





Adherence of polymedicated older adults: how do they behave regarding medication intake?

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Abstract

Objective: To analyze the association between medication therapy adherence and level of understanding and complexity of the prescription, as well as to assess the agreement between two adherence questionnaires administered to polymedicated older adults. **Method:** This is a cross-sectional study involving older adults attending the geriatrics outpatient clinic at a university hospital in Rio de Janeiro, Brazil. In these patients, medication therapy adherence (assessed using the Brief Medication Questionnaire - BMQ and the Instrument for Assessing Attitudes Toward Medication Taking - IAAFTR), knowledge about prescribed medications, and pharmacotherapy complexity were evaluated. Statistical analysis was conducted using Chi-square tests and Fisher's Exact test, with a significance level set at $p\text{-value} \leq 0.05$. The agreement between the two adherence methods was assessed using the Kappa index. **Results:** Of the 49 interviewed older adults, 75.5% were women, with arterial hypertension (82%) and diabetes (37%) being the most prevalent conditions. According to the BMQ and IAAFTR tests, 35% and 45% of patients, respectively, were adherent to medication therapy. There was no agreement in the results between the adherence methods. A large proportion of patients exhibited a good level of information about their medications; however, the majority of them were considered non-adherent. No statistically significant association was observed between prescription complexity and

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adherence, nor between the level of medication information and adherence. *Conclusion:* Medication therapy adherence is a multifactorial process, and the assessment tools for adherence and other influencing factors should be carefully chosen according to the study population, as they exhibited different responses in our work.

INTRODUCTION

Older adults commonly present with multiple comorbidities, often leading to prescriptions for multiple medication therapies. The prevalence of clinical manifestations and chronic diseases stemming from aging itself contributes to the practice of polypharmacy, which involves the use of five or more medications¹. This practice can result in a higher prevalence of adverse reactions, drug interactions, and therapy non-adherence².

Therefore, it is important for older adults to have proper management regarding medication intake, as several studies have shown a relationship between therapy complexity and patient health knowledge with the likelihood of lower medication adherence³. The research conducted by Schönfeld, Pfisterer-Heise, and Bergelt³ indicates that health education is positively associated with medication therapy adherence and that the cognitive capacity of older individuals also plays a significant role in adherence.

The term medication therapy adherence is defined by the World Health Organization (WHO) as "the patient's agreement with the healthcare provider's advice regarding medication intake, adherence to the diet, and/or implementation of lifestyle changes"⁴. Therefore, it is of great importance for older adults to adhere to medication therapy in order to achieve their therapeutic goals⁵.

Another crucial point is the complexity of medical prescriptions, which can lead to a high rate of misunderstanding regarding pharmacotherapy. Therefore, healthcare services need to implement strategies that enhance the quality of guidance provided by the professionals involved in care, so that older adults can achieve medication therapy adherence and, consequently, greater therapeutic success, positively impacting their quality of life⁶.

There are several methods aimed at measuring medication use; however, the "gold standard" is serum dosage, which is a direct method of assessing adherence. Nonetheless, due to its high cost, it is not always feasible to perform^{4,7}. Direct and/or indirect methods are used to measure adherence. Some examples of indirect measures of adherence include interviews and questionnaire administrations, which are susceptible to memory bias or the patient's willingness to contribute. To minimize this, the information resulting from the interview or questionnaire is scored using scales, which transform such data into measurable items⁸.

Several factors can influence medication therapy adherence, such as the understanding and complexity of the medical prescription. It is believed that the more complex the prescription, the lower the adherence to medication therapy⁹.

Although many methods for measuring medication therapy adherence have been validated, such as the Brief Medication Questionnaire (BMQ)¹⁰ and the Instrument for Assessing Attitudes Toward Medication Taking (IAAFTR)¹¹, and they all share the same objective, it is unknown whether they are interchangeable. However, to date, no studies have been found in the literature that compare two or more of these methods.

It is known that adherence to medication therapy is complex and multifactorial, and its measurement is necessary to positively assist in patient therapy. However, the assessment of adherence through indirect methods, which are less costly, may yield responses that are not reliable with reality. Therefore, are indirect methods of adherence, particularly patient-administered questionnaires, interchangeable? Do they yield similar responses? Another important point in this process is the complexity of medication therapy, as complex prescriptions lead to lower treatment adherence⁹.

