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Assessment tool for potentially inappropriate medication use in the elderly: a scoping review protocol

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ABSTRACT

Potentially Inappropriate Medication for the elderly (PIM) are drugs in which the safety risks may exceed the benefits, especially when there are safer alternatives. The use of PIM is associated with increased hospitalizations and it is estimated that one every five prescriptions presents at least one PIM. In this context, there are several assessment tools for identification of PIM. The first assessment tool developed was Beers criteria and since its publication, new tools have been developed. The objective of this scoping review is to explore studies presenting assessment tools of PIM to map characteristics, justifications, and therapeutic equivalents. This review will consider studies that developed or validated an assessment tool of PIM. Electronic searches will be performed in PubMed and Scopus with no time limit. Two researchers, independently, will select registries and extract data of studies and tool characteristics, PIM and potentially inappropriate interaction, condition, justification, and therapeutic equivalents. The findings will be presented in narrative form including tables and figures to aid in data presentation, where appropriate.

Keywords: Aged. Potentially Inappropriate Medication List. Inappropriate Prescribing. Deprescriptions.

INTRODUCTION

The risks of hospitalization due to adverse drug events (ADE) are more frequent in the elderly when compared to the general population (Salvi et al., 2012). It is estimated that ADE is the cause of hospitalization of at least one in two older adult (Varallo et al., 2014).

In the aging context, important physiological changes, especially at the cognitive, hepatic and renal levels occur, (Aalami et al., 2003) modifying the pharmacokinetics and pharmacodynamics of the drugs (Schwartz, 2007). In addition to the aging changes, the multimorbidity (Salive, 2013) and polypharmacy (Wehling, 2009) are frequent among the elderly, favoring the prescription of potentially inappropriate medication (PIM) (Shade et al., 2017), the occurrence of potentially inappropriate interactions (i.e. drug-drug or drug-syndrome/ disease) and increasing the incidence of ADE (Varallo et al., 2013).

PIM are those drugs where the risks of ADE can outweigh the benefits, especially when there are other safer and more effective options (Gallagher & O'Mahony 2008). Moreover, PIM are also associated with increased risk of hospitalization (Albert et al., 2010) and mortality (Muhlack et al., 2017).

Considering patient safety, an interesting way to assess the risk/benefit of drug therapy is the use of tools for assessment inappropriate medications to identify the use of PIM. These tools can reduce the use of PIM (Dalleur et al., 2014) and the incidence of falls and costs (Frankenthal et al., 2014), preventing up to 44% of the incidence of ADE (Wang-Hansen, 2019). Furthermore, they are considered important educational tools, (Motter et al., 2018) promoting prescription optimization and drug safety. The Beers criterion was the first tool developed (Beers et al., 1991) and is widespread in clinical practice. Since its publication, new tools are being developed to attend the needs of each country, according to marketed drugs (Holt et al., 2010; O'mahony et al., 2015; Renom-Guiteras et al., 2015).

A preliminary search of PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews and the JBI Evidence Synthesis was conducted and revealed that there is no scoping review regarding our propose. In 2018, Motter *et al*., (Motter et al., 2018) through a systematic review, detected 36 tools, but did not describe the reasons and conditions that justified the medications as PIM and did

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not describe therapeutic equivalents. This review provided a relevant summary and discussion about PIM, but in view of the constant development and publication of new tools to fill the gaps in the different drugs marketed in each country, new tools have already been published since the systematic review of Motter *et al*. that justify an update with a new approach, also focusing on therapeutic reasons and therapeutic equivalents.

Thus, we aim to conduct a scoping review to explore existing literature related to characteristics, justifications, and therapeutic equivalents of assessment tool of PIM.

REVIEW QUESTIONS

Two main questions will be addressed in this review:

i) What are the tools developed to assess inappropriate prescribing in the elderly?

ii) What are the potentially inappropriate medications (PIM), the potentially inappropriate interactions (PII), the reasons and the therapeutic equivalents?

METHODS

The proposed systematic review will be conducted in accordance with the Cochrane Collaboration (Higgins et al., 2019) and Joanna Briggs Institute methodology for scoping reviews (Peters et al., 2015).

Inclusion criteria

Participants: This review will consider studies that present or validate medication assessment tools in the elderly, both over 60 or 65 years of age, regardless gender and clinical conditions;

Concept: This review will consider studies that present or validate medication assessment tools to identify PIM or PII (i.e. drug-drug or drug-syndrome/disease), and respective reasons and therapeutic equivalents. Tools that only consider implicit criteria, appropriate medications, and PIM, PII or therapeutic equivalents that comprise drugs not-market worldwide will be excluded;

Context: There will be no restriction for the country or health care settings for which the tool was proposed;

Types of studies: Any potential study to present or validate PIM assessment tool will be considered, such as clinical trials, observational studies, review and expert panel studies. Will be excluded editorials, letters, news, abstracts of congress proceedings, thesis, and dissertation publication, as well studies published in non-roman alphabet languages (e.g. Arabic, Chinese, Russian). Studies published from database inception to the present will be included. The searches will be re-run before writing of the manuscript.

Search strategy

The search strategy will aim to locate published studies. An initial limited search of PubMed was undertaken to identify articles on the topic. The text words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles were used to develop a full search strategy for Scopus and PubMed, which includes MEDLINE and PubMed Central databases (see Appendix I). The search strategy, including all identified keywords and index terms, will be adapted for each included information source. The reference list of all studies selected for critical appraisal, as well as systematic reviews recovered in the search, will be screened to identify any additional papers.

