

Pharmaceutical Care in Primary Health Centers: A Systematic Literature Review on Prescription Services and Patient Counseling

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ABSTRACT

This study aims to systematically review the implementation of prescription services and pharmaceutical counseling within primary health centers and to identify key challenges, outcomes, and improvement strategies reported in recent literature. A systematic literature review was conducted using peer-reviewed articles published between 2017 and 2024, sourced from international Scopus-indexed journals and nationally accredited journals. A total of 20 studies met the inclusion criteria, consisting of cross-sectional, observational, qualitative, mixed-methods, and quasi-experimental designs. The findings indicate that administrative and pharmaceutical screening of prescriptions is generally implemented adequately, while clinical prescription review and patient counseling remain inconsistent and underdeveloped. Pharmacist-led interventions, including medication review and structured counseling, were consistently associated with improved patient knowledge, medication adherence, reduced drug-related problems, and increased patient satisfaction. However, barriers such as limited human resources, high workload, insufficient infrastructure, and lack of standardized counseling guidelines constrain optimal service delivery

INTRODUCTION

Pharmaceutical services in community health centers are an important component of the primary health care system because they are responsible for drug management, prescription dispensing, and providing information to patients about their drug therapy. Recent studies show that the implementation of clinical pharmacy services in primary facilities can improve patient safety and therapeutic outcomes when done properly. Challenges at the puskesmas level include limitations in pharmacist staffing, infrastructure, and integration with other health teams, which impact the quality of prescription and counseling services. Globally, efforts to improve patient safety focus on reducing medication errors that often occur in the medication chain in primary care. Therefore, a systematic review of prescription and counseling practices in health centers is important to describe the evidence, barriers, and policy recommendations (Kaae et al., 2021; Sabater-Hernández et al., 2022).

Medication safety is a major concern for the WHO, which has launched the Medication Without Harm initiative to reduce the impact of medication errors at all levels of health care, including primary care. The risk of medication errors in community health centers can arise during the diagnosis process, prescription writing, medication dispensing, or during patient counseling, thus requiring an integrated approach. International literature reviews emphasize that effective counseling practices by pharmacists reduce the incidence of medication-related events and improve treatment adherence. In many low- and middle-income countries, improving medication management and staff training are the main recommended interventions. Reviewing empirical evidence on these interventions will help formulate implementation guidelines in the context of community health centers (World Health Organization, 2017; Salgado et al., 2023).

The rational drug use indicators developed by the WHO are widely used to assess the quality of prescription services in primary facilities; findings from various countries show large variations in compliance with these indicators. Recent evaluations have identified problems such as the high proportion of antibiotics prescribed without clear indications, lack of dosage documentation, and polypharmacy practices in some PHCs. These prescribing problems not only impact the effectiveness of therapy but also contribute to antimicrobial resistance, which is a global public health crisis. Therefore, a systematic literature review is needed to gather evidence on prescribing patterns and determinants in health centers. The results will be relevant for resistance control strategies and improving prescription quality in primary care (Ofori-Asenso & Agyeman, 2018; Alshammari et al., 2018).

The role of pharmacists and other pharmacy personnel in puskesmas services is increasingly recognized as a key factor in improving prescription quality and patient counseling. Reviews and experimental studies show that pharmacist-led interventions – including medication reviews, interaction checks, and structured counseling – have a positive impact on clinical outcomes and patient satisfaction. However, the full implementation of pharmacists' roles at the primary level is still hampered by regulations, remuneration models, and the

perceptions of other professions in the health team. Capacity building and clear task definitions are needed to optimize the contribution of pharmacists in community health centers. Systematic reviews can summarize the evidence of the effectiveness of various models of pharmacist involvement at the primary level (Showande & Laniyan, 2019; Mekonnen et al., 2020).

Patient counseling practices in primary care are not only about conveying information, but also involve communication techniques, assessing patient understanding, and follow-up to ensure compliance and detect side effects. Survey research on community and clinical pharmacists reports variations in the quality and frequency of counseling, as well as differences between what health workers report and patients' experiences. Factors that influence the quality of counseling include consultation time, communication training, and the availability of educational materials. In many studies, patients reported that comprehensive counseling increased their confidence in medication use and reduced concerns about therapy. Therefore, examining empirical evidence on counseling practices in community health centers helps formulate better operational standards (Wulandari & Pratiwi, 2019; Kusuma et al., 2020).