However, can we establish a quantitative association between these parameters?

Thus, this study aimed to analyze the association between medication therapy adherence and the level of understanding and complexity of the prescription, as well as to evaluate the agreement between two adherence questionnaires in polypharmacy older adults.

METHOD

This is a descriptive cross-sectional study, targeting older adults who are polymedicated and receive care at the geriatrics outpatient clinic of a university hospital in Rio de Janeiro (RJ), Brazil.

The geriatrics outpatient clinic conducts health promotion and disease prevention activities with older adults and their caregivers. It has a multidisciplinary team composed of physicians, nurses, social workers, psychologists, nutritionists, physiotherapists, speech-language pathologist, and pharmacists.

The study included older adults aged 60 years or older, polymedicated, with a minimum of two comorbidities under treatment. Patients in palliative care, with compromised autonomy, and/or participating in conflicting studies at the time of invitation were excluded. Compromised autonomy was identified based on the physician's report through consultation of medical records.

A convenience sample was employed, and data collection took place in the pharmaceutical office from December 2021 to July 2022, through semi-structured interviews following routine medical consultations. The pharmaceutical consultation lasted an average of 30 minutes. All patients who had a medical consultation during the study period and met the inclusion criteria were invited to participate.

Sociodemographic data (sex, age group, living arrangement, employment status, education, and monthly income), comorbidities, and medication therapy information were collected. Additionally, questionnaires were administered by a trained pharmacist to assess adherence and older adults' knowledge regarding medical prescriptions.

Assessment of medication therapy adherence was conducted through two indirect methods: the Brief Medication Questionnaire (BMQ), translated and validated into Portuguese¹⁰, and the Instrument for Assessing Attitudes Toward Medication Taking (IAAFTR), validated in Portuguese¹¹. Furthermore, the Medication Prescribed Information Level questionnaire¹² was also employed to measure knowledge about the prescription. All questions from these three tools were directly asked to the research participants during the pharmaceutical consultation. To evaluate the complexity of prescriptions, the Pharmacotherapy Complexity Index (PCI), translated and validated into Portuguese, was utilized^{13,14}.

The BMQ instrument for assessing medication adherence level is a scale comprised of closed-ended questions divided into three domains: Part I (Regimen) - Evaluates the patient's behavior regarding adherence to the prescribed treatment regimen, for instance, by asking which medications and doses the patient took in the last week; Part II (Belief) - Assesses patients' beliefs in the effectiveness of the treatment and opinions about adverse effects, for example, by asking the patient if any medication they take causes discomfort. Part III (Recall) - Asks the patient about the difficulty in remembering to take the medications. Individually, if the score is equal to or greater than one in any domain, it indicates a potential risk for non-adherence to medication treatment. Additionally, when analyzing the sum of the three domains, the classification is as follows: adherence, comprising all patients who did not score in any of the domains; probable adherence, when the patient had a positive response in one of the domains; probable low adherence, if they had a positive response in two different domains; and low adherence, when all domains scored¹⁰.

The IAAFTR assesses attitudes toward medication taking and consists of ten structured questions with affirmative or negative responses. The proposed cutoff score for this study, based on the authors Strelec et al.¹¹, is seven, with scores equal to or less than seven indicating negative attitudes (non-adherence), and scores greater than seven indicating positive attitudes (adherence)¹¹.

The Medication Prescribed Information Level questionnaire¹² consists of questions about the prescribed medication's name, indication, dose, administration frequency, treatment duration, precautions, and adverse reactions, analyzing the patient's level of knowledge about their prescription. In this questionnaire, responses are assigned points, resulting in a total score of 10, distributed as follows: two points for correctly identifying the medication's name, dose, and administration frequency, and one point for accurately stating the treatment duration, therapeutic indication, adverse effects, and precautions.

For statistical analysis, we adapted the cutoff point from the paper by Silva et al.¹². In their study, the authors classify understanding of the prescription into three categories: good (10 and 9 points), fair (8 to 6 points), and insufficient (less than 6 points). In our study, we considered two groups: good, with a score of 9 and 10 points, and poor, equal to or less than 8 points.

