcelos - data analysis and interpretation, and approval of the version to be published.

- Gilson N. Freitas - data analysis and interpretation, and approval of the version to be published.
- Anna Karla de O. T. Borba - data analysis and interpretation, and approval of the version to be published.
- Laís Helena de S. S. Lima - data analysis and interpretation, and approval of the version to be published.

Edited by: Yan Nogueira Leite de Freitas

REFERENCES

- Oliveira FA, Lima AF de, Santiago AB, Moura D de JM, Guedes MVC, Coelho M de MF. A prática de atividades lúdicas para promoção da saúde à pessoa idosa: uma experiência com oficinas educativas. *Rev APS [Internet]*. 2021 [access: March 28, 2023]; 23(4). Available at: <https://periodicos.ufjf.br/index.php/aps/article/view/16724>
- Silva Sousa NF, Lima MG, Cesar CLG, de Azevedo Barros MB. Active aging: Prevalence and gender and age differences in a population-based study. *Cad Saude Publica [Internet]*. 2018 [access: March 28, 2023]; 34(11):e00173317. Available at: <https://www.scielo.br/j/csp/a/CgHpmyrd4pDy3yq5dMLmLbs/>
- Cepellos VM. Feminization of aging: a multifaceted phenomenon beyond the numbers. *Rev Adm Empres [Internet]*. 2021 [access: March 28, 2023]; 61(2):1-7. Available at: <https://www.scielo.br/j/rae/a/9GTWvFfzYFzHKyBhqGPc4j/>
- Alvaro SSS de O, Mello LA de, Bernardo LD, Raymundo TM. Navegando em ondas virtuais: barreiras e facilitadores para a inclusão digital de idosos. *Res Soc Dev [Internet]*. 2022 [access: March 29, 2023]; 11(9):e19111931685. Available at: <https://rsdjournal.org/index.php/rsd/article/view/31685>
- Abreu MA, Soares FD de S, Carvalho DP de SRP. Contribuições de Paulo Freire para o ensino em saúde: uma revisão integrativa. *Rev Temas em Educ [Internet]*. 2021 [access: March 29, 2023]; 30(3):141–56. Available at: <https://periodicos.ufpb.br/index.php/rteo/article/view/59991>
- Freire, P. *Pedagogia do Oprimido*. 43ª Ed. Rio de Janeiro: Paz e terra, 2006.
- Nemer CRB, Silva MP da, Santos ISR, Ferreira LD, Flexa R dos S, Teixeira E. Freireanas categories in nursing undergraduate education: integrative literature Review. *Rev Pesqui Cuid é Fundam Online [Internet]*. 2020 [access: March 29, 2023]; 1157–64. Available at: http://seer.unirio.br/index.php/cuidadofundamental/article/viewFile/8023/pdf_1
- Antonini FO, Heideman ITSB. Paulo Freire's research itinerary: contributions for promoting health in the teaching profession. *Rev Bras Enferm [Internet]*. 2020 [access: March 29, 2023]; 73(4):e20190164. Available at: <https://www.scielo.br/j/reben/a/C6dx6SyfFgm9txBfTnWcDhh/?lang=en>
- Peters MD, Godfrey C, McInerney P, Baldini SC, Khalil H, Parker D. Scoping Reviews. In: Aromataris E, Munn Z, editors. *Joanna Briggs Institute Reviewer's Manual*. Austrália: The Joanna Briggs Institute; 2017.
- Joanna Briggs Institute (JBI). *Reviewer's manual: 2015 edition/supplement*. Austrália: JBI; 2015.
- Peters MD, Godfrey CM, Khalil H, McInerney P, Parker D, Soares CB. Guidance for conducting systematic scoping reviews. *Int J Evid Based Healthc*. 2015;13(3):141-6.
- Alves LH de S, Boehs AE, Heidemann ITSB. Family health strategy professionals and users' perception on health promotion groups. *Texto e Context Enferm [Internet]*. 2012 [access: March 30, 2023]; 21(2):401–8. Available at: <https://www.scielo.br/j/tce/a/Jc7vRdKrPqkxJKG3RctDDzD/?lang=pt>
- Mendonça ET, Fernandes L, Aires A, Amaro MO, Moreira TR, Henriques BD, et al. A experiência de oficinas educativas com idosos: (Re) pensando práticas à luz do pensamento Freireano. *Rev APS [Internet]*. 2013 [access: March 30, 2023]; 16(4):479–84. Available at: <https://periodicos.ufjf.br/index.php/aps/article/view/15199>
- Patrocínio WP, Pereira B da P da C. Efeitos da educação em saúde sobre atitudes de idosos e sua contribuição para a educação gerontológica. *Trab Educ e Saúde [Internet]*. 2013 [access: March 29, 2023]; 11(2):375-394. Available at: <https://www.scielo.br/j/tes/a/rKF9t3hYRSzqFgMtj9yvVnm/>
- Alencar MDSS, Barros FDO, Resende Gonçalves De Carvalho CM. Os aportes sócio-políticos da educação nutricional na perspectiva de um envelhecimento saudável. *Rev Nutr [Internet]*. 2008 [access: May 02, 2023]; 21(4):369–381. Available at: <https://www.scielo.br/j/rn/a/kn3HWwdjtjBnznWdh3Ly5Xk/abstract/?lang=pt>

16. Olympio PCAP. Gerontotecnologia na enfermagem: o emprego de jogos na educação em saúde com idosos sobre envelhecimento ativo e saudável. / Paula Cristina de Andrade pires Olympio. –Rio de Janeiro: UFRJ/EEAN, 2015.
17. Baldissera VDA, Bueno SMV, Hoga LAK. Aperfeiçoamento da sexualidade de mulheres idosas por meio da educação emancipatória. *Health Care for Women International*. 2012, 33 (10), 956-972.
18. Camargo-Plazas P, G. Costa I, Alvarado B, Duhn L, Tregunno D. Adapting Paulo Freire's Participatory Education to Develop Self-Management Education Programs for Seniors With Diabetes. *Can J Diabetes* [Internet]. 2021 [access: May 02, 2023]; 45(6):575–8. Available at: <https://pubmed.ncbi.nlm.nih.gov/33308983/>
19. Gautério DP, Vidal DAS, Barlem JGT, Santos SS. Action by nurses to educate older adults: the family health strategy. *Rev Enferm UERJ*. 2013 [access: May 04, 2023]; 21(2):824–8. Available at: <https://www.publicacoes.uerj.br/enfermagemuerj/article/view/12302/9581>
20. Moura E Silva ÁD, Barbosa ICFJ, Nery IS, Luz NSA, Fernandes AFC. Health education of elderly women's breasts by circles of culture. *Cult los Cuid* [Internet]. 2019 [access: May 04, 2023]; 23(53):330–9. Available at: <http://dx.doi.org/10.14198/cuid.2019.53.31>
21. Portella MR. Caring for healthy aging: building an educational process with rural women. *Rev Bras Enferm* [Internet]. 1999 [access: May 04, 2023]; 52(3):355–64. Available at: <https://www.scielo.br/j/reben/a/9L3fdTgfpFGXpdbKhnR7k3L/?lang=pt>
22. Tavares DM dos S, Rodrigues RAP. Educação conscientizadora do idoso diabético: uma proposta de intervenção do enfermeiro. *Rev Esc Enferm USP* [Internet]. 2002 [access: May 04, 2023]; 36(1):88–96. Available at: <https://www.scielo.br/j/reusp/a/pvGc5qBfkr8V9hspXmmKykj/abstract/?lang=pt>
23. Souza JB, Heidemann ITSB, Massaroli A, Geremia DS. Health promotion in coping with COVID-19: a Virtual Culture Circle experience. *Rev Bras Enferm*. 2021;74.
24. Olympio PC de AP, Alvim NAT. Board games: gerotechnology in nursing care practice. *Rev Bras Enferm* [Internet]. 2018 [access: May 04, 2023]; 71 2:818–26. Available at: <https://www.scielo.br/j/reben/a/D6WJPncXg4K8DLXBYHrS6Cz/?lang=pt>
25. Diogo MJDE, Ceolim MF, Cintra FA. Teaching program for elderly women who care for elderly relatives in their home: report of experience. *Rev Esc Enferm USP* [Internet]. 2005 [access: May 05, 2023]; 39(1):97–102. Available at: <https://www.scielo.br/j/reusp/a/WwPQLpRzgy6SYHBTnPhPHJP/>
26. Moura MAV, Domingos AM, Rassy ME de C. A qualidade na atenção à saúde da mulher idosa: um relato de experiência. *Esc Anna Nery* [Internet]. 2010 [access: May 04, 2023]; 14(4):848–55. Available at: <https://www.scielo.br/j/ean/a/S3Brx55Bx66QJPWPrK8S4Bm/>
27. Pereira DDA, Todaro MDÁ, Cachioni M. Educação permanente e o círculo de cultura freireano: diálogos com idosos. *Ideação* [Internet]. 2021 [access: May 05, 2023]; 24;23(2):46–64. Available at: <https://saber.unioeste.br/index.php/ideacao/article/view/26624>
28. Souza EM, Silva DPP, de Barros AS. Popular education, health promotion and active aging: An integrative literature review [Internet]. Vol. 26, *Ciência e Saúde Coletiva*. ABRASCO - Associação Brasileira de Saúde Coletiva; 2021. p. 1355–68. Available at: <https://www.scielo.br/j/csc/a/gKNHyg95H4SQgKQ3hxnzNZx/>
29. Rodrigues ST, De Paula SF, Pedroso VSM, Cecagno D, Nunes S dos S, De Siqueira HCH. Práticas educativas na sala de espera de uma unidade básica de saúde. *Res Soc Dev* [Internet]. 2020 [access: May 05, 2023]; 24;9(5):e14952392. Available at: <https://rsdjournal.org/index.php/rsd/article/view/2392>
30. Durand MK, Heidemann ITSB. Quilombola women and Paulo Freire's research itinerary. *Texto e Context Enferm*. 2020 [access: May 05, 2023]; 29:1–13. Available at: <https://doi.org/10.1590/1980-265X-TCE-2018-0270>
31. Santos PA dos, Heidemann ITSB, Marçal CCB, Arakawa-Belaunde AM. A percepção do idoso sobre a comunicação no processo de envelhecimento. *Audiol - Commun Res* [Internet]. 2019 [access: May 05, 2023]; 6;24:e2058. Available at: <https://www.scielo.br/j/acr/a/WkNqN959jCrJkP8yPntdT5k/abstract/?lang=pt>
32. Pereira DDA, Todaro MDÁ, Cachioni M. EDUCAÇÃO PERMANENTE E O CÍRCULO DE CULTURA FREIREANO: DIÁLOGOS COM IDOSOS. *Ideação* [Internet]. 2021 [access: May 07, 2023]; Jun 24;23(2):46–64. Available at: <https://saber.unioeste.br/index.php/ideacao/article/view/26624>
33. Munhoz OL, Ramos TK, Moro B, Timm MS, Venturini L, Cremonese L, et al. HEALTH BINGO WORKSHOP: AN EDUCATIONAL EXPERIENCE IN HEALTH WITH ELDERLY GROUPS. *REME Rev Min Enferm* [Internet]. 2016 [access: May 07, 2023]; 20:e-968. Available at: http://www.revenf.bvs.br/scielo.php?script=sci_arttext&pid=S1415-27622016000100504&lng=pt&rm=iso&tlng=pt

