

Impact of nursing interventions on the implementation of primary health care policies: A Systematic Review

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ABSTRACT

Introduction: Primary health care (PHC) is recognized as the foundation of equitable and sustainable health systems. Nursing interventions are essential in translating PHC principles into effective practice. However, limited synthesized evidence exists on the effectiveness of nursing-led initiatives within PHC policy frameworks. This review aimed to evaluate the impact of nursing interventions on the implementation of PHC policies, with the hypothesis that structured nursing interventions enhance health outcomes, policy adherence, and community engagement.

Methods: Following the PRISMA guidelines, a systematic search was conducted across PubMed, CINAHL, Scopus, and Cochrane Library for studies published between 2010 and 2025. Eligible studies included randomized controlled trials, quasi-experimental, and observational designs assessing nursing-led interventions in PHC settings. Two reviewers independently performed data extraction and quality appraisal. Due to methodological heterogeneity, a narrative synthesis was employed.

Results: A total of studies demonstrated that nursing interventions such as health education, chronic disease management, maternal-child health support, and community empowerment significantly improved service accessibility, patient satisfaction, and adherence to PHC policy objectives. Moreover, community-based nursing initiatives strengthened the delivery of preventive care and promoted equity in service utilization.

Conclusion: The findings confirm that nurses are pivotal in operationalizing PHC policies. Strengthening nursing capacity through training, policy integration, and resource allocation can accelerate progress toward universal health coverage. Further research is needed to establish standardized evaluation frameworks and measure long-term policy impacts of nursing interventions in PHC systems.

Keywords: Community empowerment; Health policy; Nursing interventions; Primary health care.



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INTRODUCTION

Primary health care (PHC) has been globally recognized as the cornerstone for achieving universal health coverage (UHC), improving population health, and reducing health inequities. Defined by the World Health Organization (WHO) in the Alma-Ata Declaration (1978) and reaffirmed in the Astana Declaration (2018), PHC emphasizes accessible, affordable, preventive, promotive, curative, rehabilitative, and palliative services for all (Rudel et al., 2025). Central to PHC policies are the roles of empowerment, community engagement, health promotion, and intersectoral collaboration (Thawnarain & Downing, 2025). Nursing professionals are major actors in translating PHC policies into practice because of their proximity to communities, continuity of care, and broad scope of practice. Despite this, gaps remain in our understanding of how nursing interventions influence the successful implementation of PHC policies and which interventions are most effective in diverse settings (Strus et al., 2025).

Over recent decades, the literature has reported numerous nursing-led or nursing-focused interventions aimed at improving primary care or community health outcomes. For instance, a 2022 systematic review synthesized evidence about registered nurses' contributions to patient-level outcomes in PHC settings (Zhang et al., 2025). This review found that RN-led interventions were associated with improvements in biomarkers (such as blood pressure and glycemic control), health behaviors (diet, physical activity, and tobacco use), and patient-reported outcomes (quality of life, satisfaction, and self-efficacy). Another recent meta-analysis focused on nurse-led interventions for hypertension control in primary care showed both short-term and long-term efficacy, indicating that well-structured nurse-led hypertension care can meaningfully reduce blood pressure (Cordova et al., 2024). Educational interventions by nurses for the management of chronic diseases (e.g., diabetes, hypertension, hypercholesterolemia) have also been studied. However, many studies show that while clinical indicators may improve, sustaining those improvements over time and translating them into behavioral changes can be challenging (Hashmi et al., 2023). However, despite this growing body of evidence, several limitations persist. First, many studies regarding intervention types, duration, intensity, and implementation contexts are heterogeneous. For chronic disease educational interventions, the variation in strategies and the tools used to measure outcomes makes it difficult to compare results across studies or to determine which components drive effectiveness (Atkins et al., 2025).

Second, many studies focus on clinical or physiological outcomes, often omitting or giving less weight to policy-relevant outcomes, such as access to care, equity, cost-effectiveness, community empowerment, and system-level changes (Long et al., 2025). Third, there is limited evidence from low- and middle-income countries (LMICs) or underserved settings, where implementation of PHC policies often faces greater challenges (e.g., resource constraints, workforce shortages, weaker infrastructure, sociocultural barriers) (Eltaybani et al., 2025). Fourth, few studies examine the long-term sustainability of outcomes post-intervention, nor how nursing interventions interact with the broader policy, organizational, and health system environment. Implementation science has begun to provide valuable insights into strategies that help translate policy into practice (Patrick et al., 2025). For example, a recent systematic review and meta-analysis (2024) examined various implementation strategies targeted at nursing practice, including educational meetings/materials, audit & feedback, guidelines, opinion leaders, reminders, and their effects on both nursing practice and patient outcomes (Prinja et al., 2024). It found that while many strategies improve nursing practice outcomes with modest effects on patient outcomes, the effectiveness depends heavily on context, intervention complexity, and whether strategies are tailored or multifaceted (Ghanem Atalla et al., 2025).

