







BMJ Open Multifaceted pharmacist-led interventions in secondary care settings between countries of various income levels: a scoping review protocol

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ABSTRACT

Introduction Clinical pharmacy services often involve multifaceted pharmacist-led interventions. However, current pharmacy practice models vary across different countries. Despite the documented benefits of clinical pharmacy services, the characteristics of pharmacist-led interventions in different countries have not yet been adequately explored and described. Therefore, this protocol outlines the methodology for a proposed scoping review aiming to investigate various types of multifaceted pharmacist-led interventions and the outcomes used to evaluate their effectiveness within secondary care settings. Additionally, the scoping review will map the current evidence surrounding the characteristics of interventions and outcomes reported across various countries of socioeconomic status.

Methods and analysis The scoping review will be conducted according to the JBI Methodology for Scoping Reviews and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) Extension for Scoping Reviews. We will systematically search the following electronic databases: MEDLINE (Ovid), CINAHL (EbscoHost), Embase (embase.com), Scopus (scopus.com), Cochrane Library (cochranelibrary.com) and APA PsycInfo (Ovid). Additionally, the reference lists of identified reviews and included full texts will be searched for relevant papers. Grey literature sources, such as International Pharmaceutical Abstracts and the International Pharmaceutical Federation (FIP) website, will be searched. We will include primary studies published in the English language from January 2013 to December 2023, involving secondary care multifaceted pharmacist-led interventions. Two independent reviewers will screen studies against eligibility criteria and use a piloted data extraction form to extract relevant information. We will extract relevant data, complete a tabular summary from each included publication and analyse it.

Ethics and dissemination Ethical approval is not required as we will be using data from publicly available literature sources. Findings will be disseminated in publications and presentations with relevant stakeholders. We aim to map available evidence across the breadth of studies that have reported multifaceted pharmacist-led interventions and their outcomes.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The scoping review is more suitable for its purpose than a systematic review or meta-analysis, as it will search, map, summarise and present multifaceted pharmacist-led interventions across different economies.
- ⇒ The scoping review will provide a comprehensive overview of hospital pharmacist interventions.
- ⇒ The broad inclusion criteria will likely result in heterogeneity in study interventions and outcomes.
- ⇒ Included studies will not be subjected to a formal quality assessment, as scoping reviews aim to present a comprehensive overview of all available evidence, irrespective of its quality.
- ⇒ Limiting the review to English language only may cause omission of findings from research reported in other languages.

INTRODUCTION

Rational use of medicine remains a major concern worldwide. The ‘Medication without Harm’ report by the World Health Organization (WHO) highlights medication errors as the primary cause of preventable harm in global healthcare, associated with both system and human factors.¹ Further stated, significant variations in harm between countries were observed, showing a twofold increase in lower-middle-income countries (LMICs) compared with high-income countries (HICs).¹ Krahenbuhl-Melcher *et al* found that the risk of medication errors increases with included insufficient pharmacological knowledge of health professionals, documentation errors in patient charts and inadequate pharmacy services.² In addressing this issue, clinical pharmacy services, designed to suit different hospital settings, have been developed, evaluated and implemented over the past few decades.^{3–8}

The American College of Clinical Pharmacy, the Society of Hospital Pharmacists of Australia and the European Society of Clinical Pharmacy have outlined standards for clinical pharmacy services.^{9–13} Clinical pharmacy services can be described as multifaceted activities delivered by pharmacists for patients to minimise the risks associated with the use of medicines and to optimise their health outcomes.^{9–13} Clinical pharmacists work as integrated members of multidisciplinary teams to provide activities such as medication history and review for appropriateness; providing information to patients, families and other healthcare professionals to facilitate medication adherence and handover; and monitoring, identifying and reporting adverse drug reactions.^{9–13} The nature of these clinical pharmacy services varies from one setting to another.^{14 15} Furthermore, clinical pharmacy services are very important in secondary care as patients accessing this level are often in crisis, acutely unwell and have multiple medication-related issues. Therefore, the opportunity for a pharmacy service to be beneficial is greater.^{16 17} Secondary care typically refers to the care provided by a medical specialist or other healthcare professionals in hospitals or clinics, extending to the ongoing care delivered within the community.¹⁸ Moreover, hospital clinical pharmacists play a vital role in ensuring the accuracy of medication lists during patient admissions and transitions of care.¹⁶