Regarding the PCI, the tool is divided into three sections that assess: pharmaceutical forms (32 items); dosage frequency (23 items); and additional information related to medication use (10 items). Each section was scored by analyzing the patient's prescription, and the total complexity index was obtained by summing the scores from the three individual sections¹⁴. In this case, prescriptions scoring higher than 16.5 were considered complex, as established in the study by Pantuzza et al.¹⁵.

Descriptive statistical analysis was performed with the presentation of frequency tables for categorical variables. Additionally, the agreement between the two adherence questionnaires (BMQ and IAAFTR) was evaluated by calculating the Kappa coefficient. Bivariate analyses were conducted between adherence (dependent variable) and the Medication Prescribed Information Level (independent variable); and between adherence and the Medication Prescribed Information Level (dependent variables) and the Pharmacotherapy Complexity Index (independent variable) using Pearson's chi-square test or Fisher's exact test, with a significance level of 5% ($p \leq 0.05$).

All participants were informed about the research objectives and the confidentiality of their data, and

they signed the Informed Consent Form. The study was approved by the Research Ethics Committee of the Universidade Estadual do Rio de Janeiro under protocol number: 5,041,163.

DATA AVAILABILITY

The dataset is not publicly available due to information compromising the privacy of the participants in the respective research.

RESULTS

The sample consisted of 49 older adults attended by the pharmacist during the study period. The majority of research participants were female (75.5%), with a mean age of 76.6 years, ranging from 63 to 91 years old. Of these, 71.4% reported living alone, and 95.9% were retired. Regarding educational attainment, it was observed that 57.1% had completed primary education, and they had a monthly salary income equivalent to one minimum wage (67.3%). Among the main non-communicable chronic diseases found in the older adults who participated in the study, 33.3% had systemic arterial hypertension (SAH), and 22.4% had diabetes (Table 1).

A total of 342 medications were prescribed, with a mean of 6.98, a median of 7, and a standard deviation of 1.7 medications per patient. There was a predominance of medications for the cardiovascular system, nervous system, and endocrine diseases, which together accounted for 66% of the prescribed medications.

To assess medication therapy adherence, two questionnaires were administered: the BMQ and the IAAFTR. The BMQ categorized the older adults into: low adherence (49%); probable low adherence (24%); probable adherence (31%); and adherence to medication therapy (4%). Patients with probable adherence or adherence were considered adherent, totaling 35%, according to the overall classification.

Regarding the adherence measure through the application of the IAAFTR, 94% reported that they take their medications with them when traveling; however, 78% do not make notes regarding

medication schedules to know the correct time to take them. Through this evaluation, it was found that 45% of older adults had adherence to medication therapy.

When comparing the adherence questionnaires (BMQ and IAAFTR), it was found that the results were statistically different. It can be observed that in

only 30.6% of the observations, the questionnaires agreed on non-adherence, and in only 18.4%, they agreed on adherence. Hence, the overall agreement that both groups achieved was 49%. Furthermore, the Kappa coefficient was calculated, resulting in -0.002, indicating that the two questionnaires do not agree when measuring medication therapy adherence in polymedicated older adults (Table 2).

Table 1. Sociodemographic and economic profile of older adult patients at the Elderly Care Center (NAPI - Núcleo de Atenção à Pessoa Idosa). (N=49). Rio de Janeiro, RJ, 2022.

Variables	N (%) *
Sex	
Female	37 (75,5)
Male	12 (24,5)
Age group (years)	
Maximum and Minimum	
60-69	7 (14,3)
70-79	26 (53,0)
80-89	14 (28,6)
90 or more	2 (4,1)
Living alone?	
No	14 (28,6)
Yes	35 (71,4)
Employment Status	
Retired	47 (95,9)
Other	2 (4,1)
Education	
Illiterate	4 (8,2)
Primary	28 (57,1)
Secondary	14 (28,6)
Higher	3 (6,1)
Monthly Income	
1 salary	33 (67,3)
2 salaries	11 (22,4)
3 salaries or more	5 (10,3)
Non-communicable chronic diseases (N=120)	
SAH	40 (33,3)
Diabetes	18 (15,0)
Dyslipidemia	15 (12,5)
Depression	15 (12,5)
Hypothyroidism	8 (6,7)
Osteoporosis	7 (5,8)
Others**	17 (14,2)

*N=49; ** Other chronic diseases: anxiety, obesity, glaucoma, asthma, and heart failure.

