

The Evolving Role of Pharmacists in Home Medication Review: A Scoping Review

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Abstract

Introduction: Irrational and inappropriate medication use remains a major global challenge. Home Medication Review (HMR) is a patient-centred service in which pharmacists conduct structured medication assessments in patients' homes to identify drug-related problems (DRPs), improve adherence, and optimise medication use. This scoping review aimed to map the evolving role of pharmacists in HMR, examine its impact on patient outcomes and quality of life, and identify barriers to pharmacist-led HMR implementation across different healthcare systems. **Methods:** A scoping review was conducted using the Arksey and O'Malley framework and reported in accordance with the PRISMA-ScR checklist. Databases including Scopus, CINAHL, PubMed, and Embase were searched for English-language original research studies published between 2015 and 2025. Studies involving pharmacists conducting HMR in patient's homes were included. **Results:** Out of 719 retrieved articles, 12 studies met the inclusion criteria. Most studies were conducted in Australia, followed by Malaysia and other countries. Pharmacist-led HMR was consistently associated with improved medication adherence, identification and resolution of DRPs, and improved patient outcomes and quality of life. Pharmacist's roles evolved from medication reconciliation and adherence assessment to comprehensive medication reviews, medicines optimisation, and multidisciplinary collaboration. Key barriers included patient-related factors, limited physicians support, system-level challenges, resource constraints, and workload pressures. **Conclusion:** Pharmacist-led HMR improves medication use, patient outcomes, and quality of life, with an increasingly advanced clinical role over time. Further large-scale research and strengthened implementation strategies are needed, particularly in low- and middle-income countries, to support wider adoption of pharmacist-led HMR services.

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Introduction

The irrational use and misuse of medications is a growing global concern, with 50% of patients using medications irrespective of their disease (Ofori-Asenso & Agyeman, 2016). Multiple medications are prescribed to older adults, resulting in a high prevalence of polypharmacy. According to the Fourth Australian Atlas of Healthcare Variation, approximately 40% of individuals aged 75 years and older dispensed five or more medications concurrently, qualifying as polypharmacy (ACSQHC, 2021). Home Medicines Review (HMR) is a consumer-oriented, systematic, and cooperative healthcare service delivered in community settings to enhance the quality of medication use and consumer comprehension (Castelino et al., 2010). A key component of HMR is medication reconciliation, during which pharmacists compile and verify a complete and accurate list of all medications used by the patient, including prescribed, over-the-counter, complementary, and herbal medicines. Following medication reconciliation and comprehensive medication assessment, pharmacists identify medication-related problems (MRPs), evaluate medication appropriateness, and provides a report to the referring healthcare professionals, detailing recommendations for addressing medication-related concern and then develops a customised medication management plan in collaboration with the patient (Chen et al., 2019; Chen, 2016). This process enables patients to actively participate in medication decision-making, which enhances adherence and improves treatment outcomes (Anika A, 2020).

The typical HMR workflow begins with a referral from a general practitioner. The pharmacist then conducts a home visit, performs medication reconciliation, assesses the patient's medications, and prepares a written report containing recommendations. The referring physician reviews these recommendations and develops a medication management plan in collaboration with the pharmacist and the patient, followed by implementation and appropriate follow-up, where required (Chen et al., 2019).

HMR represents an expanded clinical role of pharmacists from traditional dispensing to direct patient care through medication reviews and the identification of drug-related problems (DRPs). These activities significantly reduce medication errors and polypharmacy, improve therapeutic outcomes, lower healthcare costs, and enhance patients quality of life (QoL) and overall well-being (Gudi et al., 2019). Studies have shown that extensive and consistent implementation of HMR services can detect three to four DRPs per review (Chen et al., 2019; Jokanovic et al., 2016).

Traditional medication reviews have typically taken place in hospitals, community pharmacies, and general practice settings, where healthcare professionals engage in structured interactions with patients to optimise medication therapy (Gavazova et al., 2024). These approaches include pharmacist-led reviews in outpatient clinics, MTM programs, and collaborative reviews during ward rounds. Through these settings, professionals can educate patients and assess medication lists (Gavazova et al., 2024). Despite their benefits, traditional evaluation methods have limitations, including time constraints, restricted access to comprehensive patient data, and limited opportunities to evaluate the patient's living environment (McCormick et al., 2020).

In contrast, HMR is a personalised approach that allows for more thorough evaluations that enables in-depth discussions which are not always feasible in clinical environments (Abu Fadaleh et al., 2022). HMR also enables pharmacists to directly inspect all medicines available in the patient's home environment. This allows the identification of prescription medicines, over-the-counter (OTC) medicines, complementary and alternative medicines, as well as herbal and traditional medicines. Such a comprehensive assessment helps identify and resolve MRPs that might otherwise remain undetected (Gudi et al., 2019). The comparison between HMR and traditional medication review practices is presented in Table 1. Observing medication use and storage within the home also allows pharmacists to identify DRPs that may be missed in typical settings (McCormick et al., 2020).