34. Cordeiro JR, Fadel LM. Jogos Digitais para Idosos— uma experiência de ensino. Seminário de Jogos Eletrônicos, Educação e Comunicação, 2019.
35. Pires AK, Nunes ID. O uso de jogos digitais pela pessoa idosa: suas vantagens e consequências. *Rev Longeviver* [Internet]. 2022 [access: May 07, 2023]; 16. Available at: <https://revistalongeviver.com.br/index.php/revistaportal/article/view/990>
36. Lucca DC, Hammerschmidt KS de A, Gironi JBR, Fernandez DLR, Carvalho AA de, Rosa S dos S, et al.. Game of Attitudes: educational gerontotechnology for the elderly undergoing haemodialysis. *Rev Bras Enferm* [Internet]. 2020 [access: May 07, 2023]; 73:e20180694. Available at: <https://doi.org/10.1590/0034-7167-2018-0694>
37. Oliveira PA, Santos PMF, Alves FR, Garcia LAA, Malaquias BSS, Santos AS. Educação permanente e práticas educativas para o idoso: revisão integrativa. *Rev Recien - Rev Científica Enferm* [Internet]. 2021 [access: May 07, 2023]; 22;11(36):626–47. Available at: <https://www.recien.com.br/index.php/Recien/article/view/548>
38. FREIRE P. Pedagogia da autonomia: saberes necessários à prática educativa. Editora Paz e terra, 2014.
39. Seabra CAM, Xavier SPL, Sampaio YPCC, Oliveira MF de, Quirino G da S, Machado M de FAS. Health education as a strategy for the promotion of the health of the elderly: an integrative review. *Rev Bras Geriatr e Gerontol* [Internet]. 2019 [access: May 10, 2023]; 24;22(4):e190022. Available at: <https://www.scielo.br/j/rbagg/a/xmDgQQxDN4gPRWgTQHysZXn/?lang=en>




Desire and will of institutionalized older adults regarding end-of-life terminality


Fabiane Marzari Possatti¹ 

Silvana Bastos Cogo¹ 

Nara Marilene Oliveira Girardon Perline¹ 

Larissa Venturini² 

Marinês Tambara Leite³ 

Cenir Gonçalves Tier⁴ 

Abstract

Objective: The present study aimed to explore the desires and wishes of older adults residing in Long-Term Care Facilities (LTCFs) regarding end-of-life terminality. **Method:** This was a descriptive and exploratory qualitative research, involving 18 older adults from two LTCFs in a city in the central region of the state of Rio Grande do Sul (RS), Brazil. Data collection took place from March to May 2022 through semi-structured interviews and using the "cards on the table" technique. The data were subjected to discursive textual analysis. **Results:** Five categories emerged: Family welcoming and acceptance: death in LTCFs or at home and the fear of dying alone; End-of-a-life cycle: a moment of personal reflection, farewell, affection, and faith; Preservation of the human dignity of older adults who are institutionalized in the terminal phase of life; Not being pressured and not being a burden to the family: desires related to the actions of professionals and family members toward the older adult; and Maintenance of senses and awareness of death: desire for a beneficial experience with pain control, purification, and surrendering of life through faith. **Conclusion:** The desires and wishes expressed were related to broad aspects of life. Understanding these desires has emerged as an opportunity for healthcare professionals to introduce topics related to finitude, allowing these older adults to have their voices heard, felt, and respected.

Keywords: Death. Attitudes towards death. Long-Term Care Facilities for older adults. Aged. Nursing.

¹ Universidade Federal de Santa Maria, Programa de Pós Graduação em enfermagem. Santa Maria, RS, Brasil.

² Universidade Federal de Santa Maria, Hospital Universitário de Santa Maria. Santa Maria, RS, Brasil.

³ Universidade Federal de Santa Maria, Campus- Palmeiras das Missões, Centro de Ciências da Saúde. Palmeira das Missões, RS, Brasil.

⁴ Universidade Federal do Pampa. Uruguaiana, RS, Brasil.

There was no funding for the execution of this work.

The authors declare that there is no conflict in the conception of this work.

Correspondence
Fabiane Marzari Possatti
fabiane@politecnico.ufsm.br

Received: July 19, 2023
Approved: January 29, 2024

INTRODUCTION

Aging predisposes to a higher prevalence of non-communicable chronic and degenerative diseases, for which there is no curative treatment, and is associated with a lack of response to disease-modifying treatment, which can lead to situations of dependency and the need for long-term care¹. In light of this observation, the number of older adults residing in Long-Term Care Facilities (LTCFs) has increased in several countries, including Brazil².

LTCFs should serve as specialized homes with a dual function: to provide gerontogeriatric care according to the degree of dependency of their residents and to offer a homely, cozy environment capable of preserving the intimacy and identity of its residents². It is emphasized that the desires and wishes of institutionalized older adults need to be considered.

However, care in LTCFs has received a significant amount of criticism in recent years. Typically, the care in these institutions corresponds to automated technical actions that prioritize meeting physiological needs, neglecting the demands arising from individual uniqueness³.

It is observed that, in the daily context of living in LTCFs, nursing teams emerge as the frontline caregivers, spending a significant portion of their time in direct contact with the residents, shaping their well-being conditions. Therefore, in the perspective of considering the wishes and desires of the institutionalized older adult at the end-of-life, the role of these professionals and the aspects that intersect health and quality of life are highlighted⁴.

It should be emphasized that end-of-life stage is defined when the possibilities of recovering health conditions are exhausted, and the possibility of imminent and predictable death seems inevitable⁵.

Although the perception of older adults regarding aspects related to the end-of-life is recognized as an important indicator of quality, considerations and investigations related to this sphere are still scarce in institutional environments. From the perspective of institutionalized older adults having their desires and wishes met to experience a good death, the principles

of palliative care are urgent. These are holistic, active care approaches provided to individuals of all ages experiencing health-related suffering due to serious illnesses, and to those nearing the end-of-life; their aim is to improve the quality of life for both patients and their families and caregivers⁶.

The healthcare team in LTCFs needs to recognize the significance of this moment and strive to provide the best care conditions for this final stage of life, considering the individualities associated with this process and the complex needs linked to the physical and psychological state of the residents, as well as their preferences and desires.

Advanced care planning is considered particularly relevant for older adults residing in LTCFs due to the high likelihood of developing cognitive impairment and loss of decision-making capacity at the end-of-life⁷. In this logic, the life information and values of the older adult should be combined with technical care issues to build an individualized care plan that makes sense for that person; ensuring that as the clinical and/or cognitive condition progresses, they receive health treatments and care in line with their preferences⁸.

Understanding that preserving the capacity for decision-making, or autonomy, of older adults should be respected, it is considered relevant to individually discuss end-of-life issues with this population. In this light, there arises the need to recognize the older adult as an autonomous being and subject of their own will. Thus, the objective of this study is to understand the desires and wishes of older adult residents in LTCFs regarding end-of-life.

METHOD

This is qualitative research with a descriptive and exploratory nature. Qualitative research aims to understand and analyze phenomena explored from the perspective of participants, individually or in small groups, within a context related to the study^{9,10}.

The study was conducted in two philanthropic LTCFs in the Southern region of Brazil. It was chosen to propose the study in these two settings to have samples of older adults of both genders, female and male. In total, 18 older adults residing in LTCFs

participated, aged 60 years or older. The approach was made through prior contact with the nurses of the institutions, who suggested a list of names. Based on this list, the older adults were invited to participate in the research and were briefed on the need to previously undergo the Mini-Mental State Examination (MMSE).

In this context, participants who met the inclusion criteria were considered: older adults of both biological genders, aged 60 years or older, who achieved the cutoff scores stipulated by the MMSE; while those who did not reach the suggestive score for cognitive impairment were excluded. Data collection took place from March to May 2022. To obtain the information, a semi-structured interview technique was used, where closed-ended questions regarding sociodemographic data were initially applied, and the open-ended questions of the interview were conducted with the aid of the "cards on the table" resource.

This instrument, a deck of 24 cards, describes the desires and wishes of individuals at the end-of-life¹¹. The older adult was instructed to divide the deck into three piles; and in each pile, the resident placed the cards representing their desires and wishes at the end-of-life, considering those that were very important, somewhat important, and not important. Subsequently, participants were asked to select only ten desires from the pile labeled "very important," arranging the most important one at the top of the pile and the others in sequence. Shortly after, participants were invited to reflect and express how they would justify the "very important" and "not important" wishes and desires to their family, friends, and/or LTCFs professionals.

This study respected the ethical aspects of research involving human subjects in accordance with Resolution number 466/2012 and Resolution number 510/2016 of the National Health Council. It is emphasized that, before the research was conducted, the informed consent form was presented to the participants, following the approval of the project by the Research Ethics Committee of the Universidade Federal de Santa Maria – Pró-reitoria de Pós-graduação e Pesquisa (PRPGP), under protocol number 5,219,665. It is worth noting that the anonymity of the participants was preserved using codes with the initials "M" for male gender and "F" for female gender, "Rx" for the word resident, and an Arabic numeral indicating the participant's study number.

DATA AVAILABILITY

All the dataset supporting the findings of this study are available upon request to the corresponding author, Fabiane Marzari Possatti.

RESULTS

The data analysis employed was textual-discursive, consisting of four stages: deconstruction of the texts; establishment of relationships (categorization); capture of new emergent themes; and the realization of a self-organized process¹². After establishing 163 units of meaning, an intensive reading of the transcripts continued, resulting in the formation of 18 initial categories, which eventually converged into five final categories.

Chart 1. Construction of initial and final categories of desires and wishes of institutionalized older adults. Santa Maria, Rio Grande do Sul, 2022.

Initial Categories	Final Categories
Having Friends and Family Nearby	Reception and family acceptance: death in LTCF or at home and fear of dying alone
Dying at Home	
Not Dying Alone	
Family welcomes and accepts death (appeared twice)	
Possibility to Say Thank You, I'm Sorry, I Love You, and Goodbye	End of a life cycle: personal closure, farewell, affection, and faith
Assisting Others	
Preserving human dignity	Preservation of the human dignity of older adults in the end-of-life institutional setting
Relief from pain and shortness of breath (appeared twice)	
Listening to favorite music	
Relief from pain and shortness of breath	
Caring and trustworthy physicians and nurses	
Organized finances	Freedom from pressure and not being a burden to the family: wishes related to the actions of professionals and family members towards the older adult
Freedom from pressure	
Not being a burden to the family	
Being alert when passing away	maintenance of senses and awareness of death: desire for a beneficial, pain-free experience, of purification, and surrender through faith

Source: Authors (2022)

Chart 2. Sociodemographic data of the research participants. Santa Maria, Rio Grande do Sul, 2022.

Sociodemographic data	Men	Women
Absolute number	12	6
Age range interval of the researched population	62-81years	65-80 years
Marital status		
Single	6	2
Divorced	5	3
Widowed	1	1
Maternity	0	6
Paternity	6	0
Being grandparents	0	6
Not having children	5	0
Did not respond	1	0
Previous occupation		
Farmer	6	0
Homemaker	0	3
Others	6	3
Education level		
Four years or more of schooling	6	1
Less than four years of schooling	5	4
Illiterate	1	1
Monthly income		
01 minimum wage	11	4
More than 01 minimum wage	0	1
Does not receive a salary	1	1
Average length of institutionalization among participants	5 years and 3 months	5 years and 6 months

Source: Authors (2022)

1. Family Welcoming and Acceptance: Death in LTCFs or at Home and the Fear of Dying Alone.

Older adults residing in LTCFs expressed a desire to die at home; for some, the concept of home was associated with the LTCF itself, while for others, it was linked to their relatives' residence. The recognition of the institution as their domestic sphere endorses the social role these institutions fulfill; however, regardless of the location stratification, they signaled the desire to die close to their family and relatives.