Table 2. Agreement of medication therapy adherence as indirectly measured by the BMQ and IAAFRT questionnaires in older adult patients of the Elderly Care Center (NAPI). (N=49). Rio de Janeiro, RJ, 2022.

		IAAFRT		
		Non-adherence	Adherence	Total
BMQ	Non-adherence	15 (30,6%)	17 (34,7%)	32 (65,3%)
	Adherence	8 (16,3%)	9 (18,4%)	17 (34,7%)
Total		23 (46,9%)	26 (53,1%)	49 (100%)

Kappa = -0.002; BMQ: Brief Medication Questionnaire; IAAFTR: Instrument for Assessing Attitudes Toward Medication Taking.

Regarding the level of understanding of prescribed medications among older adults, it was observed that 81.6% had a good understanding of the prescription. Prescriptions were classified according to complexity using the PCI tool. The average score for the complexity level of the prescription was 18.56, with a standard deviation of 5.48 points, indicating high complexity.

To assess the association between medication therapy adherence and understanding of the prescription, a comparison was made between adherence methods (BMQ and IAAFTR) and the level of prescription understanding. However, despite being anticipated, this relationship was not observed. Out of the 40 patients who had a good

level of information regarding the medications, only 16 (40%) exhibited medication therapy adherence according to the BMQ, and 19 (47.5%) according to the IAAFTR. However, it was not possible to observe a statistically significant difference, as presented in Table 3.

The complexity of pharmacotherapy was assessed concerning the two applied adherence methods and the results of the level of information regarding medications. Out of the 32 patients with complex prescriptions, 10 (31.2%) were adherent to medication therapy assessed by the BMQ and 18 (56.3%) by the IAAFTR. Nevertheless, 87.5% of these patients with complex therapy had a good level of information regarding medications (Table 4).

Table 3. Association between prescription understanding level and medication therapy adherence among older adult patients of the Elderly Care Center (NAPI). (N=49). Rio de Janeiro, RJ, 2022

		BMQ			IAAFTR		
		Non-adherence	Adherence	p-value	Non-adherence	Adherence	p-value
Level of information regarding medications	Good	24 (60%)	16 (40%)	0,136	21 (52,5%)	19 (47,5%)	0,145
	Poor	8 (89%)	1 (11%)		2 (22,2%)	7 (77,8%)	
Total		32 (65,3%)	17 (34,7%)		23 (46,9%)	26 (53,1%)	

P-value Fisher's Exact Test; BMQ: Brief Medication Questionnaire; IAAFTR: Instrument for Assessing Attitudes Toward Medication Taking.

Table 4. Association between Pharmacotherapy Complexity Index, Medication Therapy Adherence, and Medication Information Level Among Older Adult Patients of the Elderly Care Center (NAPI). (N=49). Rio de Janeiro, RJ, 2022.

	BMQ		IAAFTR		P-value	Level of information regarding medications			
	Non-adherence	Adherence	Non-adherence	Adherence		Good	Poor	P-value	
PCI	Complex	22 (68,8%)	10 (31,2%)	14 (43,7%)	18 (56,3%)	0,539	28 (87,5%)	4 (12,5%)	0,244
	Non-complex	10 (58,8%)	7 (41,2%)	9 (52,9%)	8 (47,1%)		12 (70,9%)	5 (29,4%)	
TOTAL		32 (65,3%)	17 (34,7%)	23 (46,9%)	26 (53,1%)		40 (81,6%)	9 (18,4%)	

P- value Fisher's Exact Test; BMQ: Brief Medication Questionnaire; IAAFTR: Instrument for Assessing Attitude Towards Medication Taking; PCI: Pharmacotherapy Complexity Index.

DISCUSSION

The present study suggests that older adults exhibited a good understanding of medication therapy, even though the majority did not adhere to the therapy and had complex prescriptions. This result was similar to the study conducted in Paraná¹⁶, which also assessed the behavior of polymedicated older adults regarding their medications.

More than half of the interviewees lived alone, had income below the minimum wage, and were predominantly female. A study conducted in an association of retired older adults¹⁷ also demonstrated a prevalence of female individuals, approximately 70%, indicating that older women seek medical assistance services and are more concerned about health than men¹⁸.