While clinical pharmacy services comprise multifaceted pharmacist-led activities, Skjøt-Arkil and colleagues stated in their 2018 review that most previous systematic reviews have focused on certain types of intervention components such as medication review, medication reconciliation or patient education and conversation about their medication.¹⁹ Therefore, they conducted a systematic review to evaluate the impact of multifaceted pharmacist-led interventions in hospital settings between 2006 and 2018. Their eligibility criteria for this review were inpatients with controlled studies and, as a result, identified articles only from upper-middle-income countries (UMICs) and HICs.¹⁹

A recent 2022 systematic review investigated pharmacist services in South Asian countries on randomised controlled trials both in hospital and community settings. This review revealed that variations observed in intervention types within these regions, primarily focusing on patient education and discussions.²⁰ Another review identified seven different categories of pharmacist-led interventions from studies conducted between 2000 and 2010; however, this study did not analyse or report intervention characteristics specific to individual countries.²¹ A further scoping review on hospital pharmacy services (2015–2019) revealed diverse approaches within hospitals' scope of practice, comprising three subthemes: pharmaceutical care practice, clinical pharmacy services and public health services.²² Nevertheless, this review did not delve into the specific characteristics of clinical pharmacist interventions and highlighted their absence in certain countries.²²

Previous studies that evaluated the effectiveness of clinical pharmacy services in hospital settings have highlighted their demonstrable clinical,^{23–26} economical^{26–29} and humanistic^{30–34} benefits. However, despite evidence supporting their advantages, these services lack uniform integration across global healthcare systems.^{14 15} Literature shows that clinical pharmacy services are well-established in many UMICs and HICs,^{19 20} yet they are still in the developmental phase in low-income countries (LICs) and LMICs.^{35–37} Although numerous studies have highlighted the impact of pharmacist-led interventions in UMICs and HICs, very few reported from LICs or LMICs.^{35–37} Consequently, these services require reforms in these countries to leverage their expertise in improving health-related outcomes for their patients.^{14 20 35–37} Hence, there is a need to identify and collate all existing evidence and describe the types and characteristics of clinical pharmacy service models from UMICs or HICs that have been translated to LICs and LMICs.^{20 35 36} Additionally, identifying these practice models not only encourages their widespread use and long-term sustainability but also expands the evidence base in this area, paving the way for providers contemplating the implementation of these services in countries that currently lack them.¹⁹

Despite considerable research attention on the impact of pharmacist-led interventions, to the best of our knowledge, there are no reviews exploring the characteristics of multifaceted pharmacist-led interventions based on countries' socioeconomic status. Therefore, we intend to undertake a scoping review to explore the characteristics and types of multifaceted pharmacist-led interventions within secondary care settings and associated outcomes and identify any differences based on countries' socioeconomic status.

METHODS AND ANALYSIS

Design of the protocol

This protocol is reported in compliance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) protocols.³⁸ The scoping review will be conducted according to the Joanna Briggs Institute (JBI) Methodology for Scoping Reviews^{39–41} and reported according to the PRISMA Extension for Scoping Reviews.⁴² The PRISMA-P checklist was completed and can be seen in online supplemental appendix 1. The protocol was registered in Open Science Framework (doi.org/10.17605/OSF.IO/DNUVC). This method will be used to answer the following guiding questions:

Research questions

1. What types of multifaceted pharmacist-led interventions are reported in secondary care settings?
2. What are the reported outcomes of multifaceted pharmacist-led interventions in secondary care settings for patients, pharmacists, other health professionals and the broader health service?
3. Do reported interventions and outcomes differ between LICs, LMICs, UMICs and HICs?