In addition to clinical aspects, managerial dimensions such as drug supply management, prescription management, and clinical records affect drug availability and the ability of health centers to provide adequate counseling. Irregular drug supplies often lead to drug substitution or treatment delays, which then complicate counseling efforts and ensure rational drug use. Evaluation of drug management in primary facilities shows the need for improvements in the supply chain, record keeping, and prescription audits to improve service quality. System-based interventions, such as the use of WHO indicators and prescription record audits, have been shown to help improve drug procurement and dispensing practices. Therefore, literature reviews should include studies on drug management to provide a comprehensive overview (Management Sciences for Health, 2018; Sari et al., 2018).

In many countries, especially in resource-constrained contexts, local policies and service models influence the extent to which clinical pharmacy services can be implemented in health centers. Cross-country studies show that countries with policies empowering pharmacists in primary care tend to report better prescription quality and counseling. Conversely, in locations with strict rules regarding the scope of practice or without specific remuneration mechanisms, pharmacist interventions are difficult to sustain. Therefore, a literature analysis should identify evidence related to policy aspects that facilitate or hinder the implementation of pharmaceutical care in PHC centers. The results of the review will be useful for policymakers in designing strategies to strengthen primary care (Al-Quteimat & Amer, 2020; OECD, 2020).

Educational and training interventions for pharmacy personnel and other health workers in PHCs are important aspects of improving counseling capacity and rational prescribing practices. Several intervention studies have reported increased adherence to treatment guidelines and improved counseling quality after evidence-based training and the implementation of clinical tools. However, evidence also shows that training without systemic support often results in short-

term effects that are not sustainable. Therefore, systematic reviews need to evaluate the effectiveness of combining educational interventions and organizational changes in services. This will help formulate sustainable implementation recommendations for the puskesmas context (Handayani et al., 2020; Nurhayati et al., 2022).

The use of service outcome indicators such as clinical outcomes, adverse drug events, patient satisfaction, and therapy adherence is an important way to assess the success of prescription and counseling services in puskesmas. Recent meta-analyses and comparative studies show that comprehensive pharmacy services can contribute to improvements in certain outcomes, such as chronic disease control and reduction of medication-related problems. However, the heterogeneity of study designs and outcome measurements challenges the generalization of findings. Therefore, literature reviews should note the variation in outcomes and quality of evidence to assess the level of confidence in recommendations. The synthesized results will guide future evaluation priorities in PHCs (Sabater-Hernández et al., 2022; Gelayee et al., 2021).

The issue of excessive antibiotic use in primary care is a clear example of how the quality of prescribing practices and counseling interact with broader public health issues. Systematic literature reviews show a high prevalence of antibiotic prescribing in cases where it is likely unnecessary, especially in low- and middle-income countries. Good counseling practices can help reduce patient demand for unnecessary antibiotics through education and explanation of the risks of resistance. Therefore, this study needs to review evidence of interventions targeting prescribing behavior and the role of counseling in changing patient demand patterns. Implications for community health centers include the need to integrate antimicrobial guidelines and risk communication strategies into clinical routines (Sulis et al., 2022; WHO, 2023).

In the context of Indonesia and several Southeast Asian countries, local research shows specific challenges such as variations in compliance with drug use indicators and the availability of pharmacists in rural health centers. Evaluations of rational drug use in several Indonesian health centers reveal areas for improvement, including prescription documentation and provision of information to patients. These local studies are important for understanding the operational context, patient culture, and resource constraints that are not always reflected in the global literature. Therefore, a good literature review should accommodate regional studies to make contextual and applicable recommendations. Synthesizing international and local evidence will strengthen the relevance of policies for health centers in Indonesia and similar countries (Puspitasari et al., 2022; Rahman et al., 2022).

Digital technologies—such as electronic medical records, pharmacy management systems, and mobile-based patient education tools—have the potential to improve prescription quality and counseling effectiveness in puskesmas. Several intervention studies have shown improvements in documentation, reductions in medication errors, and easier patient follow-up when technology is implemented with adequate training. However, technology implementation also poses challenges such as initial costs, training needs, and

interoperability issues. Therefore, this background section needs to highlight evidence on the benefits and limitations of technology in the context of primary care. A systematic assessment of technology interventions will help identify best practices that can be adapted in health centers (Aungst et al., 2020; Yuliana et al., 2023).

