Medication safety of older patients in the hospital setting: a scoping review

Abstract

Objective: To identify the scientific evidence available in the literature on medication safety for older adults in the hospital setting. Method: A scoping review was conducted on medication safety among older patients in the hospital setting involving searches of the LILACS, SCIELO, MEDLINE, and PUBMED databases. Health descriptors were used according to DECS: patient safety, elderly, medications, hospital. The study included complete articles available in full, in Portuguese, English or Spanish. Duplicate articles, theses and dissertations were excluded. Results: The search retrieved 172 publications. After reading of titles and abstracts, 8 articles that met the inclusion criteria were selected. The final sample of this scoping review comprised 8 selected studies, while the rest were excluded for being off-topic. The review allowed mapping of a significant number of publications on medication safety for hospitalized older adults. Conclusion: This review found proposed strategies for preventing medication errors in the hospital environment.

Keywords: Patient Safety. Nursing. Aged. Pharmacological Treatment. Hospital.

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INTRODUCTION

Aging is defined as a natural irreversible progressive process, common to all beings of a species, accompanied by biological, psychological and social changes of an individual. This process of physiological decline encompasses a group of functional and structural changes which can result in motor impairment or psychological and social difficulties, negatively impacting the health and disease process.1

This scenario of physiological decline is marked by a steady increase in the prevalence of chronic diseases and number of medications used, often culminating in multiple drugs use, or polypharmacy (concomitant use of ≥5 medications). Polypharmacy is common in hospitalized older adults and can lead to an increase in the occurrence of potential drug-drug interactions and Adverse Drug Reactions (ADRs), posing a risk to the safety of older patients in the administration of drugs.2

Frailty and the numerous chronic diseases found in the older population, concomitant with polypharmacy, renders the individual more vulnerable to adverse drug events (ADEs), such as drug-drug interactions, medication errors, falls risk, increased hospitalization rate, among other negative therapeutic aspects.3

Adverse events in the hospital setting occur in around 10% of hospitalized patients. However, studies show that this percentage can range from 5 to 41%. Moreover, investigations report that, of the different adverse events, medication error can occur in 3 to 54% of cases.4,5

Although studies on medication safety in older adults are available in the Brazilian literature, few of these specifically address this issue in hospitalized older patients. Therefore, the main contribution of the present study to the literature in the field is informing future professionals with a view to enhancing the safety of care in health services.6

Thus, the objective of the study was to explore the available scientific evidence on medication safety for older adults within the hospital setting with a view to defining integrative health and care strategies and promoting medication safety in this age group.

METHOD

A scoping review study was carried out in accordance with the method recommended by the Joanna Briggs Institute Reviewers’ Manual and technical framework proposed by Arksey and O’Malley. This type of study entails an exploratory reviewed aimed at mapping, based on the scientific output, publications relevant to a given area of study, and public registration on the Open Science Framework Platform (https://doi.org/10.17605/OSF.IO/RP3NB).

The scoping review involved the following stages: identifying the research question, inclusion criteria, research strategy, and extraction and reporting of results. The sixth optional stage (consultation) was not employed.

The research question was developed using the PCC strategy, with P: Population = hospitalized older adults; C: Concept = medication safety; and C: Context = Hospital environment, and the following guiding research question was devised: What is the available scientific evidence on medication safety for older adults in the hospital setting?

The articles retrieved were screened based on the eligibility criteria. The inclusion criteria were: original articles, published in Portuguese, Spanish or English on medication safety, whose research subjects included hospitalized older adults, published between 2018 and 2023. Duplicate studies, reviews, editorials, theses, dissertations, experience reports, theoretical trials, reflection studies and books were excluded.

One of the data sources searched was the Biblioteca Virtual em Saúde which included the following databases: Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS), International Literature on Health Science (MEDLINE), Índice Bibliográfico Espanhol de Ciências da Saúde (IBECS), Base de Dados de Enfermagem (BDENF) and Cumulative Index to
The following controlled term descriptors suggested by the Medical Subject Headings (MeSH) and the Descriptores em Ciências da Saúde (DeCS) were selected: Patient safety, Aged, Pharmaceutical preparations and Hospitals. All of these terms were search in their equivalent forms in Spanish and Portuguese. The search strategy was tailored according to the definition of each corresponding database. The Boolean operator AND was employed with the following combinations: Patient Safety AND Aged AND Pharmaceutical preparation AND Hospitals; Patient Safety AND Aged AND Pharmaceutical preparation; Patient Safety AND Pharmaceutical preparation. All of these search strategies were applied in their equivalent forms in English, Spanish and Portuguese in April 2023.