Table 1. Comparison between traditional medication review methods and HMR

Feature	Traditional Methods	HMR
Setting	Hospitals, community pharmacies, general practices	Patient's home
Approach	Structured in-clinic interactions	Personalised, in-home assessment
Focus	Medication list review, protocol adherence	Comprehensive review, storage, and lifestyle factors

HMR has received significant interest across different healthcare systems, particularly in meeting the complex medication management needs of older persons (Sundus et al., 2024). Pharmaceutical care, initiated in the 1990s in America, spread rapidly to other nations, with trends including clinical services, cognitive services, medication management, and medication review, all adopting the philosophy of responsible drug therapy provision to achieve outcomes that improve QoL (Gudi et al., 2019). Australia has formally adopted HMR services through an extensive model where pharmacists review the complex regimens of older individuals at their homes (Chandrasekhar et al., 2019; Jokanovic et al., 2016). Slovenia became the first country in its region to implement and reimburse medication reconciliation as a pharmaceutical service, reflecting the global expansion of such practices (Nabergoj Makovec et al., 2018). In 2011, Malaysia adopted HMR through multidisciplinary team models, while other European countries developed pharmaceutical care approaches focusing on medication review (Sundus et al., 2024). These services, with some variations, aim to detect, solve, and prevent medication-related problems via structured assessments of patients' complete drug regimens, including prescription drugs, over-the-counter medications, and supplements (Ocampo et al., 2015; Satish et al., 2023).

The role of pharmacists is not limited to dispensing, as it has evolved significantly over time (Khanam, 2021). From apothecaries in ancient Egypt, Greece, and China to pharmacists in the 19th century (Feng, 2023), their responsibilities began shifting about fifty years ago toward clinical practice

in response to public health needs (Elfituri & Sherif, 2020). Pharmacists now collaborate with physicians in direct patient care, ward rounds, counselling, and monitoring DRPs (Francis & Abraham, 2014; Rockville (MD): Agency for Healthcare Research and Quality, 2024; Silviana et al., 2024). Their role has further expanded into vaccination awareness, research, and tele pharmacy (Feng, 2023; Poudel et al., 2019; Smith, 2023), and they are vital in polypharmacy management among older adults through HMR in collaboration with healthcare professionals (Chen, 2016; Seth et al., 2025).

The role of pharmacists in HMR has evolved and expanded significantly over the past decade. However, the existing literature is diverse across countries and healthcare systems, highlighting the need for a scoping review. HMR is an emerging field with limited research on the role of pharmacists in reviewing patient medications, preventing polypharmacy and related complications, and improving adherence and patient-centred care. This review aims to map the available literature on the evolving role of pharmacists in HMR, assess its impact on patient outcomes and QoL, and identify barriers to implementation. Ultimately, it seeks to highlight gaps in the literature and guide future research and practice.

Methodology

Study Design and Data Sources

The scoping review was conducted according to the Arksey and O'Malley (2005) five research steps methodological framework for scoping reviews (Arksey & O'malley, 2005) and reported following the Preferred Reporting Items

for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist (Tricco et al., 2018). A scoping review was selected because the objective of this study was to map the breadth of available literature on the evolving role of pharmacists in HMR, identify key interventions, outcomes, and barriers across different healthcare systems, and highlight gaps in the literature. Given the heterogeneity of study designs, populations, and outcomes, a scoping review was considered more appropriate than a systematic review, which is typically designed to answer a narrowly focused question and assess the quality of evidence (Munn et al., 2018). The following electronic databases, including Scopus, CINAHL, PubMed, and Embase, were searched between August and October to find relevant articles.

Search Strategy

A comprehensive search strategy was developed using the Boolean logic search strategy to find the relevant articles. This included: ("Home Medication Review" OR "HMR") AND ("pharmacist" OR "clinical pharmacist" OR "community pharmacist" OR "pharmacy practice") AND ("role" OR "evolution" OR "impact" OR "barriers" OR "facilitators" OR "patient outcomes").

Research Questions

The research questions were developed using the Population, Concept, and Context (PCC) framework provided by the Joanna Briggs Institute (JBI) (UniSA, 2025). According to this framework, the "Population (P)" was pharmacists involved in providing HMR; the "Concept (C)" was the evolving roles of pharmacists in HMR; and the "Context (C)" was home settings of patients where HMR is conducted across different healthcare systems worldwide. Based on this, the primary research question was: How has the role of pharmacists evolved over time in HMR? The secondary questions included: What are the activities pharmacists perform while conducting HMR? How is HMR associated with improvements in patient outcomes? What activities and tools do pharmacists use in HMR? How does the pharmacist

role in HMR vary across countries and healthcare systems? What are the barriers to pharmacist involvement in HMR?

Inclusion and Exclusion Criteria

Studies published between 2015 and 2025 were included because the objective of this review was to evaluate the contemporary evolution of pharmacists' roles in HMR. Restricting the search to recent literature ensured that the review reflected current HMR practices while maintaining a relevant and manageable evidence base. Only studies published in English were considered. Original research studies, including qualitative, quantitative, and mixed-methods studies, evaluating the role of pharmacists in HMR carried out at patients' homes were included. Studies not involving pharmacists and review articles such as narrative reviews, systematic reviews, meta-analyses, and other non-original articles, were excluded. Studies conducted exclusively in nursing homes, residential aged care facilities, and long-term care institutions were also excluded because medication review services delivered in institutional settings differ substantially from community-based HMR, which may influence pharmacists' roles and reduce comparability with home-based HMR services.