"It's part of the family bond, all together in this moment (death). I wanted it to happen right here, at home." (M1R1)

"At the time of my death, it's important because they (family members) were my life (...). I wanted to be there at home, with them." (M4R4)

The discourse of these older adults highlights the cherished bond with family. Older adults residing in LTCFs do not wish to die feeling abandoned and anticipate the embrace of their family with acceptance of their death.

From the perspective of the desire of older adults to be able to die at home, other issues were also cited, such as the possibility of reducing costs associated with hospital care, delays in receiving attention, and concerns about overcrowding and bed optimization in hospitals.

"I prefer to die at home, which is here in the nursing home, rather than in the hospital, so I can pass away more peacefully." (M7R7)

"I don't need to be occupying someone else's bed, taking away the bed from people who could be hospitalized, sometimes even in a worse condition than mine and have no place." (M12R12)

In the perspective of not dying alone, spirituality and protection were considered relevant and pointed out as aids and hope for the final moments of their lives.

"I want to die asking the enlightened spirits, my saints and holy protectors, God and Jesus, to receive me." (M4R4)

Reaffirming the desire for the end-of-life to be built with support, resident seniors express their apprehension and fear of dying alone.

"(...) I am afraid of dying alone. I have no words." (M11R11).

"Because dying alone, having no one by your side, is sad." (M5R5)

2. End-of-a-life cycle: a moment of personal reflection, farewell, affection, and faith

Older adults expressed their desire to convey their gratitude and affection to their family members; a demonstration of respect and affection that should be expressed both throughout life and in the final stage.

It is identified that, for the participants, it was important to reframe emotional bonds, resolve past conflicts or disagreements, value the final moments of their existence, and take the opportunity to bid farewell. Thus, remaining socially connected or rebuilding bonds with their loved ones is shown to be the desire and will of older adults residing in LTCFs.

"It's important, because you're going to bid farewell, won't see anything anymore, it's over, to at least have a memory." (M12R12).

"Because I believe that in the past when I was younger, I said a lot (...), but it hurt. And I couldn't contain that impulse to speak harshly to people I didn't like, and 'it's wrong.'" (F2R14).

Associated with the desires and wishes of older adults for direct benefit, the possibility of assisting other residents stands out. The willingness to help others is displayed as a form of reciprocation for the assistance received from others during the course of their lives.

"I feel like a different person, better (referring to helping others)." (M11R11)

"Today they are doing it, tomorrow they might be receiving a bath." (M12R12).

3. Preservation of the human dignity of older adults who are institutionalized in the terminal phase of life.

Regarding their expectations of how they want to receive care in the terminal phase of their lives, older adults refer to attentive and respectful care in old age, with humanization manifested through touch, and they expect the professionals involved in their care to be present and preserve human dignity.

"If they serve me with ill will, then they shouldn't serve me at all. I said: (...) Have a little respect and dignity for her, go to her room to see if she's still alive. They wouldn't even touch her anymore (...) Don't you think that's a lack of dignity?" (F4R16).

"Because respect is everything." (F1R13)

In the perspective of preserving the dignity of older adults in the terminal phase of their lives, they desire to listen to their favorite music. This gesture has been considered a promoter of joy, a sense of freedom, pain reduction, and also promotes mental relaxation.

"My wish has always been to have music (...) even for certain people, music is a medicine when the end is near. Turn on some music and just listen to it." (M12R12).

"Music is one of the few things that moves me and calms me down (...). It takes me on a journey, it does me good, I don't know why." (F6R18).

Another desire mentioned aligned with the perspective of wanting to be attended to and cared for by careful and trustworthy healthcare professionals.

"I have physicians who are very sincere. I think sincerity should be used with the person who is ill. It's a way of respecting the person, they will decide what they want, and what they need or don't need." (F2R14).

"Because it has to be someone you trust to talk to about your problems (...) there has to be empathy, unity, communion." (F6R18).

Another concern of older adults relates to financial matters. This organization gives them more security and enables them to achieve autonomy to make decisions and tranquility in the terminal phase of their existence.

"Leaving it to the children so that they don't struggle later." (M3R3).

"With money, I'm at ease, let's put it that way, I don't depend on many anymore. I can already solve the problem on my own, I have enough." (M12R12).

4. Not being pressured and not being a burden to the family

Older adults mentioned feeling pressured by situations of fragility in communication from professionals, family members, and other affectionate bonds; not aiding in the therapeutic process in the terminal phase of life.

"I don't like it when someone says something or tells me (...) it could be the same words, but the way they say them. Because the decision is mine." (F2R14).

Regarding the desire of older adults not to feel like a burden to their families during this period, there is an expressed wish to be able to take care of themselves.

"There won't be a shortage of people to care for me, to look after me. May I have a peaceful illness, where I can help myself. Maybe I'll end up in the hospital, then I don't know." (F5R17).

5. Maintenance of senses and awareness of death: desire for a beneficial experience with pain control, purification, and surrendering of life through faith

From the perspective of the desires of older adults, they considered themselves conscious enough to ask for forgiveness from God for the mistakes made in life. Additionally, there is mention of the desire to experience death as a passage with positive feelings.

"If I am conscious and aware of death, let the cleansing come, because to die you need to be conscious and know that you are going to die." (F2R14)

"I didn't want to die in my sleep, I wanted to feel death, have a good vision (...) and hand life and death over to God." (F5R17)

In this sense, the residents wished to be conscious but with adequate analgesia to be able to die without pain, and they preferred to have a sudden death.

"I want to be conscious in the sense that I have already taken that morphine, for pain. And to be pain-free, you know?" (F4R16).

"I want to be awake when I die. I want to die suddenly." (F4R16).

One resident also mentioned wanting to preserve their senses to stay alert to the care received near the end-of-life; as they were afraid of not receiving the attention they needed.

"I want... in the senses, like a policing of the person. Because, when you are on the brink of death, when you are very ill, they treat you a lot like trash, I think." (F6R18)

DISCUSSION

Among the sociodemographic aspects of the older adults in this study, it is noteworthy that the female population is larger than the male population. Studies conducted in Brazil have reported that older adults residing in Long-Term Care Facilities (LTCFs) were mostly women and had a higher average age than men. Furthermore, the age group with the highest number of older adults in Brazilian LTCFs is between 71 and 80 years old¹⁵.

Regarding the income of older adults in LTCFs^{13,15-17}, it has been identified that almost all older adults were retired and received, on average, one minimum wage. Additionally, concerning the duration of institutionalization, a study reported similar data to those of this research by indicating that the length of stay for older adults in LTCFs

ranged from one to five years¹⁵. Regarding the motivations that led older adults to reside in LTCFs, the reasons reported were due to family members being unable to provide them with the necessary care, as well as issues related to severed bonds^{16,17}.

In a study informed by a scoping review, it was reported that family is considered essential in the final moments, and therefore, the majority of residents wish to die close to their family members¹⁸. Furthermore, the family is considered to play an important role in distracting worrisome thoughts; it is beneficial to be there, despite the patient's physical and/or mood changes, and to strive to remain until the end¹⁹.

The desire to be at home at the end of their lives is expressed by institutionalized older adults. Recognizing the LTCFs as a domestic sphere is established by preserving identity, privacy, and ensuring a welcoming environment of respect and dignity for older adults². Reasons include previous instances of unsuccessful care, the comfort of home, and concerns about the costs of prolonged periods²⁰.

Among the main desires and wishes of the participants is the desire to avoid loneliness. The fear of dying alone is linked to the fact that loneliness is a subjective experience. Thus, loneliness is often identified as a feeling that can be present even in the company of others²¹.

In this context, it can be inferred that for older adults in LTCFs, the significance of dying feeling alone is the abandonment by loved ones, in addition to feeling fearful of this condition²². Some individuals may view death with serenity; others, with overwhelming fear²³. Faced with the question of the fear of dying alone, the older adult should be understood in their singularity and entirety; as the experiences at the end-of-life will depend on the context in which they are placed, their history, and their exposure to situations that make them vulnerable²⁴.

In this sense, personal redemption at the end-of-life does not diminish the need to love and be loved, to forgive or be forgiven, and to maintain intimate and trusting relationships. Perhaps, at this stage, these needs are even more urgent to recognize as

the "last opportunity"¹⁵. The desire to bid farewell to one's bonds of affection and to seek forgiveness and reconciliation allows their shortcomings not to be considered of great importance in retrospect, and for these bonds to remain within them as fond memories after their death⁴.

From the perspective of older adults developing resilience at the end-of-life, the presence of relationships of assistance to others aids in better coping with adverse situations such as debilitating illness or death²⁵. The principle of human dignity establishes protection and autonomy for the individual by imposing minimal conditions for humans to truly live, die, and not just survive²⁶.

Physical proximity, human warmth, support, and respectful, open, and honest communication are of great importance to people who are nearing the end-of-life⁴. Preserving the dignity of residents is the responsibility of healthcare professionals and is a central value in the perspective of palliative care²⁷. They also attribute the possibility of maintaining dignity in being able to manage their finances, maintain friendships, not feel pain, listen to their favorite music, and have interactions among them conducted in a respectful manner.

In the mentioned aspect, older adults living in LTCFs desire to be cared for by professionals within a relationship based on trust, respect, and communication, so that they perceive that the caregivers are concerned about their well-being²⁸. Therefore, it is seen that the resident's concern about death is related to the outcome it may have on others²⁹.

Empathy should be established among the older adult, the family, and the professionals; and exchanges of ideas and information about the needs of the older adult should occur through harmonious dialogue³⁰. Along the same lines, professional conduct should provide singular attention in order to enable greater comfort for the discomforts felt by the ailing individual, understanding that they are unique, personal, and non-transferable³¹.

In this sense, professional conduct should provide singular attention and empathy to enable greater comfort for the discomforts felt by the ailing

individual²². The older adult should have decision-making autonomy until death; as this makes them feel more secure and less pressured³⁰.

From the perspective of maintaining awareness of death and consciousness, spirituality can improve the psychosocial stability of the individual, strengthen their self-identity, and promote adjustment to death²¹. Experiencing spirituality as a central component in life proves to be an important resource in maintaining psychological well-being, especially for vulnerable institutionalized older adults⁵. Furthermore, faith and support driven by spirituality provide inner balance in the face of terminal situations²². Older adults wish to die conscious as a foundation to fulfill and enforce their other desires or due to religious reasons⁴. From the standpoint of remaining vigilant to observe the care that will be provided, older adults in palliative care wanted to stay alert, as they believed that a Long-Term Care Facility would provide inferior care³².

In this context, the desire for freedom from pain was central for the residents. Personal experiences or previous illnesses were cited as concerns regarding symptoms already experienced³.

It is worth noting that the research has limitations as it only encompassed two LTCFs and disregarded residents who did not achieve a minimum score on the Mini-Mental State Examination (MMSE), whose desires and wishes were not known.