Patient experience and perceptions of prescription and counseling services also determine the success of pharmaceutical care interventions in PHCs. Research on patient experience finds that clear communication, patient involvement in treatment decisions, and adequate consultation time improve adherence and trust in service providers. A patient-centered approach to counseling has been shown to reduce anxiety related to medication use and improve understanding of dosage and side effects. Therefore, the literature review should include studies that measure patient experience as an important outcome. These findings will help design counseling models that are responsive to the needs of community health center patients (Lestari et al., 2021; Salgado et al., 2023).

To generate applicable policy recommendations, this literature review not only synthesizes evidence on the effectiveness of interventions but also identifies implementation barriers and mitigation strategies. Recent implementation research and policy studies offer insights into enablers such as regulatory support, financing, and interprofessional collaboration. In addition, cost-benefit analyses and feasibility studies help policymakers assess investment priorities in strengthening prescription and counseling services. Thus, a comprehensive review will provide practical recommendations for decision-makers at the community health center and health office levels. This reinforces the academic and policy relevance of the systematic review (OECD, 2019; Al-Tameemi et al., 2024).

Given the complexity of the issues—ranging from prescribing patterns, pharmacy workforce capacity, to patient perceptions—systematic research combining quantitative and qualitative evidence provides the most complete picture of prescription and counseling services in community health centers. Structured synthesis allows for the identification of research gaps, such as the need for longitudinal studies on clinical outcomes and policy implementation evaluations. By mapping evidence from various settings and contexts, this review presents a priority research agenda and policy recommendations. Finally, the evidence presented is expected to form the basis for improving practice, pharmacy education, and policy formulation to enhance the quality of pharmaceutical care in PHCs (Munn et al., 2018; Hidayat & Sari, 2024).

LITERATURE REVIEW

Prescription Services in the Context of Pharmaceutical Care

Prescription services are a fundamental component of pharmaceutical practice that plays a role in ensuring that medications prescribed to patients are not only available but also administered appropriately, safely, and effectively for the clinical needs of patients (Nylidia, et al 2018). Operationally, prescription services include receiving prescriptions, administrative checks, pharmaceutical and clinical evaluations, medication preparation, and dispensing medications to

patients accompanied by appropriate documentation. This concept has evolved from a mere distributive process to a clinical function oriented towards therapeutic outcomes and patient safety within the framework of comprehensive pharmaceutical care. In theory, prescription services aim to ensure that every stage in the medication cycle takes into account the aspects of quality, safety, rationality, and patient understanding of the treatment they receive.

The theory of prescription services is also rooted in the principle of rational drug use as defined by the World Health Organization (2023): patients must receive the right medication at the appropriate dosage and duration of use according to clinical needs, at an affordable price, and with adequate information so that patients can use the medication correctly. This concept serves as a theoretical framework for assessing the quality of prescription services, including parameters such as the completeness of prescription data, monitoring of drug interactions, and the timing and accuracy of dispensing. Another theoretical model shows that prescription services cannot be viewed separately from access to services, interprofessional coordination, and the ultimate goal of rational drug use as the main outcome of health services. Effective prescription services, according to this model, are not merely the dispensing of drugs but also therapeutic interactions that help achieve optimal treatment outcomes, including patient compliance and minimization of medication errors.

Conceptually, prescription services are a multidimensional, safety-oriented, and patient-centered professional process. Within the framework of pharmaceutical care, prescription services are understood as a series of integrated activities that begin with the receipt of a prescription and end with the patient's proper use of the medication. Each dimension has a specific role but interacts with others to ensure rational drug use. Failure in one dimension has the potential to reduce the overall quality of service and increase the risk of drug-related problems. Therefore, theoretical studies of prescription services generally cover four main domains, namely administrative, pharmaceutical, clinical, and therapeutic interaction (Simorangkir et al. 2025).

1. Administrative Dimension

The administrative dimension is the initial stage of prescription services, which serves to ensure the legality and validity of prescriptions before they are processed further. Theoretically, this dimension includes checking the completeness of patient identity, the identity and authority of the prescriber, the date of writing, and the clarity of medication instructions. Administrative checks are seen as an initial control mechanism to prevent systemic errors, such as the use of expired or invalid prescriptions. In the context of community health centers, the administrative dimension is also related to service accountability and continuous medical records. With thus, this dimension becomes an important foundation before conducting pharmaceutical and clinical assessments.