Study Selection

The primary screening of all retrieved articles was conducted, with studies categorised as relevant, irrelevant, or uncertain. Then all articles were discussed by three researchers (MJH, MAB, MAM) to check their appropriateness and identify which articles were relevant while removing the irrelevant or unsure articles. After all relevant articles were identified, they were assessed further by their titles and abstracts following the inclusion and exclusion criteria by two researchers (SZA and KMB). Then full-text articles were screened by all the authors and relevant articles were identified and data was extracted. Any disagreements during title/abstract or full-text screening were resolved through discussion and reached by consensus among the authors.

Data Extraction

The relevant data was extracted from the

selected articles using a standard data collection procedure for scoping reviews. A research matrix table was created using Microsoft Excel and data items included: Sr. no, title, author, year, country, aims/objectives, study design, sample size, outcomes (primary and secondary), tools used, major findings (with statistical values), and barriers to pharmacists while conducting home medication reviews. Once all primary data was extracted, it was reviewed by one author (MJH). Then this data was categorised and summarised in the form of tables.

Results

A total of 719 research articles were retrieved from the databases: Scopus (n=35), CINAHL (n=614), PubMed (n=14), and EMBASE (n=56). After removing 265 duplicates, 454 articles

remained for screening. Of these, 188 were excluded according to the predefined inclusion and exclusion criteria: 25 studies were unrelated to HMR, 57 did not address the role of the pharmacist, 94 were not original research articles, and 12 were not published in English. Consequently, 266 articles proceeded to the full-text review. During the full-text assessment, 254 additional articles were excluded: 76 only mentioned HMR without discussing it in depth, 68 lacked information regarding the pharmacist's role in HMR, 53 were not original research articles, and 57 were either inaccessible or not available in English. Ultimately, 12 studies met the inclusion criteria and were included in the review. Figure 1 presents the PRISMA flow diagram of study selection process and the detailed summary of the included studies is given in Table 2.

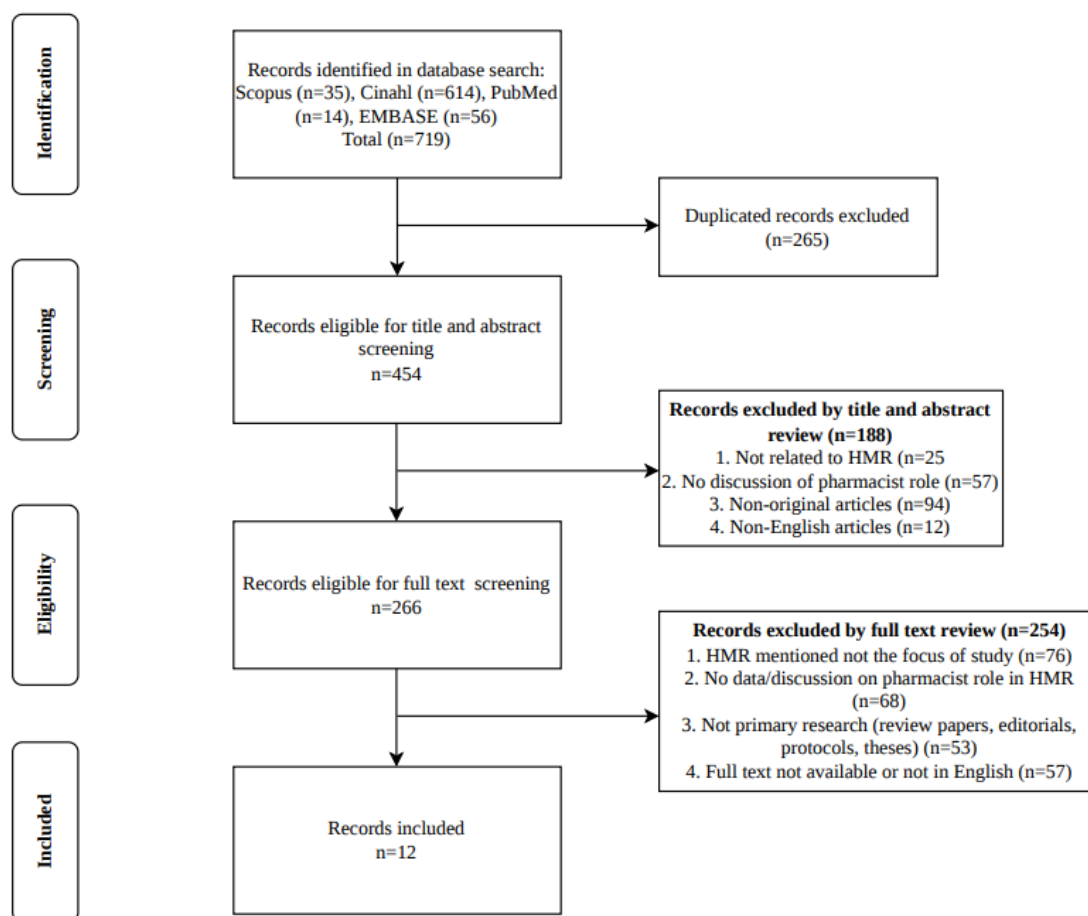


Fig 1. PRISMA-ScR flowchart of included studies

Study Design, Interventions, and Outcomes

Most of the included studies employed a randomised controlled trial (RCT) study design (n=4), followed by cross-sectional (n=4), retrospective cohort analysis (n = 2), prospective cohort analysis (n=1), and prospective longitudinal (n=1) study designs. Depending on the setting and patient group, each study had different interventions and outcomes. The most common outcome was improved medication adherence as a primary and secondary outcome among patients receiving HMR (Al-Qudah et al., 2018; Alalawneh et al., 2022; Chandrasekhar et al., 2019; Rosli et al., 2021; Sarwar et al., 2025; Tan et al., 2019).