CONCLUSION

The results of the study provided insight into the desires and wishes of older adults residing in LTCFs at the end-of-life. It was evident that such desires and wishes are characterized by concerns related to how they are cared for by healthcare professionals; however, primarily, by aspiring to broad aspects of life.

In the study, it was observed that the majority of participants were willing, wanted, and felt the need to speak about their desires and wishes. From this perspective, the reception, acceptance by family, and the possibility of death occurring in the LTCF or at home constitute desired situations. Furthermore, the moment of death represents the end of a life cycle

in which there is a need for personal reconciliation, farewell, affection, and reinforcement of faith.

This research also enables collaboration so that the actions of healthcare professionals, especially nurses, can be enriched with knowledge of desires and wishes regarding the end-of-life. It leads to developments in which these desires and wishes can be documented to positively influence older adults to preserve their autonomy and dignity at the end-of-life.

AUTHORSHIP

- Fabiane Marzari Possatti - conception and design or analysis and interpretation of data, drafting the paper or critical revision, approval of the version to be published, and responsibility for all aspects of the work, ensuring that issues related to the accuracy or integrity of any part of the work are addressed.
- Silvana Bastos Cogo - Drafting the paper or critical revision, approval of the version to be published, and responsibility for all aspects of the work, ensuring that issues related to the accuracy or integrity of any part of the work are addressed.

- Marinês Tambara Leite - Drafting the paper or critical revision, approval of the version to be published, and responsibility for all aspects of the work, ensuring that issues related to the accuracy or integrity of any part of the work are addressed.
- Cenir Gonçalves Tier - Drafting the paper or critical revision, approval of the version to be published, and responsibility for all aspects of the work, ensuring that issues related to the accuracy or integrity of any part of the work are addressed.
- Nara Marilene Oliveira Girardon Perline - Drafting the paper or critical revision, approval of the version to be published, and responsibility for all aspects of the work, ensuring that issues related to the accuracy or integrity of any part of the work are addressed.
- Larissa Venturini - Drafting the paper or critical revision, approval of the version to be published, and responsibility for all aspects of the work, ensuring that issues related to the accuracy or integrity of any part of the work are addressed.

Edited by: Marquiony Marques dos Santos

REFERENCES





1. Chaimowicz F. Rede de atenção: saúde do idoso. Belo Horizonte: NESCON/UFMG; 2018 [access: November 23, 2023]. Available at: https://www.nescon.medicina.ufmg.br/biblioteca/imagem/Rede-atencao_saude_do_idoso_Vers%C3%A3o_Final.pdf.
2. Lima APM, Gomes KVL, Frota NM. Qualidade de vida sob a óptica da pessoa idosa institucionalizadas. Rev. Bras em Promoção da Saúde 2016 [access: November 27, 2023] ;(1):14-19. Available at: <https://www.redalyc.org/pdf/408/40846964003.pdf>.
3. Klemmt M, Henking T, Heizmann E, Best L, Oorschot BV, Neuderth S. Wishes and needs of nursing home residents and their relatives regarding end-of-life decision-making and care planning-A qualitative study. J Clin Nurs 2020 [access: November 22, 2023];29(13-14):2663-2674. Available at: <https://pubmed.ncbi.nlm.nih.gov/32301187/>.
4. Silva SMA. Os cuidados ao fim da vida no contexto dos cuidados paliativos. Revista Brasileira de Cancerologia 2016 [access: December 2, 2023];62(3):253-257. Available at: https://rbc.inca.gov.br/site/arquivos/n_62/v03/pdf/08-artigo-opinioao-os-cuidados-ao-fim-da-vida-no-contexto-dos-cuidados-paliativos.pdf.
5. Kurkowski S, Heckel M, Schüssel, KV. Wishes of nursing home residents for their dying. Z Gerontol Geriatr., 2018 [access: December 5, 2023]. Available at: <https://doi.org/10.1007/s00391-018-1444-2>.
6. International Association for Hospice Palliative Care. Global Consensus-based palliative care definition. 2018 [access: November 28, 2023]. Available at: <https://hospicecare.com/what-we-do/projects/consensus-based-definition-of-palliative-care/definition/>.

7. Pivodic L, Smets T, Noortgate NV, Philipsen BDO, Engels Y, Szczerbińska K et al. Quality of dying and quality of end-of-life care of nursing home residents in six countries: An epidemiological study. *Palliat Med.* 2018 [access: November 17, 2023];32(100): 1584-1595. Available at: <https://pubmed.ncbi.nlm.nih.gov/30273519/>.
8. Agarwal R, Epstein AS. Advance care planning and end-of-life decision making for patients with cancer. *Seminars in oncology nursing* 2018 [access: November 18, 2023];34(3): 316-326. Available at: <https://doi.org/10.1016/j.soncn.2018.06.012>.
9. Groebe B, Rietz C, Voltz R, Strupp J. Talking about attitudes towards the end of life: what does it need? *Innovation in Aging.* 2018 [access: December 7, 2023];2(1):990. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6239737/>.
10. Sampieri RH, Collado CF, Lucio MPB. Metodologia de pesquisa. 5a. ed. Porto Alegre: Penso; 2013. ISBN: 978-85-65848-28-2.
11. Sociedade Brasileira de Geriatria e Gerontologia. Cartas na mesa é discutido em entrevista ao site Testamento Vital. Brasília, 2017 [access: November 23, 2023]. Available at: <https://sbgg.org.br/cartas-na-mesa-e-discutido-em-entrevista-ao-site-testamento-vital/>.
12. Moraes R, Galiuzzi MC. Análise textual discursiva. 3a. ed. Ijuí: Unijuí; 2016. ISBN: 978-65-86074-19-2.
13. Rosa VPP, Urbanetto JS. Perfil sociodemográfico e clínico e sua associação com o grau de dependência em idosos institucionalizado. *Estud. Interdiscipl. envelhec.* 2021 [access: November 26, 2023];27(3):315-333. Available at: <https://www.seer.ufrgs.br/index.php/RevEnvelhecer/article/view/104973/86146>.
14. Alcântara RKL, Cavalcante MLSN, Fernandes BKC, Lopes VM, Leite SFP, Borges CL. Perfil sociodemográfico e condições de saúde de idosos institucionalizados. *Rev. Bras. Pesq. Saúde* 2017 [access: November 23, 2023];19(3):674-679. Available at: <https://periodicos.ufpe.br/revistas/revistaenfermagem/article/view/237384/31556>.
15. Parisi DP, Lima MC, Heringer MP. Perfil sociodemográfico, clínico, de avaliação cognitiva e funcional de idosos institucionalizados em ILPIs. *Rev. Longeviver* 2019 [access: December 10, 2023];1(4):17-28. Available at: <https://revistalongeviver.com.br/index.php/revistaportal/article/viewFile/802/861>.
16. Silva PN, Gehm LP, Lopes IR, Rocha IC, Katagiri S. Perfil de medicamentos utilizados por idosos institucionalizados da região Médio-Araguaia/Aragarças-GO. *Braz. J. Hea. Rev.* 2019 [access: November 11, 2023];2(4):2438-2452. Available at: <https://www.brazilianjournals.com/ojs/index.php/BJHR/article/view/1796/1750>.
17. Fluetti MT, Fhon JRS, Oliveira AP, Chiquito LMO, Marques S. Síndrome da fragilidade em idosos institucionalizados. *Rev. Bras. Geriatr. Gerontol.* 2018 [access: November 23, 2023];2(1):61-69. Available at: <https://www.scielo.br/j/rbagg/a/dQ8FsRKJBkLVD8N4HYcSCKN/?format=pdf&lang=pt>.
18. Schweighart R, Sullivan JL, Klemmt M, Teti A, Neuderth S. Desejos e necessidades de residentes de asilos: uma revisão de escopo. *Saúde* 2022 [access: December 23, 2023];10(5):854. Available at: <https://www.mdpi.com/2227-9032/10/5/854>.
19. Gulp JLPV. Viver e morrer com câncer incurável: um estudo qualitativo sobre os valores de vida de pacientes idosos e a responsabilidade dos profissionais de saúde. *Cuidados Paliativos BMC* 2020 [access: December 10, 2023]. Available at: <https://doi.org/1186/s12904-020-00618-w>.
20. O'Neill M, Ryan A, Tracey A, Laird L. 'Waiting and wanting': older peoples' initial experiences of adapting to life in a care home: a grounded theory study. *Ageing Soc.* 2020 [access: November 17, 2023];42 (2):351-375. Available at: <https://doi.org/10.1017/S0144686X20000872>.
21. Arrieira ICO, Thoferhn MB, Schaefer OM, Fonseca AD, Kantorski LP, Cardoso DH. O sentido do cuidado espiritual na integralidade da atenção em cuidados paliativos. *Rev Gaúch Enferm.* 2017 [access: November 22, 2023];38(3). Available at: <https://doi.org/10.1590/1983-1447.2017.03.58737>.
22. Martins, EC. A percepção da morte por idosos institucionalizados: estudo fenomenológico em dois lares residenciais portugueses. *Serviço Social em Revista* 2019 [access: November 12, 2023];21(2):498-522. Available at: <http://hdl.handle.net/10400.11/6488>.
23. Pichler N, Zancanaro M, Scortegagna H, Oliveira T. Percepções de um grupo de idosos sobre a morte. *Revista Psicologia, Saúde & Doenças* 2021 [access: November 15, 2023]; 22(3):921-927. Available at: www.sp-ps.pt <https://doi.org/10.15309/21psd220312>.
24. Schenker M, Costa DH. Avanços e desafios da atenção à saúde da população idosa com doenças crônicas na Atenção Primária à Saúde. *Ciência & Saúde Coletiva* 2019 [access: October 4, 2023];24(4). Available at: <http://doi.org/10.1590/1413-81232018244.01222019>.
25. Parker, C. Religião popular e modernização capitalista: uma lógica na América Latina. Petrópolis, RJ: Vozes; 1996. ISBN: 978-8532616647.

26. Vecchi, ID, Garcia, ML, Pilau Sobrinho LL. O princípio da dignidade humana e suas projeções no âmbito laboral: possibilidades e limites. *Sequência estudos Jurídicos e Políticos* 2020[access: November 16, 2023];41(85):249–286. Available at: <https://doi.org/10.5007/2177-7055.2020v41n85p249>.
27. Viftrup DT, Hvidt NC, Prinds C. Dignity in end-of-life care at hospice: an action research study. *Scandinavian Journal of Caring Sciences* 2021[access: November 23, 2023];35(2):420-429. Available at: <https://doi.org/10.1111/scs.12872>.
28. Abbott KM, Heid AR, Kleban DM, Rovine MJ, Haitsma KV. The Change in Nursing Home Residents' Preferences Over Time. *J Am Med Dir Assoc.* 2018[access: December 23, 2023]; 19(12):1092-1098. Available at: <https://doi.org/10.1016/j.jamda.2018.08.004>.
29. Fleming J, Farquhar M, Brayne C, Barclay S. Death and the oldest old: attitudes and preferences for end-of-life care - qualitative research within a population-based cohort study. *Plos One* 2016[access: November 11, 2023];11(4). Available at: <https://doi.org/10.1371/journal.pone.0150686>.
30. Alecrim TDP, Miranda JAM, Ribeiro BMSS. Percepção do paciente oncológico em cuidados paliativos sobre a família e a equipe de enfermagem. *Cuid.Enferm.* 2020[access: November 17, 2023];14(2):206-212. Available at: <http://www.webfipa.net/facfipa/ner/sumarios/cuidarte/2020v2/p.206-212.pdf>.
31. Silva RRA, Gonçalves SJC. A influência da compreensão da perspicácia do enfermeiro e seu manejo clínico na unidade de cuidado paliativo. *Revista Pro- Universus* 2019[access: November 11, 2023];10(1):60-65. Available at: <http://editora.universidadevassouras.edu.br/index.php/RPU/article/view/1657>.
32. Mansfield JC, Brill S. After providing end of life care to relatives, what care options do family caregivers prefer for themselves? *PloS one* 2020[access: Novembro 12, 2023];15(9). Available at: <https://doi.org/10.1371/journal.pone.0239423>.