Study selection

Following the search, all identified records will be collated and uploaded into EndNote X7.2.1 (Clarivate Analytics, PA, USA) and duplicates will be removed. Titles and abstracts will then be exported to sheets of Microsoft Excel and screened by two independent reviewers against the inclusion criteria for the review. Potentially relevant papers will be retrieved in full. The full text of selected citations will be assessed in detail against the inclusion criteria by two independent reviewers. Reasons for exclusion of full text studies that do not meet the inclusion criteria will be recorded and reported in the scoping review. Any disagreements that arise between the reviewers at each stage of the study selection process will be resolved through discussion, or with a third reviewer. The results of the search will be reported in full in the final systematic review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow diagram (Moher et al., 2009).

Data extraction

Data will be extracted from studies included in the review by two independent reviewers using a data extraction tool developed by the reviewers in Microsoft Excel (Redmond, Washington, USA). The extracted data will include specific details about: i) study characteristics (i.e. author names, year of publication, name of the proposed tool, study design, country, setting, professionals, funding), ii) PIM (i.e drug or pharmacological class), PII (i.e. drug-drug or drug-syndrome/disease), reasons, and therapeutic equivalents, when available.

A draft extraction tool is provided in Appendix II. The draft data extraction tool will be modified and revised as necessary during the process of extracting data from each included paper. Modifications will be detailed in the full scoping review. Any disagreements that arise between the reviewers will be resolved through discussion or by a third reviewer.

Data presentation

The extracted data will be presented in graphical or tabular form. Figures, tables and charts will be used, where appropriate. The tables and charts will report: i) characteristics of studies, ii) distribution of tools by year, and country; iii) PIM, PII, reasons,

and therapeutic equivalents, considering the classification of essential medicines by World Health Organization (2017). A narrative summary will accompany the tabulated or charted results. It will describe how the results relate to the objectives and questions of the review.

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RESUMO

Ferramenta de avaliação do uso potencialmente inapropriado de medicamentos em idosos: um protocolo de revisão de escopo

Medicamentos potencialmente inapropriados (MPI) para idosos são medicamentos nos quais os riscos à segurança podem exceder os benefícios, especialmente quando existem alternativas mais seguras. O uso de MPI está associado ao aumento de hospitalizações e estima-se que uma a cada cinco prescrições apresente pelo menos um MPI. Nesse contexto, existem várias ferramentas de avaliação e identificação de MPI. A primeira ferramenta de avaliação desenvolvida foi o critério de Beers e, desde a sua publicação, novas ferramentas foram desenvolvidas. O objetivo dessa revisão de escopo é explorar estudos que apresentem ferramentas de avaliação de MPI para mapear segundo as características, justificativas e equivalentes terapêuticos. Esta revisão considerará estudos que desenvolveram ou validaram ferramentas de avaliação do MPI. As pesquisas eletrônicas serão realizadas no PubMed e Scopus sem limite de tempo. Dois pesquisadores, de maneira independente, selecionarão registros e extrairão dados sobre as características do estudo e da ferramenta, MPI e interações potencialmente inapropriadas, justificativa e equivalentes terapêuticos. Os resultados serão apresentados em forma narrativa, incluindo tabelas e figuras para auxiliar na apresentação dos dados, quando apropriado.

Palavras-chave: Idoso. Lista de Medicamentos Potencialmente Inapropriados. Prescrição Inadequada. Deprescrições.

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APPENDIX I: SEARCH STRATEGY

PubMed (MEDLINE and PubMed Central)

#1: elderly[TIAB] OR aged[MH] OR aged[TIAB] OR "older adults"[TIAB] OR "older adult"[TIAB] OR "older people"[TIAB] OR geriatric[TIAB]

#2: (((inappropriate[TIAB] OR appropriateness[TIAB]) AND (medication*[TIAB] OR prescri*[TIAB])) OR "inappropriate prescribing"[MH] OR "Potentially Inappropriate Medication List"[MH] OR Deprescriptions[MH] OR deprescription*[TIAB] OR "PIM"[TIAB])

#3: (tool[TIAB] OR criteria[TIAB] OR list[TIAB] OR consensus[TIAB] OR consensus[MH])

#4: (news[PT] or letter[PT] OR editorial[PT] OR historical article[PT])

Search: #1 AND #2 AND #3 NOT #4

SCOPUS

#1: TITLE-ABS-KEY(elderly OR aged OR aged OR "older adult" OR "older adults" OR "older people" OR geriatric)

#2: TITLE-ABS-KEY(((inappropriate OR appropriateness) AND (medication* OR prescri*)) OR "inappropriate prescribing" OR "Potentially Inappropriate Medication List" OR deprescription* OR PIM)

#3: TITLE-ABS-KEY(tool OR criteria OR list OR consensus)

#4: DOCTYPE (bk OR ch OR cr OR ed OR le)

#5: (INDEX(medline))

Search: #1 AND #2 AND #3 AND NOT #4 AND NOT #5

APPENDIX II: DATA EXTRACTION INSTRUMENT

Sheets in Microsoft Excel with the following columns:

- Study code
- Surname of first author
- Year
- Name of tool
- Country
- Study design
- Setting
- Professional
- Funding
- Potentially inappropriate medications (i.e. drug or class)
- Potentially inappropriate interactions (i.e. drug-drug or drug-syndrome/ disease)
- Reasons
- Therapeutic equivalents