Some studies focused on DRPs such as wrong doses, side effects, interactions, or medicine expiry (Al-Qudah et al., 2018; Chandrasekhar et al., 2019; Papastergiou et al., 2019; Patounas et al., 2021). Some studies used HMR to measure clinical results such as better blood sugar control in diabetes (Rosli et al., 2021), improved knowledge and QoL for people with schizophrenia (Tan et al., 2019), or improvements in COPD symptoms (Sarwar et al., 2025). Some studies focused on patient demographics and utilisation of HMR services (Du et al., 2019; Sluggett et al., 2024; Sluggett et al., 2022; Sluggett et al., 2021). Pharmacists consistently identified and resolved DRPs during the HMRs (Al-Qudah et al., 2018; Chandrasekhar et al., 2019; Papastergiou et al., 2019; Patounas et al., 2021).

Distribution of Studies by Country

Most of the studies were conducted in Australia (n = 6) (Du et al., 2019; Patounas et al., 2021; Sarwar et al., 2025; Sluggett et al., 2024; Sluggett et al., 2022; Sluggett et al., 2021), highlighting their developed healthcare system, especially the role of pharmacists, followed by Malaysia (n = 2) (Rosli et al., 2021; Tan et al., 2019), then Jordan (n = 1) (Al-Qudah et al., 2018), India (n = 1) (Chandrasekhar et al., 2019),

Canada (n=1) (Papastergiou et al., 2019), and the United Kingdom (n=1) (Alalawneh et al., 2022).

Pharmacist Roles and Activities in HMR

Among the included studies, several pharmacist-led HMR activities were consistently observed, including medication reconciliation, patient counselling and education, adherence monitoring, deprescribing practices, medicines optimisation, and the identification of high-risk prescriptions. Medication reconciliation was reported in 10 studies (Al-Qudah et al., 2018; Chandrasekhar et al., 2019; Papastergiou et al., 2019; Patounas et al., 2021; Sarwar et al., 2025; Sluggett et al., 2024; Sluggett et al., 2022; Sluggett et al., 2021; Tan et al., 2019), while patient counselling and education, medication optimisation and therapy management as well as adherence monitoring, were reported in almost all included studies (Al-Qudah et al., 2018; Alalawneh et al., 2022; Chandrasekhar et al., 2019; Papastergiou et al., 2019; Patounas et al., 2021; Sarwar et al., 2025; Sluggett et al., 2024; Sluggett et al., 2022; Sluggett et al., 2021; Tan et al., 2019). Deprescribing interventions were less frequent but still notable, being identified in seven studies (Al-Qudah et al., 2018; Chandrasekhar et al., 2019; Papastergiou et al., 2019; Patounas et al., 2021; Rosli et al., 2021; Sarwar et al., 2025; Sluggett et al., 2022). Similarly, identification and monitoring of high-risk prescriptions were described in ten studies (Al-Qudah et al., 2018; Du et al., 2019; Papastergiou et al., 2019; Patounas et al., 2021; Rosli et al., 2021; Sarwar et al., 2025; Sluggett et al., 2024; Sluggett et al., 2022; Sluggett et al., 2021; Tan et al., 2019). Only one study reported independent prescribing practices, highlighting the limited implementation of this activity in current clinical settings (Chandrasekhar et al., 2019).

Table 2: Summary of included studies

Sr. No	Author (Year)	Country	Study Design	Sample Size	Aim	Outcomes	Major Findings
1	Al-Qudah et al. (2018)	Jordan	Randomised controlled trial	97 patients	Examine the effects of HMR on chronic patients medication compliance	Primary: Adherence to medication Secondary: Clinical measurements and therapy related problems (TRPs)	Intervention group adherence rate: 33.3%, control group: 14.3% ($p = 0.027$). Decreased non-adherence ($p < 0.001$)
2	Chandrasekhar et al. (2019)	India	Cross-sectional	85 patients	Identify problems related to medications, enhance pharmacotherapy through HMR	Primary: Improved medication adherence Secondary: Minimisation of medication errors	Medication adherence improved ($p < 0.05$)
3	Du et al. (2019)	Australia	Prospective cohort analysis	131,483 patients	Identification of the sociodemographic characteristics of older adults receiving HMR	Primary: Identify older adults receiving HMR. Secondary: Link between HMR and sociodemographic factors	Older adults on 10 or more drugs more likely to receive HMR ($p < 0.001$)
4	Tan et al. (2019)	Malaysia	Prospective longitudinal study	133 patients	Evaluate the effects of hospital pharmacist-led HMR on schizophrenia patients adherence, antipsychotic knowledge, and QoL	Primary: Medication adherence Secondary: QoL	Medication adherence increased from 56.68% to 90.37% ($p < 0.001$). Improved family and social QoL ($p < 0.001$)
5	Papastergiou et al. (2019)	Canada	Cross-sectional	100 patients	Assess the effectiveness of pharmacist-led HMR in resolving drug therapy problems (DTPs) and improve medication safety	Primary: DTPs in home-visits Secondary: Identify medication issues, expired drugs, Adverse drug reactions (ADRs)	Identified and resolved DTPs, non-adherence, and ADRs
6	Rosli et al. (2021)	Malaysia	Randomised controlled trial	166 patients	Assess the effects of HMR by the community pharmacists on the glycaemic management and other outcomes in T2DM patients	Primary: Change in HbA1c from baseline to 6 months. Secondary: Fasting blood glucose, blood pressure, lipid profile, medication adherence	HbA1c dropped by -0.91% ($p = 0.004$), fasting blood glucose (FBG) dropped, increased medication adherence ($p < 0.001$)