2. Pharmaceutical Dimension

The pharmaceutical dimension focuses on technical accuracy in the preparation and delivery of drugs according to pharmaceutical standards. Theoretically, this dimension includes validation of the suitability of dosage forms, dosage strength, physical and chemical stability of drugs, and compatibility between components, especially in compounded drugs. Errors in the pharmaceutical dimension can lead to reduced therapeutic effectiveness or the emergence of undesirable effects. In primary care facilities, this dimension also includes considerations of drug availability and compliance with the applicable formulary. Therefore, the pharmaceutical dimension emphasizes the importance of the technical competence of pharmacy personnel in ensuring the quality of drug products provided to patients.

3. Clinical Dimension

The clinical dimension is the core of the patient-oriented pharmaceutical care approach in prescription services. Theoretically, this dimension involves clinical screening to assess the suitability of drug therapy to the individual patient's condition, including age, physiological status, comorbidities, and medication history. Checking for potential drug interactions, duplication of therapy, contraindications, and dose adjustments are key components of this dimension. The clinical dimension views prescriptions not merely as written instructions, but as part of a clinical decision-making process that must be critically evaluated. Thus, prescription services serve as a key preventive mechanism against medication errors and drug-related problems.

4. Therapeutic Interaction Dimension

The therapeutic interaction dimension emphasizes professional communication between pharmacists and patients during medication dispensing. Theoretically, this dimension includes providing clear and accurate information about medication use, dosage, timing, side effects, and actions to take in case of adverse reactions. Therapeutic interaction is understood as a two-way communication process that allows patients to ask questions and clarify their understanding. This dimension plays an important role in increasing patient compliance, preventing medication errors, and strengthening the therapeutic relationship. In the context of primary care, therapeutic interaction bridges clinical decisions and medication use behavior by patients in the home environment.

The four theoretical dimensions of prescription services do not stand alone, but rather form a complementary process. The administrative dimension ensures legality, the pharmaceutical dimension ensures drug quality, the clinical dimension ensures therapeutic appropriateness, and the therapeutic interaction dimension ensures successful drug use by patients. The integration of these four dimensions is a key prerequisite for rational and safe drug use. Therefore, the theory of prescription services places the role of pharmacists as key actors in coordinating all these dimensions holistically. This approach strengthens the position of prescription services as a strategic component in improving the quality of primary health care.

Pharmaceutical Counseling Services

Pharmacy counseling services are an important component of pharmaceutical care that focuses on direct interaction between pharmaceutical personnel (e.g., pharmacists) and patients or their representatives to provide comprehensive information and education about medications. Counseling in pharmaceutical practice involves two-way communication aimed at helping patients understand how to use medications, side effects, drug interactions, and therapy-related risks so that medication use is safe, effective, rational, and appropriate for the patient's clinical needs. This activity is more than just providing information; counseling is oriented towards empowering patients to make the right decisions and increasing their involvement in managing their health. Counseling is known as an effective strategy in increasing medication adherence, reducing medication errors, and improving patients' quality of life through the optimization of therapeutic effects and reduction of the risk of treatment complications.

According to Khalf & Eshwika (2021), pharmaceutical counseling services have several theoretical and practical dimensions that form the basis for understanding and measuring the quality of counseling in the context of clinical pharmacy and primary health care services such as community health centers:

1. Drug Information Provision Dimension

This dimension includes the provision of complete information about drugs, such as indications, dosage, schedule of use, method of use, duration of therapy, possible side effects, and actions to be taken if adverse reactions occur. The information provided must be clear, accurate, and relevant to the patient's needs to prevent medication errors and improve patient understanding of their therapy.

2. Two-Way Communication Dimension

Counseling theory places communication as a two-way interaction process between pharmacists and patients, not just a one-way message delivery. Effective counseling requires active dialogue, active listening skills, clarification of patient understanding, and the use of language that is easily understood by patients or their representatives. Two-way interaction allows pharmacists to identify patients' concerns, myths, or barriers to medication use.

3. Patient Education and Empowerment Dimension

Pharmaceutical counseling aims to educate patients so that they become empowered individuals in managing their own health. This includes encouraging patients to understand the importance of adherence to therapy, recognizing signs of side effects that require follow-up, and the ability to make appropriate decisions regarding their therapy. Education in counseling emphasizes the provision of adaptive information according to the clinical context and patient needs.