Comparative analysis of older adults and hospitalized adults' perception of hospital diet quality

Letícia Aeko Barone Ozawa¹ 
Eduardo Federighi Baisi Chagas^{1,2} 
Joyce Fernanda Soares Albino Ghezzi^{1,3} 
Maria Angélica Spadella¹ 

Abstract

Objective: To analyze and compare the perception of hospital diet quality between older adults and hospitalized adults. **Method:** Quali-quantitative research conducted at a public hospital in the state of São Paulo, Brazil, involving older adults (n=185) and adults (n=185) who have been hospitalized for at least three days, receiving a general/soft oral diet, and classified according to the prescribed diet type: unrestricted diet (GSR), for glycemic control (GDM), or low-sodium (GHSS). The data were collected through individual interviews, utilizing a validated questionnaire. Diet quality was assessed using a Likert scale, considering the categories of taste, temperature, quantity, appearance, meal timing, hygiene, and availability for food substitution. The qualitative data were subjected to thematic content analysis, while the quantitative data underwent descriptive and statistical analysis using Kruskal-Wallis tests (for quantitative variables) and chi-square tests (for qualitative variables). **Results:** Regardless of the prescribed diet ($p \geq 0.05$), both older adults and hospitalized adults considered the quality of hospital food satisfactory (Good/Excellent) across the assessed satisfaction categories, except for taste, which showed a significant association with the prescribed diet for older adults ($p = 0.05$). Three thematic categories emerged from the reports, indicating that both older adults and adults understand the importance of hospital diet for health recovery, yet a negative expectation regarding the offered meal is still prevalent. Hospital diets with restrictions influence taste perception in older adults. Understanding this particularity can assist in the creation of strategies for adaptation and better acceptance of hospital diets for this age group.

Keywords: Aging. Diet, Food, and Nutrition. Taste Buds. Food Service. Hospital.

¹ Faculdade de Medicina de Marília (Famema), Programa de Pós-graduação em Saúde e Envelhecimento (PPGSE). Marília, SP, Brasil.

² Universidade de Marília (UNIMAR), Programa de Pós-Graduação em Interações Estruturais e Funcionais em Reabilitação. Marília, SP, Brasil.

³ Faculdade de Ensino Superior e Formação Integral (FAEF). Garça, SP, Brasil.

Funding: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES). Código de financiamento: 001.

The authors declare that there is no conflict in the conception of this work.

Correspondence
Joyce Fernanda Soares Albino Ghezzi
jo.albino1988@gmail.com

Received: August 10, 2023
Approved: January 29, 2024

INTRODUCTION

In the early twentieth century, nuns took charge of hospital kitchens, preparing diets for the poor and the sick according to medical prescriptions¹. In the 1970s, the implementation of Hospital Food and Nutrition Units began with the aim of restoring and/or maintaining the nutritional status and health condition of patients².

The correlation of the dietary phenomenon with the recovery process is considered fundamental for the clinical and/or surgical treatment of hospitalized individuals. Therefore, the patient's non-acceptance of hospital diet can hinder their recovery, leading to complications arising from hospital malnutrition and increasing the probability of death^{3,4}.

Despite the importance of hospital diet as an adjunct in therapy, this type of food is still mystified by the population as tasteless, cold, bland, served early, and restrictive, leading to insufficient food intake by the patient, compromising their recovery⁵. Hospital diet, therefore, affects the individual's psychosensory and symbolic attributes, which can negatively influence their experience during hospitalization and their health^{6,7}.

Thus, concerns arise, particularly regarding older adults, whose numbers have been growing in recent years, bringing with them increased demand for healthcare services, including hospitalizations⁸. These individuals account for 23% of the total hospital admissions in the country, with an average length of stay of seven days, 25% longer than the hospitalization period of other age groups⁹. Furthermore, there is a decline in sensory perception with aging, especially in olfaction and taste, which can affect appropriate dietary intake^{10,11} and, consequently, be reflected in the number and duration of hospitalizations among older adults, as well as in hospital malnutrition.

In older adults, other factors can also influence nutrition, such as chewing, digestion, continuous use of medications, mobility difficulties, socioeconomic issues, and Non-Communicable Chronic Diseases (NCDs)^{8,11-13}. Systemic Arterial Hypertension

(SAH) and Diabetes Mellitus (DM), which are more prevalent in older adults, are associated with greater dietary restrictions, increased rates of hospitalizations, worsening nutritional status, and also influence food perception^{8,12,14}.

However, most of the time, the sensory perception of older adults is disregarded, although it has a significant impact on taste and pleasure in eating. A study comparing the gustatory sensitivity of non-hospitalized adults and older adults found alterations in the perception of sweet and salty tastes, predisposing them to add more sugar and/or salt to their food, which negatively impacts the control of SAH and DM¹⁵. In relation to sour and sweet solutions, another study showed that older adults exhibited reduced taste perception compared to adults¹⁶.

In the hospital context, sensory perception alterations can worsen, as environmental, physiological, and dietary factors may hinder oral feeding in older adults¹⁷. It is common for most older adults to consume less food during hospitalization than when they are at home. This scenario becomes even more serious when considering that older patients tend to stay hospitalized for longer periods and more frequently.

Although there is a strong correlation between the quality of hospital diet and its acceptance by hospitalized individuals, it is not known whether this acceptance may vary depending on age group, or if it can be negatively exacerbated by the restrictions and characteristics of the diet offered in the hospital. These are two conditions directly related to older adults, considering their greater sensory and functional decline and the need for restrictive diets due to the prevalence of NCDs in this population.

Therefore, considering that hospital diets for older adults, with or without dietary restrictions, are not individualized according to their needs and particularities, this study aimed to analyze and compare the perception of hospital diet quality among older adults and hospitalized adults for different prescribed diet types, as well as to understand the significance of this food for both populations.

METHOD

Quali-quantitative research with a cross-sectional design was conducted at a public healthcare and teaching hospital located in the interior of São Paulo state, Brazil, which is part of the health care network of the Regional Department of Health (DRS - Departamento Regional de Saúde) IX. It serves as a reference for specialized care at different levels of complexity, operating 199 hospital beds exclusively linked to the Unified Health System (SUS - Sistema Único de Saúde). It has a Food and Nutrition Unit (UAN - Unidade de Alimentação e Nutrição), certified by ISO 9001:2015, which provides meals orally and through feeding tubes. It provides an average of 600 main meals (lunch and dinner), 800 small meals (breakfast and snacks) to patients, caregivers, and staff per day, as well as 300 enteral diets. Data collection took place in four medical and surgical wards from June 2018 to June 2019, due to the presence of patients meeting the inclusion criteria in these wards.

Participants were older adults (≥ 60 years) and adults (18 to 59 years) of both sexes, hospitalized for at least three days, a sufficient amount of time to express opinions about the provided food¹⁸, and receiving a general or soft oral diet, distributed into three prescription types: unrestricted diet (GSR), for glycemic control (GDM), and low-sodium (GHSS). Patients who were unable to communicate, those with oral cavity wounds, those receiving enteral or parenteral nutrition, and those fasting were excluded from the study.

For the quantitative approach, the sample size calculation considered a medium effect size of 0.3, a type I error margin (α) of 5%, and a study power of 80%, indicating the need for a minimum sample of 185 individuals per age group. For proportional distribution of patients in diets and age groups, the comparison groups were as follows: 185 older adults, with 126 on GSR diet, 43 on GHSS, and 16 on GDM; 185 adults, with 153 on GSR diet, 22 on GHSS, and 10 on GDM, totaling 370 participants.

For the qualitative approach, the number of interviewees took into consideration the criteria of data exhaustiveness and saturation¹⁸. Thus, a total of

70 participants were included, comprising 37 adults and 33 older adults.

The data collection procedure involved daily analysis of the hospital census to identify potential candidates, followed by personal contact with the patient to explain the research. After obtaining agreement and signing the Informed Consent Form, the interview began (on average 20 minutes) with one of the researchers, who was a nutritionist from the research setting, trained in non-directive techniques.

The data collection consisted of four stages. Stage I: characterization of participants regarding socioeconomic profile, using the Critério Brasil questionnaire¹⁹. Stage II: collection of participant hospitalization data from the hospitalization form, considering the reason and duration of hospitalization, prescribed diet, and associated chronic disease. Stage III: administration of a questionnaire to assess participants' perception of hospital diet quality, considering: taste, temperature, quantity, appearance, meal timing, hygiene, and availability for food substitution. Participants were asked to express their opinion using a Likert scale of satisfaction: excellent, good, fair, or poor. Participants were also asked about their appetite (preserved, reasonable, or poor) and their salivation (reduced, increased, or normal). The same satisfaction questionnaire used by the hospital's UAN nutritionists in this study was employed, following quality standards adopted in hospital services²⁰. Stage IV: Two open-ended questions were asked regarding the participant's perceptions of hospital food: what were their expectations regarding this food, and what knowledge they had about their dietary restrictions, when applicable. This questionnaire was validated in a pilot study with individuals of the same characteristics as the target population, totaling 18 participants (nine per age group and prescribed diet). It underwent adjustments for readability and understanding of the questions. To ensure reliability and preserve the originality of the testimonies, the interviews were conducted with a digital voice recorder, and after transcription, the recordings were deleted. They were conducted at the bedside, with the presence of both the interviewer and the interviewee, preserving anonymity and avoiding potential biases. There were no dropouts or need for repeat interviews.

In the analysis of quantitative data, comparisons between groups for quantitative variables were performed using the Kruskal-Wallis test, followed by pairwise comparisons using the Mann-Whitney test with Holm-Sidak post-hoc correction. The association between qualitative variables was analyzed using the chi-square test. Quantitative variables are described by median and interquartile range (25th and 75th). Qualitative variables are described by relative (%) and absolute (n) frequency distribution. The significance level adopted was 5%.

Regarding the qualitative approach, the speeches were transcribed and subjected to the theoretical-analytical framework of thematic content analysis proposed by Minayo. The analysis involved breaking down the text into units and then categorizing them into groups. For anonymity and confidentiality of the collected testimonies, participants were identified as Older Adult or Adult, followed by the acronym of the prescribed diet.

The research followed the norms and regulatory guidelines for research involving human subjects, being reviewed and approved by the Institutional Review Board (IRB) of the involved institution, obtaining a favorable number 2,596,014, CAAE: 85263318.0.0000.5413.

DATA AVAILABILITY

The dataset is not publicly available due to containing information that compromises the privacy of the research participants.