Table 2: Summary of included studies (cont.)

Sr. No	Author (Year)	Country	Study Design	Sample Size	Aim	Outcomes	Major Findings
7	Patounas et al. (2021)	Australia	Cross-sectional	255 patients	To quantify and characterise the time pharmacists invest in each stage of HMR	Primary: Pharmacists role in resolving DRPs. Secondary: Investigate correlations between demographics and time allocation for each HMR stage	Extended consultation indicate complexity, inefficiency, and warranting further investigation, Pharmacist spend 3 hours on HMR during report collation and writing stage.
8	Sluggett et al. (2021)	Australia	Cross-sectional	14,900 patients	Examine national trends in HMRs and Residential Medication Management Reviews (RMMRs)	Primary: Rates of HMRs per 1000 older Australians Secondary: Variations in demographic factors and medication safety	Significant decreases in HMRs and RMMRs ($p < 0.05$)
9	Alalawneh et al. (2022)	United Kingdom	Randomised controlled trial	138 patients	Evaluate the clinical pharmacist-led Home Medication Management Review (HMMR) in patients	Primary: Medication adherence in Syrian Refugees. Secondary: Identify TRPs	Improved medication adherence ($p < 0.001$)
10	Sluggett et al. (2022)	Australia	Retrospective cohort study	57,719 patients	Investigate the impact of RMMRs and HMRs on hospitalisation and the mortality risk	Primary: All-cause mortality. Secondary: Hospitalisations and emergency department presentations	A significant reduction in all-cause mortality with HMR ($p = 0.02$), while no significant differences were observed for hospitalisations ($p = 0.38$ and 0.17)
11	Sluggett et al. (2024)	Australia	Retrospective cohort study	3,060 patients	Analyse relationships between hospitalisation, long term care facilities (LTCFs) entrance, and mortality among older adults receiving in-home aged care and HMR	Primary: All-cause mortality. Secondary: Unplanned hospitalisations	No significant effect on mortality, hospitalisations, or LTCFs enrollment.
12	Sarwar et al. (2025)	Australia	Randomised controlled trial	81 COPD patients	Assess the impact of pharmacist-conducted HMR focused on treatable traits in COPD patients	Primary: Improvement in health-related QoL Secondary: Improvements in anxiety, depression, health status, treatment adherence, and smoking cessation	Significant improvements in QoL, health status, anxiety, depression, smoking cessation, and adherence

Different tools used in HMR activities across the studies. Commonly used tools across the studies included structured interviews, checklists, standardised data-collection forms, pill counts, adherence assessment scales, and administrative or registry data sources (Al-Qudah et al., 2018; Chandrasekhar et al., 2019;

Du et al., 2019; Papastergiou et al., 2019; Rosli et al., 2021; Sarwar et al., 2025; Sluggett et al., 2024; Tan et al., 2019). Table 3 and 4 represents the overview of the pharmacist's roles and activities in HMR and tools used in HMR in included studies respectively.

Table 3: Overview of pharmacist roles and activities in HMR

Author (Year)	Medication Reconciliation	Counseling / Education	Adherence Monitoring	Deprescribing	Independent Prescribing	Medications Optimisation	Identifying High-Risk Prescriptions / Monitoring
Al-Qudah et al. (2018)	✓	✓	✓	✓	✗	✓	✓
Chandrasekhar et al. (2019)	✓	✓	✓	✓	✓	✗	✗
Du et al. (2019)	✗	✗	✗	✗	✗	✗	✓
Tan et al. (2019)	✓	✓	✓	✗	✗	✓	✓
Papastergiou et al. (2019)	✓	✓	✓	✓	✗	✓	✓
Rosli et al. (2021)	✓	✓	✓	✓	✗	✓	✓
Patounas et al. (2021)	✓	✓	✓	✓	✗	✓	✓
Sluggett et al. (2021)	✓	✓	✓	✗	✗	✓	✓
Alalawneh et al. (2022)	✗	✓	✓	✗	✗	✓	✗
Sluggett et al. (2022)	✓	✓	✓	✓	✗	✓	✓
Sluggett et al. (2024)	✓	✓	✓	✗	✗	✓	✓
Sarwar et al. (2025)	✓	✓	✓	✓	✗	✓	✓