4. Patient Safety Dimension

This dimension describes counseling as a layer of prevention for patient safety risks, including the prevention of medication errors, identification of potential drug interactions, and advice on specific risks (e.g., side effects or contraindications). Counseling directly contributes to medication safety because patients who understand the correct medication protocols are less likely to experience complications and negative effects from medications.

5. Therapeutic Relationship Dimension

Beyond knowledge, effective counseling builds a therapeutic relationship between pharmacists and patients. This relationship encompasses trust, empathy, and a sense of being valued, which helps patients feel comfortable asking questions and sharing concerns about the medications they are taking. A strong therapeutic relationship improves adherence to treatment recommendations and patient engagement in long-term care

METHODOLOGY

This study employed a systematic literature review design to synthesize empirical evidence on pharmaceutical care in primary health centers, with a specific focus on prescription services and patient counseling. The review protocol was developed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure transparency and methodological rigor. Literature searches were conducted in international databases, including Scopus, PubMed/MEDLINE, Embase, and Web of Science, as well as national Indonesian databases such as Garuda and SINTA to capture relevant local evidence. The search strategy combined controlled vocabulary and free-text terms related to pharmaceutical care, primary health centers/puskesmas, prescription services, and patient counseling, with publication years limited to 2017–2025. Following database searching and removal of duplicates, titles and abstracts were screened independently by two reviewers, followed by full-text assessment based on predefined inclusion and exclusion criteria, resulting in the inclusion of 20 studies, consisting of 10 Scopus-indexed journals and 10 SINTA-indexed journals.

Data extraction was performed using a standardized form to collect information on study characteristics (author, year, country), study design, sample size, intervention or service characteristics, outcome measures, and key findings related to prescription quality and patient counseling. The methodological quality and risk of bias of the included studies were assessed using appropriate appraisal tools according to study design, including the Joanna Briggs Institute (JBI) critical appraisal checklists for observational and qualitative studies. Given the heterogeneity in study designs, outcomes, and measurement methods, a narrative synthesis approach was applied, with findings organized thematically into prescription practices, counseling effectiveness, pharmacist roles, patient-related outcomes, and implementation barriers. The strength of evidence was interpreted by considering study quality, consistency of findings, and contextual relevance to primary health care settings,

particularly puskesmas. This methodological approach enabled a comprehensive and context-sensitive synthesis of global and national evidence to inform policy and practice improvements in pharmaceutical care at the primary health care level.

RESEARCH RESULT

To systematically synthesize the evidence on pharmaceutical care in primary health centers, particularly in relation to prescription services and patient counseling, a structured data extraction process was conducted for the studies included in this review. This process aimed to capture key methodological and contextual characteristics of each study, including author and year of publication, country of origin, study design, and principal findings relevant to prescription review and counseling practices. The extracted data enabled a comprehensive comparison of evidence derived from international (Scopus-indexed) and national (SINTA-indexed) journals, highlighting similarities and differences in implementation, challenges, and outcomes of pharmaceutical care across diverse primary health care settings. Furthermore, this approach facilitated thematic synthesis of findings related to administrative, pharmaceutical, clinical, and therapeutic interaction dimensions of prescription services. The detailed characteristics and key findings of the selected studies are presented in the following table.

Table 1. Data Extraction of Selected Studies

Author (Year)	Country	Desain	Key Findings
Alshammari et al. (2018)	Saudi Arabia	Cross-sectional	Prescription services in primary care showed adequate dispensing accuracy, but patient counseling was inconsistent and often limited to dosage instructions only.
Showande & Laniyan (2019)	Nigeria	Observational study	Pharmacist-led counseling significantly improved patients' understanding of medication use and reduced potential drug-related problems.
Mekonnen et al. (2020)	Ethiopia	Mixed-methods	Administrative and pharmaceutical screening of prescriptions was generally adequate, but clinical review and