RESULTS

The participant population consisted of 370 individuals, comprising older adults (n=185) and adults (n=185), ranging in age from 18 to 94 years with a mean age of 54.6 years. Of these, 58.6% were male, 51.9% were married or in a stable union, 43.8% had completed up to nine years of schooling, 70.0% were of white ethnicity, 58.1% were Catholics, 83.2% lived with family, and 56.5% belonged to socioeconomic class C. There was no significant association between participants' characteristics and diet and age, except for whether they had hypertension and/or diabetes mellitus (Table 1).

When comparing age among the types of diets, it was observed that participants with the GHSS diet were older than those with the GSR diet, however, there was no significant difference between those with GSR and GDM diets. It is also noted that the age group of 60 years or older was concentrated in the GHSS or GDM diets, with more older adults on a low-sodium diet (Table 2).

The prevalent diagnosis at admission, according to the International Statistical Classification of Diseases and Related Health Problems (ICD-10), was circulatory diseases in 22.7% of adults and 26.5% of older adults, with the most common being: hypertension, acute myocardial infarction, pulmonary embolism, heart failure, stroke, atherosclerosis, arterial and venous thrombosis. Both age groups showed a similar distribution of morbidities, which reduces the study's bias regarding morbidity.

Table 1. Analysis of absolute frequency (f) and relative frequency (%) distribution of participant population characteristics regarding the prescribed diet type and age group. Marília, SP, 2019.

Characteristics	Adult			<i>p</i> -value	Older adult			<i>p</i> -value
	GSR (n = 153)	GDM (n = 10)	GHSS (n = 22)		GSR (n = 126)	GDM (n = 16)	GHSS (n = 43)	
	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)		<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)	
Gender								
Male	92 (60.1)	7 (70.0)	9 (40.9)	0.14	79 (62.7)	9 (56.3)	21 (48.8)	0.10
Female	61 (39.9)	3 (30.0)	13 (59.1)		47 (37.3)	7 (43.8)	22 (51.2)	
Marital status								
Single	79 (51.6)	3 (30.0)	9 (40.9)	0.22	58 (46.0)	9 (56.3)	20 (46.5)	0.85
Married/stable union	74 (48.4)	7 (70.0)	13 (59.1)		68 (54.0)	7 (43.8)	23 (53.5)	
Education								
0 - 3 years	21 (13.7)	1 (10.0)	3 (13.6)	0.92	50 (39.7)	6 (37.5)	15 (34.9)	0.76
Up to 9 years	64 (41.8)	4 (40.0)	10 (45.5)		53 (42.1)	7 (43.8)	24 (55.8)	
More than 9 years	68 (44.4)	5 (50.0)	9 (40.9)		23 (18.3)	3 (18.8)	4 (9.3)	
Ethnicity								
White	100 (65.4)	7 (70.0)	11 (50.0)	0.38	98 (77.8)	13 (81.3)	30 (69.8)	0.19
Black	11 (7.2)	0 (0.0)	4 (18.2)		4 (3.2)	0 (0.0)	3 (7.0)	
Brown	41 (26.8)	2 (20.0)	7 (31.8)		23 (18.3)	2 (12.5)	7 (16.3)	
Yellow	0 (0.0)	1 (10.0)	0 (0.0)		1 (0.8)	0 (0.0)	2 (4.7)	
Red	1 (0.7)	0 (0.0)	0 (0.0)		0 (0.0)	1 (6.3)	1 (2.3)	
Religion								
Catholic	81 (52.9)	3 (30.0)	12 (54.5)	0.51	83 (65.9)	9 (56.3)	27 (62.8)	0.86
Evangelical	56 (36.6)	4 (40.0)	10 (45.5)		32 (25.4)	4 (25.0)	10 (23.3)	
Spiritist	2 (1.3)	1 (10.0)	0 (0.0)		2 (1.6)	2 (12.5)	3 (7.0)	
Other	1 (0.7)	0 (0.0)	0 (0.0)		1 (0.8)	1 (6.3)	3 (7.0)	
Not declared	13 (8.5)	2 (20.0)	0 (0.0)		8 (6.3)	0 (0.0)	0 (0.0)	
Housing situation								
Alone	13 (8.5)	1 (10.0)	2 (9.1)	0.89	34 (27.0)	4 (25.0)	8 (18.6)	0.28
Family	140 (91.5)	9 (90.0)	20 (90.9)		92 (73.0)	12 (75.0)	35 (81.4)	
Socioeconomic class								
A-B	34 (22.2)	3 (30.0)	3 (13.6)	0.37	21 (16.7)	4 (25.0)	6 (14.0)	0.46
C	93 (60.8)	5 (50.0)	14 (63.6)		69 (54.8)	6 (37.5)	22 (51.2)	
D-E	26 (17.0)	2 (20.0)	5 (22.7)		36 (28.6)	6 (37.5)	15 (34.9)	
SAH								
No	124 (81.0)	6 (60.0)	4 (18.2)	<0.001*	63 (50.0)	4 (25.0)	7 (16.3)	<0.001*
Yes	29 (19.0)	4 (40.0)	18 (81.8)		63 (50.0)	12 (75.0)	36 (83.7)	
DM								
No	146 (95.4)	0 (0.0)	20 (90.9)	0.002*	100 (79.4)	0 (0.0)	35 (81.4)	0.38
Yes	7 (4.6)	10 (100.0)	2 (9.1)		26 (20.6)	16 (100.0)	8 (18.6)	

n = number of participants; GSR = general diet without restriction; GDM = general diet for glycemic control; GHSS = general low-sodium diet. **p*-value ≤ 0.05 indicates significant association with the type of diet prescribed by the chi-square test.

Table 2. Comparison of age groups among participant groups (N = 370) by prescribed diet. Marília, SP, 2019.

	Prescribed diet									<i>p-value</i>
	GSR (n = 279)			GDM (n = 26)			GHSS (n = 65)			
	25 th	Med.	75 th	25 th	Med.	75 th	25 th	Med.	75 th	
Age (years)	38.0	54.0	66.0	49.8	60.0	65.5	56.0	63.0*	73.5	<0.001**

Values expressed as median and interquartile range (1st quartile 25th and 3rd quartile 75th).

n = number of participants; GSR = general diet without restriction; GDM = general diet for glycemic control; GHSS = general low-sodium diet; * p-value ≤ 0.05 indicates significant difference between groups by Kruskal-Wallis test; ** p-value ≤ 0.05 indicates significant difference compared to the GSR group by Mann-Whitney test with Holm-Sidak post-hoc correction.

Table 3. List of the main diagnoses of the interviewed individuals, adults and older adults, categorized according to ICD-10. Marília, SP, 2019.

Chapters	Diseases	Adult <i>f</i> (%)	Older adult <i>f</i> (%)
I	Some infectious and parasitic diseases	3 (1.6)	1 (0.5)
II	Neoplasms [tumors]	12 (6.5)	19 (10.3)
III	Diseases of the blood and Hematopoietic organs and certain disorders involving the immune mechanism	3 (1.6)	3 (1.6)
IV	Endocrine, nutritional, and metabolic diseases	4 (2.2)	10 (5.4)
V	Mental and behavioral disorders	1 (0.5)	1 (0.5)
VI	Diseases of the nervous system	1 (0.5)	2 (1.1)
VII	Diseases of the eye and adnexa	3 (1.6)	1 (0.5)
IX	Diseases of the circulatory system	42 (22.7)	49 (26.5)
X	Diseases of the respiratory system	15 (8.1)	16 (8.6)
XI	Diseases of the digestive system	13 (7.0)	15 (8.1)
XII	Diseases of the skin and subcutaneous tissue	12 (6.4)	7 (3.8)
XII	Diseases of the musculoskeletal system and connective tissue	8 (4.3)	9 (4.9)
XIV	Diseases of the genitourinary system	11 (5.9)	14 (7.6)
XVIII	Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified	6 (3.2)	0 (0.0)
XIX	Injuries, poisoning, and certain other consequences of external causes	52 (28.1)	35 (18.9)
XX	External causes of morbidity and mortality	0 (0.0)	3 (1.6)

Values expressed in absolute frequency (N) and relative frequency (%).

Overall, the perception of the quality of hospital diet was positive among participants, regardless of the prescribed diet type, with the majority being rated as Good/Excellent (Table 4). Among adults, 82.7% received the GSR diet, 5.4% received the GDM diet, and 11.8% received the GHSS diet, while among older adults, 68.1% received the GSR diet, 8.6% received the GDM diet, and 23.2% received the GHSS diet.

The quantity of the meal offered was evaluated as Poor/Fair by 13.7% of adults with the GSR diet and 27.3% of those with the GHSS diet, as they considered it to be small. Among older adults, 18.3% of participants with the GSR diet and 25.0% of those with the GDM diet also expressed dissatisfaction with the quantity, but considered it to be excessive. On the other hand, the appearance and temperature of the preparations were evaluated as Good/Excellent by

the majority of participants, regardless of age. These categories did not show a significant association with the prescribed diet (Table 4).

Participants' perception regarding meal timing, hygiene, and the possibility of substitutions also did not show a significant association with the diet. However, for older adults, the taste of the hospital diet category was significantly associated with the prescribed diet. Thus, the perception of older adults about the taste of GHSS and GDM diets was negative for 30.2% and 25.0% of participants, respectively. For adults, 27.3% of participants receiving the GHSS

diet and 20.0% of those with the GDM diet also reported dissatisfaction with the taste of the meals. However, in this group, there was no significant association with the diet (Table 4).

The data also showed that the type of diet did not significantly affect the appetite and salivation of the participants. However, the assessment regarding the desire to eat during hospitalization showed that 37.9% of adults without any dietary restrictions perceived their appetite as reasonable. Among older adults, 35.7% of those receiving the GSR diet also considered their appetite as reasonable (Table 5).

Table 4. Analysis of absolute frequency (f) and relative frequency (%) distribution of categories of perception of hospital food regarding the prescribed diet type among participating adults and older adults. Marília, SP, 2019.

Categories	Adult			p-value	Older adult			p-value
	GSR (n = 153)	GDM (n = 10)	GHSS (n = 22)		GSR (n = 126)	GDM (n = 16)	GHSS (n = 43)	
Appearance								
Poor/Fair	8 (5.2)	1 (10.0)	2 (9.1)	0.405	6 (4.8)	1 (6.3)	2 (4.7)	0.998
Good/Excellent	145 (94.8)	9 (90.0)	20 (90.9)		120 (95.2)	15 (93.8)	41 (95.3)	
Quantity								
Poor/Fair	21 (13.7)	1 (10.0)	6 (27.3)	0.139	23 (18.3)	4 (25.0)	5 (11.6)	0.403
Good/Excellent	132 (86.3)	9 (90.0)	16 (72.7)		103 (81.7)	12 (75.0)	38 (88.4)	
Temperature								
Poor/Fair	17 (11.1)	0 (0.0)	1 (4.5)	0.227	13 (10.3)	1 (6.3)	5 (11.6)	0.881
Good/Excellent	136 (88.9)	10 (100.0)	21 (95.5)		113 (89.7)	15 (93.8)	38 (88.4)	
Taste								
Poor/Fair	24 (15.7)	2 (20.0)	6 (27.3)	0.175	21 (16.7)	4 (25.0)	13 (30.2)	0.050*
Good/Excellent	129 (84.3)	8 (80.0)	16 (72.7)		105 (83.3)	12 (75.0)	30 (69.8)	
Meal timing								
Poor/Fair	21 (13.7)	4 (40.0)	3 (13.6)	0.575	6 (4.8)	2 (12.5)	2 (4.7)	0.872
Good/Excellent	132 (86.3)	6 (60.0)	19 (86.4)		120 (95.2)	14 (87.5)	41 (95.3)	
Hygiene								
Poor/Fair	1 (0.7)	0 (0.0)	0 (0.0)	0.662	0 (0.0)	0 (0.0)	0 (0.0)	-
Good/Excellent	152 (99.3)	10 (100.0)	22 (100.0)		126 (100.0)	16 (100.0)	43 (100.0)	
Substitution								
Poor/Fair	67 (43.8)	6 (60.0)	9 (40.9)	0.998	36 (28.6)	5 (31.3)	9 (20.9)	0.372
Good/Excellent	86 (56.2)	4 (40.0)	13 (59.1)		90 (71.4)	11 (68.8)	34 (79.1)	

n = number of participants; GSR = general diet without restriction; GDM = general diet for glycemic control; GHSS = general low-sodium diet. *p-value ≤ 0.05 indicates significant association with the type of prescribed diet by the chi-square test.