According to the Brazilian Guideline for Arterial Hypertension, systemic arterial hypertension is the most prevalent disease among older adults¹⁹. The predominance of this chronic condition may increase with advancing age, and when left untreated, it can lead to heart diseases such as heart failure and myocardial infarctions. Moreover, many hypertensive older adults are polymedicated and face difficulties in adhering to medication therapy²⁰.

Upon analyzing patient adherence to medication therapy using the BMQ, it can be observed that the primary cause of non-adherence was within the "Regimen" domain, where patients reported difficulties in listing prescribed medications, omitting

doses, or even taking extra doses without medical recommendation. This corroborates with a study conducted with older adults in the United States²¹, where 74.6% of participants reported not knowing the names of their medications, and some admitted to having difficulties in managing their medications. Therefore, it is crucial to employ strategies for the proper management and administration of medications to enhance adherence.

In the "Recall" domain, non-adherence was reported due to the difficulty of using multiple daily doses by patients, which can directly impact the high complexity of the prescription, as observed in the present study. The complexity of medication therapy is related to the number of comorbidities that the patient presents. The majority of patients in the study were hypertensive, and it is known that hypertensive older adults seldom achieve blood pressure control with monotherapy¹⁹.

Low adherence to medication therapy severely compromises patients' treatment outcomes. Thus, adherence to medication therapy is essential for achieving positive clinical outcomes and ensuring health improvement. However, there is a lack of studies on how older adults' opinions and daily medication management influence medication adherence²².

In the present study, slightly more than half of the older adults did not adhere to medication therapy based on the methods used. A study conducted with older adults receiving outpatient²¹ care obtained

a non-adherence rate of 40.9%, although the sample size was larger. However, a similar result to the present study was found, with 44.9% of the interviewees adhering to therapy, and they utilized the same assessment tool, the IAAFTR²³.

This study reinforces other research suggesting that non-adherence can be intentional or unintentional. Unintentional non-adherence is caused by forgetfulness, misunderstanding of how or when to use medications, and this type of non-adherence can be prevented through strategies in the patient's daily routine^{24,25}.

When comparing the questionnaires measuring medication therapy adherence (BMQ and IAAFTR), no statistically significant association was observed between them. So far, there have been no studies in the literature that have compared questionnaires assessing medication therapy adherence.

Although both questionnaires have the same objective, it is observed that the points evaluated by them are different. It is valid to emphasize that the medication therapy adherence process is multifactorial, involving behavioral aspects, beliefs, understanding of overall health status, comprehension of how to incorporate medications into daily routines, among other factors.

The study conducted by Cross et al.²⁶ demonstrates that there are various tools to assess medication therapy adherence in older adults and different strategies to encourage correct medication use (behavioral and educational interventions). However, there is heterogeneity of methods and methodological limitations in the literature, which corroborates the multifactorial nature of the adherence process.

Therefore, even though there are various tools available to indirectly assess adherence, it is up to the healthcare professional to have sensitivity to view the patient holistically. Thus, patient care by a multidisciplinary team is of utmost importance. Each professional will have a specific perspective based on their area of expertise, and thus the collected information will be complementary, allowing for an expansion of patient care, especially for older adults who, for the most part, present multiple comorbidities associated with polypharmacy.

Although patients could consult their medical prescription to answer the questionnaire "Level of Information Regarding Prescribed Medications," many were unable to identify the dose and frequency of administration of the medications they routinely used. A study conducted in Brazil, using the same tool but with adults using one or more medications, demonstrated that the studied population had a good level of information regarding their medications. However, this sample was very different from the present study, as it focused on polymedicated older adults, and the use of multiple medications is a complicating factor for understanding therapy¹².

When associating the questionnaires regarding understanding level and adherence measure, it was observed that patients who did not adhere had a good understanding of the prescription, which is a controversial result. In a Systematic Review on Self-Reported Health Literacy and Adherence, it was shown that there is a positive association between health literacy and adherence to pharmacotherapy³. When dealing with older patients, the ideal is for the therapeutic regimen to be as simple as possible. Another important point is to establish good communication and health education by the professionals involved in care, so that polymedicated older adults can achieve a better understanding of medication therapy²⁷.

Complex prescriptions with multiple medications lead to medication errors and increase the risks of drug interactions and adverse events. Therefore, it was expected that patients with more complex prescriptions would mostly be non-adherent to medication therapy. However, it was not possible to reach this conclusion when statistically comparing the two applied tools.