Table 4: Tools used in HMR

Author (Year)	Tools Used
Al-Qudah et al. (2018)	8-Item Morisky Medication Adherence Scale (MMAS-8), structured adherence forms, pill counts, and patient interviews
Chandrasekhar et al. (2019)	Structured checklist and interviews
Du et al. (2019)	Administrative health data, Pharmaceutical Benefits Scheme (PBS), Medicare Benefits Schedule (MBS), and hospitalisation records
Tan et al. (2019)	Medication Adherence Rating Scale, pill count, Sheehan Disability Scale, and knowledge questionnaire
Papastergiou et al. (2019)	Standardised data collection forms and questionnaires to assess medication management, organisation, and patient understanding
Rosli et al. (2021)	EuroQol-5 Dimensions, 5 Levels (EQ-5D-5L) and Michigan Diabetes Knowledge Test (MDKT) questionnaires
Patounas et al. (2021)	Electronic survey using database
Sluggett et al. (2021)	Patient medical records, prescriptions, and predefined data collection
Alalawneh et al. (2022)	Self-completed questionnaires
Sluggett et al. (2022)	Medical records and prescriptions
Sluggett et al. (2024)	Administrative claims data, medication dispensing records, and registry .
Sarwar et al. (2025)	Tool for Adherence Behaviour Screening (TABS), COPD Assessment Test (CAT), Hospital Anxiety and Depression Scale (HADS), spirometry, Charlson Comorbidity Index (CCI), modified Medical Research Council Dyspnoea Scale (mMRC), and St. George's Respiratory Questionnaire (SGRQ)

Barriers to Pharmacist-led HMR

The most frequently reported barrier to pharmacist-led HMR services was patient related issues including limited awareness about HMR and poor medication adherence. This barrier was identified across the majority of studies (n=11), demonstrating its widespread influence on the effectiveness of HMR programs (Al-Qudah et al., 2018; Patounas et al., 2021; Sarwar et al., 2025; Sluggett et al., 2024; Sluggett et al., 2021). Another highly common challenge was insufficient physician support such as low referral rates and poor interprofessional collaboration which was

highlighted in several studies (n=10), (Chandrasekhar et al., 2019; Patounas et al., 2021; Sarwar et al., 2025; Sluggett et al., 2024; Sluggett et al., 2022; Sluggett et al., 2021; Tan et al., 2019). System-level issues including difficulties in accessing patient data, lack of integrated systems, and complexities associated with polypharmacy, also emerged as notable barriers (n=9) (Alalawneh et al., 2022; Du et al., 2019; Patounas et al., 2021; Rosli et al., 2021; Sarwar et al., 2025; Sluggett et al., 2024; Sluggett et al., 2022; Sluggett et al., 2021). Additionally, resource constraints, particularly

related to inadequate staffing and funding, were reported in many studies (n=7), as limiting the scalability and sustainability of HMR services (Al-Qudah et al., 2018; Du et al., 2019; Patounas et al., 2021; Sluggett et al., 2024; Sluggett et al., 2022; Sluggett et al., 2021). Lastly, workload pressures, including time

limitations and competing responsibilities, were identified as significant barriers to the routine implementation of HMR in various practice settings (n=5) (Du et al., 2019; Patounas et al., 2021; Sluggett et al., 2024; Sluggett et al., 2022; Sluggett et al., 2021).

Table 5: Overview of barriers to pharmacist-led HMR

Author (Year)	Patient-related issues (unawareness, adherence etc.)	Physicians support issues	Resource constraints (staffing, funding)	Workload pressures	System-level issues (data, polypharmacy)
Al-Qudah et al. (2018)	✓	✗	✓	✗	✗
Chandrasekhar et al. (2019)	✓	✓	✗	✗	✗
Du et al. (2019)	✓	✓	✓	✓	✓
Tan et al. (2019)	✓	✓	✗	✗	✗
Papastergiou et al. (2019)	✓	✗	✗	✗	✗
Rosli et al. (2021)	✓	✗	✗	✗	✓
Patounas et al. (2021)	✓	✓	✓	✓	✓
Sluggett et al. (2021)	✓	✓	✓	✓	✓
Alalawneh et al. (2022)	✓	✓	✗	✗	✓
Sluggett et al. (2022)	✓	✓	✓	✓	✓
Sluggett et al. (2024)	✗	✓	✓	✗	✓
Sarwar et al. (2025)	✓	✓	✓	✓	✓

Evolution of Pharmacist Role in HMR

Pharmacist role in HMR evolved significantly over the past decade. From 2018 to 2019, the role primarily focused on the identification of therapy-related problems, patient counselling, and adherence assessment using structured tools such as MMAS-8, pill counts, and patient interviews (Al-Qudah et al., 2018; Chandrasekhar et al., 2019; Du et al., 2019; Papastergiou et al., 2019; Tan et al., 2019). Between 2020 and 2021, the pharmacist’s role expanded to include comprehensive medication reviews, collaboration with general practitioners, and the preparation of medication safety and use reports, supported

by health data, structured questionnaires, and assessments of patient knowledge (Patounas et al., 2021; Rosli et al., 2021; Sluggett et al., 2021). In the recent period (2022-2025), the pharmacist’s responsibilities evolved further toward multidisciplinary team integration, medicines optimisation, advanced medication management, MRP assessment, and smoking-cessation counselling, with the use of more advanced tools such as spirometry, enhanced adherence scales, and administrative health data (Alalawneh et al., 2022; Patounas et al., 2021; Sarwar et al., 2025; Sluggett et al., 2024; Sluggett et al., 2022; Sluggett et al., 2021). Table 6 presents the summary which shows that how pharmacist role in HMR evolved over time.