Table 5. Analysis of absolute frequency (f) and relative frequency (%) distribution of appetite and salivation categories by prescribed diet type among participating adults and older adults. Marília, SP, 2019.

Categories	Adult			<i>p-value</i>	Older adult			<i>p-value</i>
	GSR (n = 153)	GDM (n = 10)	GHS (n = 22)		GSR (n = 126)	GDM (n = 16)	GHSS (n = 43)	
Appetite	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)		<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)	
Poor	8 (5.2)	0 (0.0)	1 (4.5)	0.277	9 (7.1)	1 (6.3)	2 (4.7)	0.261
Reasonable	58 (37.9)	3 (30.0)	6 (27.3)		45 (35.7)	6 (37.5)	12 (27.9)	
Preserved	87 (56.9)	7 (70.0)	15 (68.2)		72 (57.1)	9 (56.3)	29 (67.4)	
Salivation	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)		<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)	
Reduced	35 (32.7)	1 (12.5)	7 (41.2)	0.750	37 (40.7)	3 (33.3)	12 (46.2)	0.686
Increased	3 (2.8)	1 (12.5)	0 (0.0)		0 (0.0)	0 (0.0)	0 (0.0)	
Maintained	69 (64.5)	6 (75.0)	10 (58.8)		54 (59.3)	6 (66.7)	14 (53.8)	

n = number of participants; GSR = general diet without restriction; GDM = general diet for glycemic control; GHSS = general low-sodium diet.

From the qualitative analysis of participants' testimonials, categorized by the prescribed diet type, three thematic categories were defined:

Hospital Diet for Health Improvement

Regardless of the prescribed diet and age, participants associated the hospital diet as necessary for health recovery, characterizing it as a supervised meal distinct from what they consumed at home:

"It is food for us to become strong, strengthened [...]" (Older Adult, GHSS).

"A meal that sustains the patient [...]" (Adult, GHSS).

Participants also mentioned that meal times are always respected in the hospital, being important for proper recovery:

"To eat better, because at home we don't do that, lunch, coffee, no, I don't do it, the times correct" (Adult, GSR).

In individuals prescribed with restrictive diets, it was evident that the main difficulty is the lack of salt in the meal. This fact was highlighted among older adults with GHSS diet and even with GSR when compared to adults with the same diets:

"... but for me, it doesn't work, the lack of salt, I can't eat" (Older Adult, GHSS).

"I thought it was more seasoned [...] it's not bad, the matter is the salt" (Adult, GHSS).

The Mythification of Hospital Diet

Among adults and older individuals, regardless of the received diet, recurring testimonials brought deep-seated prejudices about hospital diet, qualifying it as bad, tasteless, and bland. However, with the experience of the meal, there was a deconstruction of this stigma:

"I've heard it's bad, that it's hospital food, I've always eaten here in the clinics, it's always been tasty" (Older Adult, GHSS).

Other reports brought the perception that in the past hospitals offered food that did not add nutritional value to the patient, but that currently there is supervision by nutritionists, which ensures higher quality meals:

"The nutritionist will see what people need [...] vegetables, because there's a lot of chayote, for those who need to be hospitalized, it's good" (Adult, GSR).

Economic status and religiosity also emerged in the testimonials, especially among older individuals, who value the food received:

"Sometimes we talk about the food, but for me, food is sacred" (Older Adult, GDM).

(Dis)knowledge regarding the prescribed diet

Some adults and older individuals were aware of the diet they were receiving, especially the groups with GHSS and GDM diets:

"Because you can't eat salt, otherwise the blood pressure goes up" (Older Adult, GHSS).

"Because I have high diabetes, it needs to be controlled, sometimes it's high, sometimes it's okay, but it won't go down" (Adult, GDM).

Others did not have discernment about the prescribed diet or their health condition:

"I don't know, to me it's coming as usual, I also don't like to eat salty food" (Older Adult, GHSS).

The lack of knowledge and the scarcity of access to health information worsen in participants with a misconceived view of their illness and a lack of understanding of how to control its consequences in their daily lives:

"The doctor didn't say anything, a little salt because of diabetes, what's that? I don't know. The doctor said I can't eat too much salt; said I can't eat "ajinomoto" (monosodium glutamate). "Ajinomoto" doesn't have any salt, right? I use Shoyu (soy sauce) more on salads, just some" (Older Adult, GHSS).

DISCUSSION

The data showed that regardless of age and prescribed diet, participants positively evaluated the meals received during hospitalization. However, the negative perception of the diet's taste was significantly associated with restrictive diets among older individuals. It could be inferred that participants understand the importance of hospital diet as a means of health recovery, but the prejudiced view of the meal is still noticeable.

Indeed, categories such as the appearance, quantity, and temperature of the meal, hygiene of the nutrition service, possibility of substitutions, and meal times were well received. Furthermore, patients acknowledged that the hospital adheres strictly to dietary prescriptions and schedules. Although there was no significant association between age group and prescribed diet for these categories, the proportion of the Poor/Fair satisfaction level for some of them deserves attention. The substitution category showed proportions of 40 to 60% of Poor/Fair satisfaction among adults and 20 to 31% among older individuals, especially for patients with the GDM diet. The quantity, taste, and timing categories also showed percentages of Poor/Fair satisfaction among adults that deserve attention, especially the quantity and taste of the GHSS diet and the timing of the GDM diet. For older individuals, the most impactful percentages of Poor/Fair satisfaction were the taste in the GHSS diet and the quantity and timing in the GDM diet.

The data regarding meal quantity corroborate with the qualitative analysis, where patient dissatisfaction with the portion served was observed. Older patients considered this quantity to be excessive, expressing indignation at wasting food. Conversely, for several adults, the quantity was insufficient to feel satiated.

Considering that taste was the only category that showed a significant association with the prescribed diet, but only for older individuals, it was indeed found that restrictive diets interfere with the overall perception of the older person about the diet offered in the hospital and in the pleasure of eating.

Older individuals showed a higher proportion of prescription for GDM and GHSS diets. This

occurrence is related to the prevalence of DM and hypertension among older people. These chronic diseases require specific dietary intervention, especially in the hospital environment, as they are strongly related to inadequate dietary behaviors throughout life²³⁻²⁵.

In older population, lifestyle habits involving sedentary behavior, alcoholism, smoking, and inappropriate dietary routines, as well as the fact that older individuals sometimes live alone and have difficulty cooking, reflect greater difficulty in modifying dietary behavior. Thus, when faced with hospitalization and a strict nutritional therapy for disease control, they feel the difference in the food served^{23,24}. Furthermore, aging itself imposes limitations on older individuals that compromise their nutrition^{10,13}, especially when associated with NCDs. Regarding taste, studies associate aging with a decline in the ability to detect basic flavors when compared to adults²⁵⁻²⁷. Therefore, it is inferred that if older individuals have dietary habits for sodium and/or glycemic control in the home environment, their perception of the taste of hospital food could be more satisfactory.

The findings reinforce the relevance of public health research that seeks different approaches to hospital diets for older adults, including health promotion measures and prevention of health complications, consequently reducing hospitalizations. However, it is emphasized that the greater effectiveness of health actions for a population that is aging depends on nutritional education starting early in life. This education should be maintained over the years as a lifelong learning process, considering that part of the NCDs arise from or present complications due to inadequate nutrition, either due to lack of knowledge or the individual's lifestyle habits.

In the current state, improvements are already being made in technologies such as the development of tools to identify the most suitable nutritional therapy for older adults, considering that this demographic requires accessible and appropriate communication, often overlooked²⁸. There are also studies highlighting the importance of a specialized

menu for older adults, considering their sensory losses that interfere with food choices, aiming to minimize interference in social interactions²⁹ and their health. Thus, improving the acceptance, especially of restrictive diets. However, ensuring quality, nutritionally safe nutrition is directly related to the training of involved staff, in addition to the supervision of the nutritionist at every stage of meal production. This specialized form of supervision has brought higher standards to hospital food and nutrition services, prompting individuals to reconsider their opinion about meals, often regarded as inadequate.

The appetite and salivation of participants during hospitalization were also evaluated, with no significant association found regarding age and diet. Although the majority of participants considered their appetite and salivation preserved, others reported having reasonable appetite and reduced salivation. Especially for older population, the relationship between declining taste sensitivity and food intake is not very clear. However, it is known that there is a reduction in salivary flow, which can affect saliva production^{31,32}. Thus, the preparation of the diet, its presentation, and clearer, illustrative instructions with accessible vocabulary for this audience about the importance of consuming what has been prescribed are potential enhancers for food acceptance. The entire multidisciplinary team involved in hospital care for older adults should be part of this process, with the nutritionist serving as a facilitator in this dialogue.

In the testimonials, it was observed that both age groups have the same perception of hospital diets regarding their importance and significance for health. Additionally, they acknowledged that meal times serve as a standard to be followed at home. They recognized that this diet is essential for health recovery and is part of the treatment. More than adults, older adults value the offered food and even attribute a sacred value to it. The reports also showed, corroborating with the quantitative data, that the most significant interfering factor for older adults is the taste of meals, especially with a low-sodium diet. Such data reinforce the difficulty of older adults in accepting hospital diets, which can negatively influence their health and well-being

recovery. Since the individual's nutritional status is directly associated with the recovery process, a low food intake during hospitalization can lead to malnutrition, which, due to factors associated with aging itself, can present a more abrupt condition⁴.

It became evident that hospital diet, even in present days, is mystified by the population as being tasteless, bland, cold, and only offering soups. However, it was noticed that it is after tasting it that the ingrained perception in society changes. Therefore, it is relevant to plan actions to improve the acceptance of hospital diets, aiming to add greater satisfaction and enjoyment to meals, thus becoming an important tool in patients' recovery.

It was also evident that the majority of participants have knowledge about the diet they received and their health condition. On the other hand, others did not understand their current illness and treatment, reinforcing the importance of health education interventions during hospitalizations.

Although this study provides representation of a significant contingent of hospitalized individuals in a hospital in the interior of São Paulo, its limitation relates to the diversity of dietary cultures and hospital services found in Brazil, which may determine different feeding experiences. In other regions of the country, new outcomes regarding the perception of hospital diet quality, especially among older adults, may be encountered.