It is worth noting that no studies with similar comparisons to those conducted in this work were found. However, despite the existence of different questionnaires to assess medication therapy adherence, they all had the same ultimate goal. Thus, it can be said that the questionnaires (BMQ and IAAFTR) have different characteristics for measuring medication therapy adherence but complement each other according to the profile of the studied population.

When evaluating older patients, it is important to consider all aspects related to health and medication use. Thus, the relationship between professionals and patients should be conducted with a holistic view, so that therapeutic approaches can make lifestyle changes in an integrated manner and consequently improve pharmacotherapy^{29,30}.

The present study presents some limitations, which entail biases, such as the fact that the information collected from patients is self-reported, and may be influenced by memory bias, potentially leading to an overestimation of some data. Regarding measurement equivalence, the size of the studied population was one of the limitations encountered, a factor associated with the decrease in outpatient visits due to the Covid-19 pandemic.

CONCLUSION

Based on the data collected in this study, it can be observed that assessing medication adherence is a significant challenge, as the majority of interviewed patients demonstrated a good level of knowledge about their medications, yet predominantly exhibited low adherence to medication therapy. Additionally, the two applied adherence methods yielded differing results. The presented results demonstrate the necessity for great caution when employing indirect methods of adherence assessment, as they are not interchangeable despite sharing the same objective. Measures of factors influencing adherence, such as the complexity of

medication therapy and the level of patient information regarding their prescription, although seemingly impacting adherence, did not exhibit such correlation with the use of the tools, i.e., when these points were quantified. Therefore, it is believed that a holistic view of the polymedicated older adult is essential to achieve satisfactory outcomes in medication therapy. Further studies like this one should be conducted to arrive at the best approach for assessing medication adherence in polymedicated older adults, aiming to improve the success of medication therapy.

AUTHORSHIP

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REFERENCES

1. Plácido AI, Herdeiro MT, Simões JL, Amaral O, Figueiras A, Roque F. Health professionals perception and beliefs about drug-related problems on polymedicated older adults- a focus group study. *BMC Geriatrics* [Internet] 2021 [Access January 11, 2022];21(1):27. Available at: <https://doi.org/10.1186/s12877-020-01972-3>
2. Dias BM, Santos FS dos, Reis AMM. Potential drug interactions in drug therapy prescribed for older adults at hospital discharge: cross-sectional study. *São Paulo Medical Journal*. [Internet] 2019 [Access January 11, 2022];137(4):369–78. Available at: <https://doi.org/10.1590/1516-3180.2019.013405072019>
3. Schönfeld MS, Pfisterer-Heise S, Bergelt C. Self-reported health literacy and medication adherence in older adults: a systematic review. *BMJ Open*. [Internet] 2021 [Access February 11, 2024];11(12):e056307. Available at: <https://doi.org/10.1136/bmjopen-2021-056307>
4. Dal-Fabbro AL. Adherence to long term therapies: evidence for action. *Caderno Saúde Pública*. [Internet] 2005 [Access January 11, 2022]; 21(4):1297–8. Available at: <https://doi.org/10.1590/S0102-311X2005000400037>