Table 1 Review eligibility criteria based on study population, concept, context and types of studies

Review criteria	Inclusion	Exclusion
Population	Participants of adults aged over 18 years with chronic condition using care obtained from any secondary care services regardless of outcomes.	Evaluations of new technologies that do not include pharmacist involvement (eg, evaluating the feasibility of integrating laboratory testing methods into interventions).
Concept	The characteristics of pharmacist-led interventions and outcome assessments used to measure the effectiveness of these interventions on quality use of medication and patient safety.	Evaluations of new technologies included in the pharmacist-led interventions (eg, WhatsApp reminders for increased adherence).
	Any study conducted to evaluate the impact of pharmacist-led interventions collecting health-related clinical, humanistic and economic outcomes.	Studies involving exclusively pharmacy technicians, community pharmacists and pharmacy students.
	Interventions performed individually or within a multidisciplinary team.	
Context	Secondary care settings including hospital inpatient, outpatient clinics and community health centres in the community, where the interventions or activities are still conducted by hospital pharmacists considering these settings as part of secondary care.	Community pharmacies (primary care).
Types of studies	Primary (original) empirical research studies and full-text articles.	Review studies, guidelines and organisational recommendations, protocols, editorials, lectures, editor letters, books, book chapters. Articles of which we cannot obtain the full text such as abstracts presented at conferences.
	Any study design that reports on quantitative or qualitative types (eg, randomised controlled trials, quasi-experimental, cohort studies, cross-sectional studies and case reports).	
	Retrospective or prospective studies identifying the impact of pharmacist-led interventions will be considered. If a study includes both a hospital pharmacist and a technician, it can be included.	
	Articles written in English.	Articles written in other languages than English.
	Grey literature sources, such as International Pharmaceutical Abstracts and International Pharmaceutical Federation website.	

Eligibility criteria

The inclusion and exclusion criteria of the studies will align with the guiding questions, developed following the PCC acronym (population, concept and context) (table 1).³⁹ Articles that have been published in English will be included since we do not have access to translation resources. Articles published between January 2013 and December 2023 will be included to ensure the currency of practice and access to up-to-date information. Furthermore, the start date as 2013 was selected due to the recent

expansion and publication of global information on clinical pharmacist-led interventions in LICs and LMICs. For the purpose of this review, pharmacist-led interventions refer to activities carried out within a hospital setting, including governmental (public/state) and non-governmental (private) institutions by pharmacists. These activities may extend to the outpatient clinic or community health centre, with follow-up care continued by the hospital pharmacist. Pharmacist-led interventions can be considered for inclusion if they involve direct interaction

between the pharmacist and the patient. To classify multifaceted pharmacist-led interventions, it was decided to follow the same criteria used by Skjøt-Arkil *et al.*¹⁹ However, other eligibility criteria were decided according to questions specific for this review. To be included in this review, studies must:

1. Involve a pharmacist-led multifaceted intervention:

For the purpose of this review, multifaceted interventions will be categorized as

1. A medication review.
2. A medication review with additional services such as follow-up care in outpatient clinics or community health centres, conducted through face-to-face (in-person), face-to-face virtually (video) or telephone follow-up appointments in the community.

The medication review component includes the following four types of interventions, and studies will be included in the review if they include at least *three of four* components of a medication review. We decided to use the criteria used by Skjøt-Arkil¹⁹ for identifying multifaceted pharmacist-led interventions.

1. Medication history and reconciliation to identify the current accurate medication list.
 2. Medication review and communication of relevant clinical recommendations to multidisciplinary healthcare team.
 3. Patient or family conversations and education including medication or health-related behaviour changes.
 4. Generating discharge medication list and plan and communicating this to patients and health professionals in primary care.
2. Involve in-patient hospital setting and/or patients attending clinic visits as outpatients, with any chronic condition.
 3. Describe multifaceted interventions involving a patient or a group of patients delivered by a registered pharmacist working in a hospital.
 4. All studies meeting the above criteria will be included regardless of country or study design.