CONCLUSION

Regardless of the diet, older adults and hospitalized adults consider the quality of hospital food satisfactory, except for the taste, which showed a significant association with the diet received, particularly among older adults. The quantity, timing, and substitution of the diet, although not significant, presented percentages of Poor/Fair perception that indicate the need for intervention to contribute to greater adherence to dietary therapy.

The reports from hospitalized participants reinforce their dietary habits, which represent barriers to nutritional therapy and exacerbate cardiovascular diseases. The excessive use of salt in homemade meals stands out, a factor that may be associated with the profile of the studied population, which is often characterized by low levels of education and income. This highlights the even greater necessity for nutritional education.

This study advances by providing evidence regarding the unique aspects of hospital diets for older population, with or without dietary restrictions. It aims to support strategies aimed at improving the quality, adequacy, and acceptance of the food offered, thereby contributing to the nutrition of hospitalized older adults and, consequently, to the recovery process and reduction of hospitalization time.

ACKNOWLEDGMENTS

The authors would like to express their gratitude to the professionals from the Food and Nutrition Unit of the research hospital and the participating patients.

AUTHORSHIP

- Leticia Aeko Barone Ozawa - Conception and design; analysis and interpretation of qualitative data; approval of the version to be published.
- Eduardo Federighi Baisi Chagas - Design, analysis, and interpretation of quantitative data.
- Joyce Fernanda Soares Albino Ghezzi - Writing and revision of the paper; approval of the version to be published.
- Maria Angélica Spadella - Responsible for all aspects of the work, ensuring the accuracy or integrity of any part of the manuscript.

Edited by: Marquiony Marques dos Santos

REFERENCES

1. Godoy AM, Lopes DA, Garcia RWD. Transformações socioculturais da alimentação hospitalar. *Hist Ciênc Saúde-Manguinhos*. 2007;14(4):1197-1215. Available from: <https://doi.org/10.1590/S0104-59702007000400006>
2. Abreu ES, Spinelli MGN, Pinto AMS. *Gestão de Unidades de Alimentação e Nutrição: um modo de fazer*. Edição 7, 2019.
3. Cattani A, Eckert IC, Brito JE, Tartari RF, Silva FM. Nutritional risk in critically ill patients: how it is assessed, its prevalence and prognostic value: a systematic review. *Nutr Rev*. 2020;78(12):1052-1068. Available from: <https://doi.org/10.1093/nutrit/naaa031>
4. Lopes JKSC, Santos TOCG, Mendonça XMFD, Campos JSP, Caldas SP, Moura FML, et al. Análise dos indicadores de qualidade das dietas ofertadas a pacientes oncológicos. *Mundo da Saúde*. 2020;44:397-411, e0222020. Available from: https://bvsm.sau.gov.br/bvs/periodicos/mundo_saude_artigos/analise_qualidade_dietas_oncologicos.pdf
5. Souza MCGC, Mendes ALRF, Santos GCM, Brito FCR, Moraes VD, Silva FR. Estado nutricional e aceitação da dieta por pacientes cardiopatas. *Motricidade*. 2018;14(1):217-225. Available from: <https://scielo.pt/pdf/mot/v14n1/v14n1a31.pdf>
6. Menezes ROS, Nascimento LJ, Câmera PPC, Sousa UH. Estudo da adequação de refeições servidas a pacientes em hospital de referência na cidade de Salvador, BA. *Higiene Alimentar*. 2018;32:276-277. Available from: <https://docs.bvsalud.org/biblioref/2018/04/882940/276-277-site-37-42.pdf>
7. Demario RL, Sousa AA, Salles RK. Comida de hospital: percepções de pacientes em um hospital público com proposta de atendimento humanizado. *Ciênc Saúde Colet*. 2010;15(suppl 1):1275-1282. Available from: <https://doi.org/10.1590/S1413-81232010000700036>
8. Lima DF, Barlem ELD, Santos SSC, Tomaschewski-Barlem JG, Ramos AM, Mattos KM. Avaliação dos fatores que dificultam a alimentação de idosos hospitalizados. *Rev Rene*. 2014;15(4):578-584. Available from: <https://www.redalyc.org/pdf/3240/324032212004.pdf>
9. Reis CCA, Sena ELS, Menezes TMO. Vivências de familiares cuidadores de pessoas idosas hospitalizadas e a experiência de interculturalidade. *Esc Anna Nery*. 2016;20(3): e20160070. Available from: <https://doi.org/10.5935/1414-8145.20160070>
10. Giro AJNS, Paúl C. Envelhecimento sensorial, declínio cognitivo e qualidade de vida no idoso com demência. *Actas Gerontol*. 2013;1(1):1-10. Available from: file:///C:/Users/User/Downloads/Envelhecimento_Sensorial_Declinio_Cognit.pdf
11. Kreuz G, Franco MHP. O luto do idoso diante das perdas da doença e do envelhecimento – Revisão Sistemática de Literatura. *Arq Bras Psicol*. 2017;69(2):168-186. Available from: http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S1809-52672017000200012&lng=pt.
12. Cardoso MCAF, Bujes RV. A saúde bucal e as funções da mastigação e deglutição nos idosos. *Estud Interdiscip Envelhec*. 2010;15(1):51-65. Available from: <https://seer.ufrgs.br/RevEnvelhecer/artic/view/9580/10909>
13. Sera EAR, Osório NB, Ribeiro EM, Neto LSS. Avaliação de saúde bucal em idosos da Universidade da Maturidade: estudo transversal. *Arch Health Invest*. 2021;10(3):436-441. Available from: <https://doi.org/10.21270/archi.v10i3.5138>
14. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. *Envelhecimento e saúde da pessoa idosa – Brasília: Ministério da Saúde [online]*. 2006. Available from: http://bvsm.sau.gov.br/bvs/publicacoes/envelhecimento_saude_pessoa_idosa_n19.pdf
15. Pires CB, Costa GS, Borges IS, Castro SZ, de Oliveira E, Nobre MCO, et al. Xerostomia, Alteração do Paladar, da Saliva e da Sede: Percepção dos Idosos. *RUC* 2020;22(1):1-15. Available from: <https://doi.org/10.46551/ruc.v22n1a02>
16. Neumann L, Schauren BC, Adami FS. Taste sensitivity of adults and elderly persons. *Rev Bras Geriatr Gerontol*. 2016; 19(5):797-808. Available from: <https://doi.org/10.1590/1809-98232016019.150218>
17. Lima DF, Pelzer MT, Barros EJL, Semedo DSRC, Rosales RA. Factores que dificultan la alimentación por vía oral del anciano hospitalizado. *Enferm Glob*. 2017;16:429-64. Available from: <https://dx.doi.org/10.6018/eglobal.16.4.271841>
18. Fontanella BJB, Ricas J, Turato ER. Amostragem por saturação em pesquisas qualitativas em saúde: contribuições teóricas. *Cad Saúde Pública*. 2008;24:17-27. Available from: <https://doi.org/10.1590/S0102-311X2008000100003>
19. Brasil. Associação Brasileira de Empresas de Pesquisa. *Critério Brasil [online]*. 2015. Available from: <https://www.abep.org/Servicos/Download.aspx?id=09>

20. Lorencet JS, Selbmann K, Morimoto IMI, Marina Lopes M, Polakowski CB. O conceito de qualidade do cliente aplicado ao serviço de alimentação e nutrição de hospital oncológico. *Rev. Elet. Gestão e Serviços*. 2021;12(1): 3303-3318. Available from: <https://www.metodista.br/revistas/revistas-metodista/index.php/REGS/article/view/10522/8005>
21. Minayo MCS. O desafio do conhecimento: pesquisa qualitativa em saúde. Edição 13, 2013.
22. Brasil. Ministério da Saúde. DATASUS: Morbidade hospitalar do SUS - CID-10 [online]. Acesso em 2 Jan 2020. Available from: <http://tabnet.datasus.gov.br/cgi/sih/mxcid10lm.htm>.
23. Alves KJQ, Lemos JOM. Avaliação do consumo alimentar e fatores de risco para doenças crônicas não transmissíveis do grupo de idosos de um CRAS do sertão de Pernambuco. *Rev Bras Cienc Saúde*. 2019;23(2):163-172. Available from: <https://docs.bvsalud.org/biblioref/2019/08/1010302/30506-113566-1-pb.pdf>
24. Carvalho TC, Valle AP, Jacinto AF, Prefeito VFS, Boas PJFV. Impacto da hospitalização na capacidade funcional de idosos: um estudo de coorte. *Rev Bras Geriatr Gerontol*. 2018;21(2):134-142. Available from: <http://dx.doi.org/10.1590/1981-22562018021.170143>
25. Tonini IGO, Luz FR, Menon PD, Zanelatto C, Mazur CE. Percepção da saúde e estado nutricional de pacientes hospitalizados com doenças crônicas. *ABCS Health Sci*. 2019; 44(1):3-8. Available from: <https://docs.bvsalud.org/biblioref/2019/05/995002/44abcs3.pdf>
26. Lobato TAA, Silva TO, Correa LSG, Ainett WSO, Roza AK. Improving risk management in the distribution of hospital diets by oral. *Nutr Clín Diet Hosp*. 2019;39(1):141-145. Available from: <https://revista.nutricion.org/PDF/LOBATO.pdf>
27. Barragán R, Coltell O, Portolés O, Asensio EM, Sorlí JV, Ortega-Azorín C, et al. Bitter, sweet, salty, sour and umami taste perception decreases with age: sex-specific analysis, modulation by genetic variants and taste-preference associations in 18 to 80 year-old subjects. *Nutrients*. 2018;10(10):1539. Available from: <https://doi.org/10.3390/n10101539>
28. Nascimento Neto FC, Gonçalves KG, Boto EG, Matos TA. Guia prático de terapia nutricional para nutricionistas que atuam com idosos hospitalizados: validação de um instrumento de saúde. *Nursing (São Paulo)*. 2019;22(254):3043-3046. Available from: <https://doi.org/10.36489/nursing.2019v22i254p3043-3046>
29. Gaspar TV, Ávila JMT, Varela-Moreiras G. Educación para una gastronomía saludable: retos y oportunidades en la alimentación institucional. *Nutr Hosp*. 2018;35 (spe4):56-60. Available from: http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S0212-16112018000700011&lng=es
30. Gomes DRP, Schirmer CL, Nolte AOA, Bós AJG, Venzke JG. Avaliação do paladar de idosos e sua relação com estado nutricional e hábitos alimentares. *PAJAR*. 2020;8(1):e37707. Available from: <http://dx.doi.org/10.15448/2357-9641.2020.1.37707>
31. Muñoz-González C, Vandenberghe-Descamps M, Feron G, Canon F, Labouré H, Sulmont-Rossé C. Association between Salivary Hypofunction and Food Consumption in the Elderlies. A Systematic Literature Review. *J Nutr Health Aging*. 2018;22(3):407-419. Available from: <https://doi.org/10.1007/s12603-017-0960-x>
32. Silva HPR, Koppe B, Brew MC, Sória GS, BavareSCO CS. Abordagem das afecções bucais mais prevalentes em idosos: uma revisão integrativa com foco na atenção primária. *Rev Bras Geriatr Gerontol*. 2017; 20(3):430-440. Available from: <http://dx.doi.org/10.1590/1981-22562017020.160199>