5. Drummond ED, Simões TC, Andrade FB de. Avaliação da não adesão à farmacoterapia de doenças crônicas e desigualdades socioeconômicas no Brasil. *Revista Brasileira de Epidemiologia*. [Internet] 2020 [Access February 16, 2021];23. Available at: <https://doi.org/10.1590/1980-549720200080>
6. Gama RS, Passos LCS, Amorim WW, Souza RM, Queiroga HM, Macedo JC, Nunes LGO, Oliveira MG. Older people's knowledge of the purpose of drugs prescribed at primary care appointments. *Revista da Associação Médica Brasileira*. [Internet] 2021 [Access March 9, 2022];67(11):1586–94. Available at: <https://doi.org/10.1590/1806-9282.20210646>
7. González-Bueno J, Sevilla-Sánchez D, Puigoriol-Juventeny E, Molist-Brunet N, Codina-Jané C, Espauella-Panicot J. Improving medication adherence and effective prescribing through a patient-centered prescription model in patients with multimorbidity. *European Journal of Clinical Pharmacology*. [Internet] 2022 [Access March 13, 2023];78(1):127–37. Available at: <https://doi.org/10.3390/ijerph18189606>
8. Pacheco MP, Fortes FML, Santos RR dos, Silva GOS. Researching Interventions to Improve Medication Adherence in Ulcerative Colitis Patients. *Journal of Coloproctology*. [Internet] 2021 [Access March 9, 2022];41(01):096–103. Available at: <https://doi.org/10.1055/s-0041-1724053>
9. Gautério-Abreu DP, Santos SSC, Silva BT da, Gomes GC, Cruz VD, Tier CG. Prevalência de adesão à terapêutica medicamentosa em idosos e fatores relacionados. *Revista Brasileira de Enfermagem*. [Internet] 2016 [Access February 16, 2021];69(2):335–42. Available at: <https://doi.org/10.1590/0034-7167.2016690217i>
10. Ben AJ, Neumann CR, Mengue SS. Teste de Morisky-Green e Brief Medication Questionnaire para avaliar adesão a medicamentos. *Revista de Saúde Pública*. [Internet] 2012 [Access February 16, 2021];46(2):279–89. Available at: <https://doi.org/10.1590/S0034-8910201200500001311>
11. Strelec MAAM, Pierin AMG, Mion Júnior DA. The influence of knowledge about the disease and the attitude towards taking medication to control arterial hypertension. *Arquivos Brasileiros de Cardiologia*. [Internet] 2003 [Access February 22, 2024];81(4):343–8. Available at: <https://doi.org/10.1590/S0066-782X2003001200002>
12. Silva T da, Schenkel EP, Mengue SS. Nível de informação a respeito de medicamentos prescritos a pacientes ambulatoriais de hospital universitário. *Caderno de Saúde Pública*. [Internet] 2000 [Access February 16, 2021];16(2):449–55. Available at: <https://doi.org/10.1590/S0102-311X2000000200015>
13. George J, Phun YT, Bailey MJ, Kong DC, Stewart K. Development and Validation of the Medication Regimen Complexity Index. *Annals of Pharmacotherapy*. [Internet] 2004 [Access February 16, 2021];38(9):1369–76. Available at: <https://doi.org/10.1345/aph.1D479>
14. Melchior AC, Correr CJ, Fernández-Llimos F. Tradução e validação para o português do Medication Regimen Complexity Index. *Arquivo Brasileiro de Cardiologia*. [Internet] 2007 [Access February 16, 2021];89(4):210–18. Available at: <https://doi.org/10.1590/S0066-782X2007001600001>
15. Pantuzza LL, Ceccato M das GB, Silveira MR, Pinto IV, Reis AMM. Validation and standardization of the Brazilian version of the Medication Regimen Complexity Index for older adults in primary care. *Geriatrics & Gerontology Int*. [Internet] 2018 [Access February 22, 2024];18(6):853–9. Available at: <https://doi.org/10.1111/ggi.13261>
16. Schonrock GLF, Costa L, Bender S, Linartevichi VF. Adesão ao tratamento medicamentoso de pacientes idosos hipertensos em uma unidade de saúde da família em Cascavel Paraná. *FAG Journal Of Health (FJH)*. [Internet] 2021 [Access March 9, 2022];3(1):29–33. Available at: <https://doi.org/10.35984/fjh.v3i1.298>
17. Barella LV, Kowalski L, Alves IA, Andrade VRM, Pagno AR, Oliveira TB de. Uso de medicamentos potencialmente inapropriados para pessoas idosas em uma associação de aposentados. *Revista Brasileira de Geriatria e Gerontologia*. [Internet] 2020 [Access March 9, 2022];23(4). Available at: <https://doi.org/10.1590/1981-22562020023.200165>
18. Valer G, Kauffmann C, Rigo MPM, Martines LSE. Avaliação farmacológica de medicamentos usados por idosos frequentadores de uma drogaria privada. *Pan-American Journal of Aging Research - PAJAR*. [Internet] 2020 [Access March 13, 2023];8(1):e36528. Available at: <https://doi.org/10.15448/2357-9641.2020.1.36528>
19. Barroso WKS, Rodrigues CIS, Bortolotto LA, Mota-Gomes MA, Brandão AA, Feitosa AD de M, et al. Diretrizes Brasileiras de Hipertensão Arterial. *Arquivo Brasileiro de Cardiologia*. [Internet] 2021 [Access March 13, 2023];116(3):516–658. Available at: <https://doi.org/10.36660/abc.20201238>
20. Da Trindade EO, De Melo Souto RÁD, Alves GA de C, Magalhães HIF. Avaliação da adesão ao tratamento medicamentoso de pacientes idosos atendidos em um Ambulatório de Geriatria. *Revista de Ciências da Saúde - VITTALLE*. [Internet] 2020 [Access March 13, 2023];32(3):35–44. Available at: <https://doi.org/10.14295/vittalle.v32i3.11089>