The PRISMA Extension for Scoping Reviews (PRISMA ScR) methodology was used to systematize the study inclusion process. A total of 121 studies were retrieved from the data sources selected. After removal of paid material and exclusion based on initial reading of titles and abstracts, as well as removal of duplicates, 8 studies remained for inclusion in the review.

A reference management tool was employed to help organize the material and carry out study selection. The 121 articles selected were screened for title and abstract by 2 independent examiners to include, exclude or select the “doubt” field through blinding of reviewers and automatic identification of duplicity. Disagreements were discussed and resolved by consensus, where a minimum agreement of 75% between reviewers was established. The doubts existing and conflicts were resolved by consensus in May after blinding of reviewers was lifted. Following selection, the studies were analyzed by full reading.

Studies that failed to meet the selection criteria, lacked data pertinent to the study objective, or did not address the elected concept or context were excluded.

Polypharmacy was defined as the use of 5 different medications or more, a common phenomenon among older adults. This situation poses a challenge in health services and care provision owing to the series of complications which can arise due to prescription of inappropriate medications, harmful drug-drug interactions, increased risk and severity of adverse reactions, cumulative toxicity, iatrogenic issues, poor adherence to treatment, besides the occurrence of hospitalizations and deaths.

The concept of Adverse Drug Events (ADEs) can be defined as harm experienced by a patient as a result of exposure to a medication, with some cases resulting in death. Improving medication safety of hospitalized older adults requires a fitting approach to manage the balance between efficacy and safety in the prescribing and use of medications. In addition, close monitoring of signs, symptoms and laboratory parameters to detect and assess the occurrence and severity of possible adverse events is also necessary in order to offer proper treatment.

The process of identification, screening, eligibility and inclusion of studies for selection of the sample is shown in Figure 1. No back search based on the list of references of the selected studies was carried out and, thus, no additional articles were included.

DATA AVAILABILITY

The complete dataset underpinning the results of the present study are available on Figshare and can be accessed at https://doi.org/10.6084/m9.figshare.25790502.
RESULTS

In the present review, 121 studies were found on the different databases as follows: MEDLINE n=14 articles (11.57%), LILACS n=16 (13.22%), BDENF n=62 (51.23%), PUBMED n=33 (27.27%) and CAPES Periodicals n=47 (38.84%). The articles found had all been published and made available for study between 2018 and 2023. Of the total studies, 8 were selected for inclusion in the study sample. The settings of the respective studies ranged from long-term care facilities to hospitals. The studies were also conducted in various different States. The studies included in the review are outlined in Chart 1.

Of the initial 172 studies retrieved, 8 studies met the inclusion criteria after reading of titles and abstracts. The remaining studies were excluded for being off-topic.
Overall, the results showed that participants of the studies were predominantly males, aged 65-75 years, and sought hospital level care for treatment of acute and chronic diseases. The results also revealed that the populations studied held medical prescriptions for use of Potentially Inappropriate Medications (PIMs)\(^1\)\(^2\)\(^3\)\(^4\)\(^5\)\(^6\)\(^7\)\(^8\)\(^9\)\(^10\)\(^11\)\(^12\)\(^13\)\(^14\)\(^15\)\(^16\).

With regard to publication language, six\(^11\)\(^14\)\(^17\)\(^18\) (75%) articles were in Portuguese and two\(^13\)\(^16\) (25%) in English. In terms of study design, four\(^13\)\(^15\)\(^19\) were cross-sectional (50%), one\(^11\) ecological (12.5%), one\(^16\) observational (12.5%), one\(^15\) randomized (12.5%) and one\(^7\) was a review study (12.5%). For country of study, most of the investigations took place in Brazil, accounting for six\(^11\)\(^14\)\(^17\)\(^18\) articles (75%), plus one\(^16\) in Holland (12.5%) and one\(^15\) in North America (USA)(12.5%). Lastly, concerning the level of care provided by nurses, all eight\(^11\)\(^18\) studies involved in-hospital care (100%).
DISCUSSION

Health teams, particularly nurses, face significant challenges dealing with the management of drug therapies in hospitalized geriatric patients, due to the particularities of the pharmacodynamic and pharmacokinetics in this age group. Furthermore, given the dearth of specific studies on medications in older adults, health teams must take actions to ensure a drug-therapy approach based on effectiveness, safety and need, taking into account the individual clinical context of the patient 12,14.