			counseling components were underdeveloped.
Al-Quteimat & Amer (2020)	Jordan	Cross-sectional	High workload and limited staffing were major barriers to comprehensive prescription review and counseling in primary health centers.
Kaae et al. (2021)	Denmark	Qualitative study	Integration of pharmaceutical care into primary health services strengthened medication safety through improved prescription assessment and patient counseling.
Gelayee et al. (2021)	Ethiopia	Descriptive study	More than half of prescriptions contained at least one drug-related problem that could be mitigated through effective counseling.
Sabater-Hernández et al. (2022)	Spain	Systematic review	Patient counseling was consistently associated with improved adherence and therapeutic outcomes in primary care settings.
Puspitasari et al. (2022)	Indonesia	Cross-sectional	Clinical screening of prescriptions by pharmacists reduced medication errors, but counseling quality varied significantly among facilities.
Salgado et al. (2023)	Brazil	Quasi-experimental	Structured counseling interventions improved patient satisfaction and medication adherence in primary health centers.
Al-Tameemi et al. (2024)	Iraq	Cross-sectional	Prescription services were dominated by dispensing activities, while counseling was limited due to time

			constraints and lack of private counseling areas.
Sari et al. (2018)	Indonesia	Descriptive study	Administrative screening of prescriptions at puskesmas was generally compliant with standards, but clinical evaluation was not optimal.
Wulandari & Pratiwi (2019)	Indonesia	Cross-sectional	Patient counseling was mostly informational and lacked interactive communication to assess patient understanding.
Handayani et al. (2020)	Indonesia	Observational study	Pharmacist involvement in prescription services reduced dispensing errors but counseling time remained limited.
Kusuma et al. (2020)	Indonesia	Qualitative study	Patients perceived counseling as important, but reported receiving minimal explanations about side effects and drug interactions.
Lestari et al. (2021)	Indonesia	Cross-sectional	Counseling services positively influenced patient adherence, especially in chronic disease management.
Pratama & Dewi (2021)	Indonesia	Descriptive study	High patient volume in puskesmas constrained pharmacists' ability to conduct comprehensive prescription review and counseling.
Nurhayati et al. (2022)	Indonesia	Mixed-methods	Lack of standardized counseling guidelines led to variability in counseling quality among primary health centers.
Rahman et al. (2022)	Indonesia	Cross-sectional	Prescription services emphasized dispensing accuracy, while

			therapeutic communication with patients was often neglected.
Yuliana et al. (2023)	Indonesia	Observational study	Implementation of counseling checklists improved consistency of information delivered to patients.
Hidayat & Sari (2024)	Indonesia	Quasi-experimental	Structured pharmaceutical counseling significantly improved patient knowledge and correct medication use at puskesmas.

DISCUSSION

Prescription services at the community health center level often still focus on administrative aspects and physical dispensing of drugs, so that the clinical function of pharmacists – as identifiers and solvers of drug-related problems – is not yet optimal; this condition minimizes the contribution of pharmacy to long-term therapeutic outcomes in the primary population. Product-oriented dispensing tends to result in workflows that emphasize therapeutic interactions with patients and neglect comprehensive clinical reviews. The transformation to patient-centered pharmaceutical care requires structural shifts, not just individual training, because managerial and policy aspects determine the scope of clinical practice. Therefore, change strategies must include task reorganization, dedicated time allocation for clinical reviews, and performance indicators that measure outcomes, not just dispensing volume. These implications align with the global urgency to prioritize medication safety at all levels of healthcare (Donaldson, 2017).

Empirical evidence shows that when pharmacists are given authority and adequate access to clinical information, their ability to detect dosing errors, drug interactions, and duplication of therapy increases significantly – this effect is seen in a reduction in potential therapy problems and improved patient safety. However, the effectiveness of clinical reviews is greatly influenced by the availability of electronic medical records or information systems that allow quick access to patient medication histories; without these, screening becomes fragmented and reliant on patient memory. Therefore, technical interventions must go hand-in-hand with workflow improvements so that clinical reviews can become a value-added activity in community health centers. Such an integrative approach has been reported to reduce the incidence of harmful prescribing in primary care settings (Chambers et al., 2024).

Structured patient counseling has been shown to improve patient understanding, compliance, and satisfaction with services – but the quality of

counseling in the field varies greatly, from minimal explanations to comprehensive educational sessions that include monitoring and follow-up. This variation indicates the absence of minimum standards for counseling practices that are easy to implement in community health centers, making it difficult to achieve consistency in service delivery. Standardization—such as a core counseling checklist—can reduce practice variation and facilitate quality evaluation; this approach is also cost-effective for facilities with limited resources. Therefore, adopting simple tools and focused brief training can be a first step toward rapidly improving counseling quality (Tadesse et al., 2023).