Search strategy

An initial limited search of MEDLINE (Ovid) and CINAHL (EbscoHost) was undertaken to identify articles on the topic. The text words contained in the titles and abstracts and index terms used to describe the articles of relevant articles were used to develop a full search strategy. The search terms used to identify the articles will be based on three key categories: pharmacist-led, types of interventions and secondary care. Literature search strategies will involve medical subject headings and relevant text words. Database-appropriate controlled vocabulary will be used. A preliminary search was conducted in MEDLINE (Ovid), using proximity search and relevant terms related to the research questions in November 2023. The final search was undertaken in December 2023 (Box 1). The planned start date for conducting the scoping review will be 28 March 2024, and it is anticipated that the reviews will be

Box 1 Search strategy (MEDLINE (Ovid))

1. (pharmacist* adj1 (impact or led or manage* or lead or deliv* or interven* or driven or initiat*)).mp.
2. Inpatients/ or Outpatients/ or Patient Discharge/ or Hospitalisation/ or Patient Admission/ or (hospital* or patient* or inpatient* or in-patient* or "inpatient" or outpatient* or out-patient* or "outpatient" or inhospital or in-hospital or patient admission or readmission or patient discharge).mp.
3. 1 and 2
4. ((medication* or drug* or prescri*) adj1 (review* or reconcil* or manage* or histor* or educat* or monitor* or counsel*)).mp.
5. pharmacist*.mp or Pharmacy Service, Hospital/ or Pharmacists/ or Pharmaceutical Services/ or exp Pharmacists/
6. 4 and 5 and 2
7. 3 or 6
8. limit 7 (English language and yr="2013–2023")

completed by 28 June 2024. A medical research librarian was consulted to advise on the development of the search strategy. A systematic search will be conducted using the following electronic databases: MEDLINE (Ovid), CINAHL (EbscoHost), Embase (embase.com), Scopus (scopus.com), Cochrane Library (cochranelibrary.com) and APA PsycInfo (Ovid). Reference lists of included full texts will be searched for relevant papers to ensure a comprehensive search of literature. As the review will be looking to inform the scope or characteristics of multifaceted pharmacist-led interventions and outcomes, pharmacy-related websites such as International Pharmaceutical Abstracts and International Pharmaceutical Federation (FIP) website will be searched for grey literature relevant to the topic. Supplementary searches for grey literature will also be conducted through Google Scholar to retrieve additional articles that may not be found in databases. Critical evaluation will be conducted on those resources to ensure they are not from predatory publishers. The search terms will be adapted for each individual database and/or information source, using truncation and Boolean operators. All retrieved literature will be treated in the same manner for eligibility. Articles published between January 2013 and December 2023 in English language will be included. Forward searching will involve scanning reference lists of identified full-text articles and review articles for additional papers of relevance, which will be screened for eligibility pertaining to the inclusion criteria. Conference abstracts, protocols and case reports will be excluded at this stage due to the limitations of evaluative benefit.

Study selection

Studies published investigating the impact of multifaceted pharmacist-led interventions and describing the types and characteristics of interventions will be included, regardless of the outcome assessed. Identified citations should discuss the multifaceted interventions conducted by pharmacists in the secondary care sector. These interventions would involve caring for patients, whether they

are inpatients, outpatients or those recently discharged from the hospital. Following the search, the articles obtained from electronic searches will be uploaded onto Covidence,⁴³ a reference management software. This will allow for the importing of citations, removal of duplicates and screening of titles, abstracts and full-text publications. Two authors will independently assess articles for inclusion criteria for the review to ensure relevance, then full texts will be examined. A flowchart will be continuously updated during the review process to outline search results, duplicates and screening outcomes. The results of the search will be reported in full in the final scoping review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-Analysis Extension for Scoping Review flow diagram.⁴² Data will be extracted using standardised forms that have been developed after a pilot study and evaluated by two or more reviewers. Any disagreements that arise between the reviewers during each stage of the selection process will be resolved through discussion or by involving additional reviewer(s). Countries of various income levels will be identified according to the World Bank classification.⁴⁴ A pilot study will involve each member reviewing 20% of the total includable sample titles/abstracts followed by a discussion to address any discrepancies. The article selection process will proceed once agreement reaches 75% or greater among the reviewers; then the review can be continued.³⁹