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Table 6. Summary of evolving role of pharmacist in HMR

Period	Characteristics of Pharmacist Role
2018-2019	Medication reconciliation, TRP identification, patient counselling, and adherence assessment using structured tools like MMAS-8, pill counts, and patient interviews.
2020-2021	Expanded role to conducting comprehensive medication reviews, liaising with healthcare providers (general practitioners), and generating reports for medication safety and use. Tools included health data, structured questionnaires, and patient knowledge assessments.
2022-2025	Integration with multidisciplinary teams, medicines optimisation, and advanced medication management. Roles also include collaborating with healthcare providers, assessing MRPs, and offering smoking cessation counselling. Tools evolved to include spirometry, medication adherence scales, and administrative health data.

2

Discussion

As healthcare systems worldwide continue to evolve, the role of pharmacists in HMR programs is gaining increasing recognition and significance. Their role is shifting towards better medication adherence among patients while simultaneously contributing to a reduced incidence of side effects and ADRs over time (Kassim & Pei, 2023). This scoping review aimed to explore the evolving role of pharmacists in HMR and identify its impact on patient clinical outcomes and quality of life, and also to identify the barriers that limit the involvement of pharmacists in HMR. A total of 12 original research studies were included in this review, highlighting the role of pharmacists in HMR in improving medication adherence and minimising side effects.

The geographical distribution of studies was predominantly from developed countries such as Australia, Canada, the UK, and Malaysia, reflecting their strong healthcare infrastructure, pharmacist involvement, and well-established primary care systems. Australia contributed half of the included studies (n=6) (Du et al., 2019; Patounas et al., 2021; Sarwar et al., 2025; Sluggett et al., 2024; Sluggett et al., 2022; Sluggett et al., 2021). This concentration reflects the long-standing establishment and maturity of Australia’s HMR program, which was introduced in 2001 under the Medicare Benefits Schedule as part of the National Medicines Policy. The program provides a structured, government-funded framework for accredited pharmacists to conduct comprehensive in-home medication assessments in collaboration

with general practitioners. This well-developed infrastructure has supported extensive research and implementation of HMR services compared with many other countries (DOHAC, 2023; Patounas et al., 2021). In contrast, only two study was from a developing country, which indicates the gap in research and implementation of HMR in developing and lower-middle-income countries (Al-Qudah et al., 2018; Chandrasekhar et al., 2019), and shows a weak healthcare system and lack of pharmacist interventions and involvement in healthcare settings in such countries.

Our findings highlighted the role of pharmacist-led HMR, which consistently improves medication adherence, reduces side effects, improves patient's QoL, and resolves DRPs in patients with polypharmacy and chronic diseases. These findings are consistent with the study conducted by Marcum et al. (2021) (Marcum et al., 2021), which highlights that pharmacist-led interventions improve patient outcomes and medication adherence in older adults. The findings of our study showed that the most common roles and activities performed by pharmacists include medication reconciliation, identification of DRPs/TRPs, patient counselling, adherence assessment, medication review and optimisation, and communication or liaison with prescribers and other healthcare settings (Abbott et al., 2020; M. Craske et al., 2024; M. E. Craske et al., 2024; Kassim & Pei, 2023; Lexow et al., 2022; Marcum et al., 2021; Salom-Garrigues et al., 2024).

It was found that the common tools used for HMR in the included studies include structured interviews, DRP checklists, standardised data-collection forms, pill counts, adherence assessment scales, and administrative or registry data sources (Al-Qudah et al., 2018; Alalawneh et al., 2022; Chandrasekhar et al., 2019; Du et al., 2019; Papastergiou et al., 2019; Patounas et al., 2021; Rosli et al., 2021; Sluggett et al., 2021; Tan et al., 2019). The tools such as structured interviews, adherence evaluation forms, standard forms, patient registry data, and pill counts were also found to be effective in recent studies (Abbott et al., 2020; Kassim & Pei, 2023; Lexow et al.,

2022). However, tools such as bespoke data collection forms and the Cochrane Effective Practice and Organisation of Care (EPOC), which were found to be beneficial in HMR programs in recent studies, but were not highlighted in the recent research studies included in our review (M. E. Craske et al., 2024). This indicates the need for further exploration of these tools to evaluate their effectiveness in HMR on a broader scale.

The most frequently reported barriers to HMR that were highlighted were patient-related issues, including limited awareness about medications, poor medication adherence, and insufficient physician support. These barriers were identified across the majority of studies, demonstrating their widespread influence on the effectiveness of HMR programs (Al-Qudah et al., 2018; Patounas et al., 2021; Sluggett et al., 2024; Sluggett et al., 2022; Sluggett et al., 2021).. These barriers need to be addressed and overcome, including gaps in inter-professional communication and factors related to patient involvement, through proper training, education, and other initiatives, this can enhance the effectiveness of pharmacist-led HMRs more significantly.