Structural barriers—such as a shortage of pharmacists, high patient loads, lack of private space for consultations, and time constraints—are key determinants of the low frequency of meaningful therapeutic interactions in many health centers; these issues are systemic and require organizational intervention. Partial solutions such as task rotation or special consultation schedules can help, but without policies to strengthen human resources and clinical service remuneration, change will be difficult to sustain. Implementation experiences in several countries show that combining policy packages—role descriptions, remuneration, and workflow arrangements—increases the time allocated for pharmaceutical consultations. Therefore, interventions that only target individuals are insufficient—structural changes that support clinical practice are needed (FIP, 2025).

From a patient safety perspective, prescription services and counseling work as complementary layers of defense: pharmaceutical and clinical reviews prevent prescribing errors, while counseling prevents post-dispensing user errors. Many impactful errors occur during the home use phase, so the overall effectiveness of the medication cycle must be measured not only by dispensing accuracy but also by patient outcomes after counseling. Comprehensive measurements (adverse events, compliance, readmissions or repeat visits) are needed to assess the added value of pharmaceutical interventions at the primary level. An evaluation design that combines process and clinical outcomes will provide strong evidence for policymakers (WHO, 2024).

The gap between national guidelines and field practice highlights the need to adapt policies to the local context; guidelines that are too idealistic without considering local logistical capacity and human resources risk not being adopted. Implementation studies suggest that successful guidelines are those developed in collaboration with local stakeholders, include phased implementation options, and are accompanied by support packages (training, practical tools, monitoring). Therefore, strategies to strengthen pharmaceutical care must involve co-designing policies with community health centers, health offices, and professional associations. Such adaptation improves operational feasibility while increasing implementers' commitment (Paolinelli et al., 2025).

Continuing education improves pharmacists' clinical competencies—particularly their ability to assess pharmacotherapy risks and provide effective counseling—but the impact is greater when accompanied by mentoring and workflow changes that enable the application of these competencies. Training models that combine clinical theory with case-based practice, supervisory

feedback, and performance audits show more lasting results than one-time short training sessions. Therefore, effective HR development programs must include post-training evaluation and on-the-job coaching components. Without a mechanism for transfer to practice, training will lose its effectiveness in the medium term (Mesquita et al., 2019).

Interprofessional collaboration is an important enabler: when pharmacists are integrated into primary teams and structured clinical communication is in place (e.g., routine case meetings, documentation of recommendations), pharmaceutical recommendations are more frequently implemented and patient outcomes improve. Professional cultural barriers and authority limitations are often obstacles, so interventions must include the establishment of collaborative SOPs and an understanding of interprofessional roles. Experience from primary settings in Europe and the Middle East shows that formal collaboration structures increase the clinical impact of pharmaceutical interventions. Therefore, establishing local collaborative forums is a practical step that supports the implementation of pharmacists' clinical recommendations (Sallom et al., 2023).

Information technology (electronic medical records, decision support tools, e-prescribing) helps reduce pharmacists' cognitive load and speeds up the identification of potential drug interactions and prescribing errors, but the adoption of technology in community health centers is often hampered by cost and interoperability issues. Piloting low-cost solutions—such as digital checklists, simple mobile apps for interaction checks, or e-form modules—shows significant benefits in the screening process without requiring large investments. Therefore, technology strategies for community health centers should be pragmatic, gradual, and accompanied by user training. Local cost-benefit analysis should form the basis for technology investment decisions (Tamblyn et al., 2019).

Simple but structured interventions—such as prescription screening checklists, counseling templates, and decision flows—have been shown to improve practice consistency and reduce variation between providers without requiring significant resources. Checklists also facilitate service quality monitoring and provide evaluation tools that can be used by health center quality supervisors. These low-cost intervention packages are particularly suitable for health centers with limited human resources and facilities. Therefore, advocating for the implementation of simple practice tool packages should be a priority in primary pharmacy service strengthening strategies (Showande, 2022).

Patient involvement as active partners in therapy increases the effectiveness of counseling: a patient-centered approach that asks about patient preferences, expectations, and barriers tends to result in better compliance than a paternalistic approach. This requires adaptive communication skills from pharmacists, including the use of simplified language, visual materials, and message repetition. Communication strategies that are sensitive to literacy levels and cultural contexts improve patient understanding and reduce the risk of misuse. Therefore, communication training is a crucial component of counseling quality improvement programs (Nutbeam, 2018).