21. Brooks TL, Leventhal H, Wolf MS, O’Conor R, Morillo J, Martynenko M, et al. Strategies Used by Older Adults with Asthma for Adherence to Inhaled Corticosteroids. *Journal of General Internal Medicine*. [Internet] 2014; [Access March 9, 2022];29(11):1506–12. Available at: <https://doi.org/10.1007/s11606-014-2940-8>
22. Martin L, Feig C, Maksoudian CR, Wysong K, Faasse K. A perspective on nonadherence to drug therapy: psychological barriers and strategies to overcome nonadherence. *Patient Preference and Adherence*. [Internet] 2018 [Access March 9, 2022]; 12:1527–35. Available at: <https://doi.org/10.2147/PPA.S155971>
23. Daniel ACQG, Veiga EV. Fatores que interferem na adesão terapêutica medicamentosa em hipertensos. *Journal Einstein (São Paulo)*. [Internet] 2013 [Access February 22, 2024];11(3):331–7. Available at: <https://doi.org/10.1590/S1679-45082013000300012>
24. Gomes D, Placido AI, Mór R, Simões JL, Amaral O, Fernandes I, et al. Daily Medication Management and Adherence in the Polymedicated Elderly: A Cross-Sectional Study in Portugal. *International Journal of Environmental Research and Public Health*. [Internet] 2019 [Access March 9, 2022];17(1):200. Available at: <https://doi.org/10.3390/ijerph17010200>
25. Oliboni LS, Castro MS de. Adesão À Farmacoterapia, Que Universo É Esse? Uma Revisão Narrativa. *Clinical & Biomedical Research*. [Internet] 2018 [Access March 9, 2022];38(2):178–95. Available at: <https://doi.org/10.4322/2357-9730.80552>
26. Cross AJ, Elliott RA, Petrie K, Kuruvilla L, George J. Interventions for improving medication-taking ability and adherence in older adults prescribed multiple medications. *Cochrane Database of Systematic Reviews*. [Internet] 2020 [Access February 22, 2024];(5). Available at: <https://doi.org/10.1002/14651858.CD012419.pub2>
27. Moretti MCMS, Ruy ABAB, Saccomann ICR. A compreensão da terapêutica medicamentosa em idosos em uma unidade de saúde da família. *Revista da Faculdade de Ciências Médicas de Sorocaba*. [Internet] 2018 [Access March 9, 2022];20(1):7. Available at: <https://doi.org/10.23925/1984-4840.2018v20i1a3>
28. Galato D, Simões IG, Soares LS da S. Avaliação do Índice de Complexidade da Farmacoterapia em Pacientes de um Ambulatório de Transplante Renal. *Brazilian Journal of Transplantation*. [Internet] 2022 [Access March 13, 2023];25(2). Available at: https://doi.org/10.53855/bjt.v25i2.448_pt
29. Medeiros KKAS, Pinto Júnior EP, Bousquat A, Medina MG. O desafio da integralidade no cuidado ao idoso, no âmbito da Atenção Primária à Saúde. *Saúde em Debate*. [Internet] 2017 [Access March 9, 2022];41(spe3):288–95. Available at: <https://doi.org/10.1590/0103-11042017s322>
30. Cordeiro De Morais J, Santos KF, Garrido De Andrade C, Pinto Costa IC, De Medeiros Brito F, Das Graças M, et al. Significado De Cuidado: O olhar de profissionais e idosos institucionalizados. *Revista de enfermagem - UFPE*. [Internet] 2015 [Access March 9, 2022]; 9(7): 8937-45. Available at: <https://doi.org/10.5205/reuol.8074-70954-1-SM0907supl201501>