Pharmacist-led HMRs have gradually changed from simple medication checks to focused, patient-centered actions aimed at medication safety, adherence, and reducing unnecessary prescriptions. A systematic review by Abbott et al. (2020) found that home visits by pharmacists significantly reduce medication-related issues, especially in high-risk groups (Abbott et al., 2020). Similarly, in recent studies, it was found that HMRs help to improve adherence to chronic medications, including antidiabetics, showing clear clinical benefits (Kassim & Pei, 2023; Marcum et al., 2021). Studies also found that pharmacist-led reviews, connecting structured assessments, patient education, and follow-up, result in better patient outcomes (M. Craske et al., 2024; M. E. Craske et al., 2024).

A recent study by Salom-Garrigues et al. (2024) emphasised the importance of incorporating HMRs into home healthcare programs, reinforcing pharmacists as key members of interdisciplinary teams (Salom-Garrigues et al.,

2024). This growing recognition of pharmacists in the healthcare system highlights their significant role in ensuring that patients receive appropriate therapy and that their clinical outcomes are improving. Pharmacist-led HMR is particularly significant for patients dealing with long-term health issues and chronic diseases. This minimises MRPs, reduces adverse events, improves medication adherence, and enhances the effectiveness of treatment therapy and patient's QoL. This evolving role of pharmacists highlights the need for their role to be recognised globally so, they can contribute more significantly to the wellbeing of patients (Liou et al., 2021; Nguyen et al., 2023; Salom-Garrigues et al., 2024).

Beyond improving clinical outcomes, pharmacist-led HMR may reduce healthcare expenditure by improving medication adherence, resolving DRPs, and reducing ADRs, HMR services can lower overall healthcare resource utilisation, including fewer hospitalisations and emergency department visits, while providing a convenient, patient-friendly home-based approach (Rosli et al., 2021). Despite the costs associated with pharmacist involvement and program administration, available economic evaluations demonstrate that HMR has the potential to be cost-effective (Sarwar et al., 2025). This is achieved by promoting optimised medication use and preventing complications, particularly among older adults with polypharmacy (DOHAC, 2023).

Study Significance

Although HMR services are becoming more common, there is no such study available that has discussed the evolving role of pharmacists in HMR specifically. This study fills this gap by mapping the evolving role of pharmacists in HMR and highlighting that how this improves the medication management and patient outcomes. The findings of our study offer useful insights for both pharmacists and policymakers, pointing out ways to enhance pharmacist's involvement in HMR by highlighting the existing barriers to pharmacist-led HMRs. It also highlights the importance of targeted training and other

initiatives to support the evolving role of pharmacists in HMR. Additionally, the study highlights that with the growing recognition of pharmacists worldwide, there is a need for further research and wider implementation of pharmacist-led HMR services, particularly in lower- and middle-income countries, to strengthen healthcare systems in these regions.

Strengths and Limitations

The strengths of this study include that it was conducted using established guidelines, including the Arksey and O'Malley methodological framework for scoping reviews and the PRISMA-ScR checklist, to ensure clarity and transparency. A broad literature search was performed across major databases to identify relevant studies, while focusing on pharmacists providing HMR at patient's homes ensures that the evidence directly relates to this specific clinical role. Including recent studies provides insights into recent changes and the growing responsibilities of pharmacists over the past decade. However, the review is limited by the small number of available studies on HMR that discussed the role of pharmacists and by the inclusion of only English-language publications, which might lead to the exclusion of some important relevant studies which are available in different languages. Due to the scoping nature of the review, the quality of included studies was also not assessed, and some relevant articles could not be included because the full texts were not accessible.

Moreover, HMR models and equivalent pharmacist-led HMR services vary considerably across countries and healthcare systems in terms of referral pathways, pharmacist prescribing authority, reimbursement mechanisms, multidisciplinary collaboration, and healthcare infrastructure, which may affect the interpretation and generalisability of the present findings.

Conclusion

This study highlights that pharmacist-led HMR significantly improves medication adherence, reduces DRPs, and improves patient outcomes and QoL, and that their role has substantially

evolved and strengthened over time. These findings strongly support the clinical value of pharmacists in optimising medication use and enhancing patient safety in the healthcare system. However, the limited evidence regarding the role of pharmacists in HMR from developing and low- and middle-income countries represents a major gap in the literature. Robust future research and addressing the barriers to pharmacist-led HMR, particularly on a large scale with multicentre studies, are essential to further establish and recognise the pharmacist's role in HMR and to drive meaningful improvements in patient outcomes across diverse healthcare systems.

Authors Contribution

MJH: Conceptualisation, data searching, data curation, study selection, articles selection and screening, data extraction, analysis, investigation, and original draft writing. MAM: Data searching, articles selection and screening, and review and editing of the manuscript. KMB: Articles selection and screening, and review of the manuscript. MA: Data searching, study selection, articles selection and screening. SZA: Articles selection and screening, and editing of the manuscript. NSA: study selection and conceptualisation. All authors have read and approved the final manuscript.

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Conflict of Interest

The authors have no relevant conflicts of interest to disclose regarding this research.

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Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this manuscript, AI-assisted tools, including ChatGPT 5.0 (OpenAI), were employed solely to enhance language clarity and readability. All AI-generated outputs were critically reviewed, verified for accuracy, and substantially edited by the author. The author affirms full responsibility for the integrity, validity, and final content of the manuscript.

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