Preliminary evidence on the economic effects of strengthening pharmaceutical care in primary care shows potential for systemic savings—through reduced repeat visits, treatment complications, and hospitalizations—but study results are heterogeneous and context-specific. Cost-benefit analyses that convince local policymakers are still rare, so the economic argument for funding pharmacist clinical services is less compelling in some regions. Standardized, locally data-driven economic research would strengthen the case for budget allocation for the clinical role of pharmacists. Therefore, incorporating economic outcomes into the evaluation of pilot interventions is essential (Elliott et al., 2021).

From a policy perspective, a number of countries that have successfully integrated the clinical role of pharmacists in primary care emphasize the importance of a combination of regulation (scope of practice), service financing, and nationally recognized quality indicators. Without guaranteed remuneration or incentives for clinical services, role changes tend to be hampered by work volume pressures. Furthermore, incorporating prescription and counseling quality indicators into accreditation and reporting mechanisms can encourage the adoption of new practices. Therefore, policy reform must be simultaneous: changing regulations, creating funding streams, and establishing relevant performance metrics (Anderson et al., 2019).

Research methodologies in the field show limitations: the majority of studies are cross-sectional or descriptive, limiting causal inferences about long-term clinical outcomes; RCT or cluster-RCT studies in primary settings are still relatively few. To strengthen the evidence, future research should adopt experimental or quasi-experimental designs that measure clinical outcomes, adherence, adverse events, and economic effects simultaneously. Standardization of outcomes and measurement tools will also enable more valid meta-analytic synthesis. Investment in implementation science research methodologies will accelerate the translation of findings into policy (Paulinelli et al., 2025).

This evidence synthesis confirms that strengthening the integration of clinical prescription screening and structured counseling in community health centers has the potential to improve patient safety, adherence, and service efficiency—but successful implementation depends on systemic changes: policy support, human resource capacity, appropriate technology, and local economic evidence. A phased approach combining simple practice tools, ongoing training, interprofessional collaboration, and economics-based pilot studies is a realistic strategy for improving pharmaceutical care in primary care. A synchronized research and policy agenda will accelerate the transformation of dispensing practices into clinical services that are truly patient-outcome oriented. With multisectoral commitment, community health centers can become sites for effective and sustainable pharmaceutical care implementation (Helgesen et al., 2024).

CONCLUSIONS AND RECOMMENDATIONS

Prescription services and counseling are key components in the implementation of pharmaceutical care in community health centers, which play an important role in ensuring patient safety, rational drug use, and improved therapeutic outcomes. Although most community health centers have implemented the administrative and pharmaceutical aspects of prescription services quite well, the clinical and patient counseling dimensions are still not optimal due to limitations in pharmacist staffing, high workloads, lack of supporting infrastructure, and weak integration of the pharmacy role in the primary care team. Study findings indicate that pharmacist-led interventions—such as clinical prescription screening, medication review, and structured counseling—consistently contribute to a reduction in medication-related problems, increased therapy adherence, and improved patient understanding and satisfaction. However, the heterogeneity of study designs and outcome indicators used indicates the need for caution in generalizing results across contexts. Therefore, strengthening policies, increasing the capacity of pharmaceutical human resources, standardizing counseling practices, and utilizing information technology are important strategies for optimizing pharmaceutical services in community health centers, while also opening up opportunities for further research on the long-term impact of pharmaceutical care in primary health care.

Improving the quality of prescription and counseling services in PHCs needs to focus on strengthening the role of pharmacists through the addition and equitable distribution of pharmaceutical personnel, the implementation of clinical prescription screening standards and structured counseling, as well as adequate policy and infrastructure support. In addition, the integration of information technology and continuing education programs are important for improving service consistency and medication safety. Further research with a longitudinal design and implementation approach is also recommended to assess the long-term impact of pharmaceutical care in primary health care services.

ADVANCED RESEARCH

Advanced research is recommended to develop and test an integrated pharmaceutical care model in community health centers that combines clinical prescription screening, therapeutic communication-based patient counseling, and digital technology support. Studies with longitudinal designs and implementation research are needed to evaluate the long-term impact of these interventions on clinical outcomes, medication safety, service efficiency, and cost-effectiveness in the context of primary health care.

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