Data extraction

The following data will be extracted to gather specific details about the participants, concept, context, methods and key findings related to the review questions from the papers included in the scoping review. The data will be charted in a Microsoft Excel table format, to allow analysis and identification of key ideas. A draft extraction form will be piloted and modified and as necessary during the process. Any modifications will be detailed in the review. The following information from each eligible article will be extracted and recorded in a tabular format for descriptive synthesis:

1. Study characteristics such as the first author name, publication year, type of study design/evidence, country and category by the income level of the country.
2. Patient characteristics such as the type of included patients, sample size and demographics (sex and age).
3. Aim of the study and research methodology.
4. Secondary care pharmacist intervention characteristics such as component of the multifaceted pharmacist-led interventions, characteristics of intervention, intervention and/or comparator (if applicable), time length of intervention, use of electronic medical record or manual medical record and number and type of other healthcare professionals involved.
5. Types of the setting such as inpatient or outpatient and state hospital or private hospital.
6. Outcome characteristics such as the follow-up time and reported primary and secondary outcomes rele-

vant to this review. All types of outcomes will be analysed and divided into three categories:

1. Patient-reported outcomes, such as quality use of medicines (changes to medicine appropriateness, medication adherence and resolution of medication-related problems), quality of life (degree of disease or symptom control), hospital readmission and patient satisfaction;
2. Pharmacist-reported outcomes such as changes related to professional knowledge, skills and confidence, job satisfaction; and
3. Outcomes attributable to pharmacist involvement such as cost-effectiveness, impact on other healthcare professionals and the broader health service.

Presentation of the results

The analysis of the data will involve a descriptive numerical approach to explore the extent, nature and distribution of papers included in the review. The extracted data from the charting process will be presented in tabular form mapping the location of studies, types of studies/methodological design and interventions studied. Furthermore, a summarised narrative of the key concepts relating to the review question will be presented to identify any gaps in the literature and inform future research. As scoping reviews typically intend to map the available evidence, the analysis will be quite descriptive unlike systematic reviews which are used to inform the development of trustworthy clinical guidelines.⁴⁵ Therefore, the process is anticipated to be iterative, and the analysis will be reviewed throughout and discussed between the reviewers. This method will aim to classify and summarise the type of evidence available in this field, identifying further research recommendations.

Patient and public involvement

This study examines pre-existing research studies and, therefore, does not involve interactions with patients or the general public. However, this scoping review was developed and coauthored by a research team including health service researchers, health practitioners and academics that teach clinical pharmacy and health-related subjects in high-income and lower-middle income countries, thereby integrating a range of expertise and perspectives.

Ethics and dissemination

Ethics approval is not required for this scoping review as only published studies with non-identifiable data will be used. Findings will be disseminated in publications and presentations with relevant stakeholders.

DISCUSSION

Although clinical pharmacy services are well established in UMICs and HICs, it is still in the nascent stage in LICs and LMICs. Yet, there exists a significant/

compelling need to implement these services in such countries due to the lack of appropriate medication use and pressure on the healthcare staff. This scoping review will explore, analyse and present the evidence related to evaluating the impact of multifaced pharmacist-led interventions. Additionally, it intends to map the intervention characteristics based on the socio-economic status of the countries, offering guidance on the gradual and robust implementation of clinical pharmacy services in LICs and LMICs using UMICs and HIC models.

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Contributors All authors have contributed to the manuscript. The protocol was developed by JJTS, SSM, NRS, DAW, IDC and AJW reviewing the research questions, search strategy and terminology. JJTS wrote the first draft of the manuscript. SSM, NRS, DAW, IDC and AJW contributed to writing and reviewing the manuscript. All authors have reviewed and approved the final version of the manuscript and will be involved in conducting the scoping review.

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