Some of the studies reviewed reported incidents associated with drug-drug interactions as one of the factors compromising medication safety of the hospitalized older adults assessed. Drug-drug interactions occur when combinations of medications are used for different indications or treatments and can result in unintentional consequences with changes in pharmacokinetics and pharmacodynamic, resulting in a reduction in effectiveness or increase in toxicity of the drug. These reactions are considered preventable Adverse Drug Events (ADEs) that may result in serious or fatal outcomes and compromise the safety of patients in hospitals, occurring prior to admission or as an event resulting from hospitalization 3-12.

These reactions can be classified according to severity: 1) Severe: life-threatening and requiring immediate intervention; 2) Moderate: when the clinical condition of the patients worsens and there is a need to change the drug therapy; 3) Mild: when the patient present shifts in their clinical condition, but not requiring changes in drug therapy; and 4) Contraindicated: when co-administration with other drugs is not recommended 41.

With regard to use of PIMs for older adults, it is in this patient group that the risks of adverse events associated with their use can outweigh the therapeutic benefits, particularly when more effective alternatives are available. This highlights the importance of close control of the drug therapy with the proper medical prescription, so as to prevent drug interactions and intoxications, which tend to involve the gastrointestinal system of these individuals 43-45.

A retrospective study reported that around half of adverse drug events required a higher level of care, of which 74% had the potential to cause temporary or permanent harm and 84% were preventable. The main drug classes involved in these events were antibiotics and antithrombotic agents 39.

A host of risk factors can contribute to the occurrence of undesirable drug interactions, classified as factors related to patients, to medications and to medical prescriptions. Patient-related risk factors include age, comorbidity and polypharmacy. Risks associated with medications include enzyme inhibition or induction potential, and therapeutic margin and dose. Medical prescription-associated risks include high number of drugs prescribed, complexity of the clinical condition and prescriptions administered within and outside the hospital environment 12.

Annually, an estimated 2.6 million deaths occur due to ADEs associated with healthcare in hospitals worldwide. Adverse events constitute one of the leading causes of death and disability in patients, constituting incidents which cause patients harm, especially hospitalized older adults 16.

A cross-sectional study involving medication-related problems/errors as reported to the Dutch medication incident registry, found that these cases are commonly related to confusing product characteristics, packaging issues such as the lack of a single unit package for an oncolytic product, or incorrect or incomplete user instructions 16.

These findings underscore the importance of patient safety policies, such as the National Program for Patient Safety (PNSP), established in 2013 by the Brazilian Health Ministry, aimed at addressing the group of healthcare areas with quality and patient safety issues, including those related to medications. The program is intrinsically associated with care quality and has garnered international recognition, providing a valuable service for patients, families, managers and health professionals with the aim of safer care 11.

In a Dutch study, Karapinar-Çarkit et al. 16 found that the care practice of professionals involved in providing care to hospitalized older adults was unpinned by valorization, conciliation of medications and advising patients on the safety of medications. Thus, at hospital discharge, the
Medication safety of hospitalized older patients


medication regimen is discussed with patients and information tailored to their needs.

Enhancing the quality of medication use and safety are priorities for prescribers working with older adults. As with all potential drug interactions identified in the present study, the importance of the role of nursing professionals is clear, as being best placed to contribute to the safety and effectiveness of drug therapy, critically assessing prescriptions and proactively identifying possible drug interactions. In addition, this prevents the occurrence of adverse events together with the multidisciplinary team21.

Based on the analyses of the publications, the results show that, in order to tackle the problems and challenges related to the safety of medications, as well as the high mortality rates, nursing professionals should seek to constantly improve their technical and scientific knowledge on patient safety.

These professionals should also establish knowledge and correct procedure in care provision as ethical principles, particularly with respect to the administering of medications11-18.

CONCLUSION

The mapping of scientific output has provided an overview of a variety of different studies whose aim was to implement actions targeting medication safety of hospitalized older adults. The present review identified strategies for preventing medication errors in the hospital setting. Strategies should be devised to attend older adults swiftly and safely, given that the implementation of these measures in the hospital routine can reduce complications, such as adverse events, drug interactions and prolonged hospital stays.

Future studies to further discussions on medication safety of older adults in the hospital context are warranted. This subject should be further studied and preventive measures adopted for monitoring the use of medications.

Taken together, these results reaffirm the need for professionals to be informed and prepared with respect to “care aimed at medication safety”, in response to the growing incidence of drug interactions, ADEs and deaths associated with these errors, and that holding knowledge on patient safety is fundamental for resolutive quality health care.

AUTHORSHIP

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- Mariana Albernaz Pinheiro de Carvalho - Approval of the version to be published and responsible for all aspects of the work, ensuring that issues related to the accuracy or integrity of any part of the work are resolved.

REFERENCES