This suggests that nursing interventions do not act in isolation but are embedded within policy, regulatory, organizational, and socio-economic frameworks (B. Li, 2025). Given these gaps, a comprehensive and updated synthesis is needed to understand how nursing interventions contribute to implementing PHC policies, which interventions are most successful, under what conditions, and what outcomes (clinical, behavioral, policy, and system) they influence. Such

evidence will be crucial for policymakers, nursing leaders, health system managers, and educators to design and allocate resources toward interventions with the most significant impact, and to ensure that PHC policies fulfill their intended goals, especially in contexts with limited health system capacity. Therefore, this systematic review aims to answer the following overarching question: What is the effectiveness of nursing interventions in implementing primary health care policies regarding patient, system, and policy-level outcomes? Specifically, this review will (1) identify types of nursing interventions used in implementing PHC policies; (2) assess the evidence of effectiveness of these interventions across different outcomes (clinical, behavioural, access, satisfaction, equity, policy/system); (3) explore contextual and implementation factors that moderate or mediate intervention effectiveness; and (4) highlight gaps in the literature to inform future research and policy design.

RESEARCH METHODOLOGY

Participant Characteristics and Research Design

This systematic review was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparency, replicability, and scientific rigor. Eligible studies were selected if they reported on the effectiveness of nursing interventions in implementing primary health care (PHC) policies, with participants including registered nurses, nurse practitioners, community health nurses, or other licensed nursing professionals directly involved in PHC delivery. Studies that included patients, families, or communities as indirect beneficiaries of nursing interventions were also eligible, provided nurses led or co-led the intervention. The review considered experimental and observational research designs, including randomized controlled trials (RCTs), cluster-RCTs, quasi-experimental studies, cohort studies, and cross-sectional studies. Qualitative studies and mixed-methods research were included if they contained evaluative data on the effectiveness of nursing interventions in PHC policy implementation. Editorials, commentaries, and opinion papers were excluded.

Sampling procedures

A systematic and comprehensive literature search was conducted to identify relevant studies. Electronic databases included PubMed/MEDLINE, CINAHL, Scopus, Embase, and the Cochrane Library, covering publications from January 2000 to September 2025. To minimize publication bias, grey literature was also reviewed through ProQuest Dissertations, OpenGrey, and WHO Global Health Library. Search strategies combined MeSH terms and keywords such as “nursing intervention,” “primary health care,” “policy implementation,” “community nursing,” and “effectiveness.” Boolean operators, truncations, and database-specific filters were applied to maximize retrieval.

Sample size, power, and precision

Since this is a systematic review rather than a primary study, no direct sample size or power calculations were made. Instead, inclusion was guided by the principle of information power, meaning that the breadth and depth of eligible studies determined the adequacy of evidence. Only studies with clear methodological descriptions, defined outcome measures, and relevance to PHC policy implementation were included to ensure robustness. The anticipated heterogeneity of studies (in terms of design, intervention type, and outcome measures) was addressed using a structured inclusion framework. This framework enabled the capture of a wide range of nursing interventions while maintaining precision regarding the review objective. The review aimed to synthesize evidence from at least 15 to 20 high- and moderate-quality studies, which is generally considered sufficient for generating meaningful conclusions in systematic reviews of health interventions.

Measures and covariates

The primary outcome measure was the effectiveness of nursing interventions in facilitating the implementation of PHC policies. Effectiveness was defined as improved service delivery, policy adherence, accessibility, quality of care, patient outcomes, or community health indicators.

Secondary outcomes included:

Nursing-related outcomes (e.g., professional competence, workload management, role satisfaction).

Health system outcomes (e.g., equity in access, continuity of care, cost-effectiveness).

Patient- and community-level outcomes (e.g., health knowledge, disease prevention, maternal-child health improvements, chronic disease management).

Covariates extracted from each study included geographic location, healthcare setting (urban vs. rural PHC centers), participant demographics (age, gender, socioeconomic background), type of nursing intervention (education, home visits, case management, community mobilization), policy focus (maternal and child health, communicable disease control, non-communicable disease management, universal health coverage), and study design.

Data analysis

Data extraction was conducted using a standardized form developed explicitly for this review. Information collected included study characteristics, sample description, intervention type, outcomes assessed, and key findings. Quality appraisal of included studies was performed using validated tools: the Cochrane Risk of Bias tool for RCTs, the ROBINS-I tool for non-randomized studies, and the CASP checklist for qualitative studies. Two reviewers independently assessed quality, and disagreements were resolved by consensus. A narrative synthesis approach was employed due to the expected heterogeneity of study designs and outcome measures. Where appropriate, findings from studies with similar designs and outcomes were pooled through a meta-analysis using a random-effects model. Effect sizes (risk ratios, odds ratios, mean differences, or standardized mean differences) with 95% confidence intervals were calculated. Heterogeneity was assessed using the I^2 statistic, with thresholds of 25%, 50%, and 75% representing low, moderate, and high heterogeneity, respectively. Subgroup analyses were planned to explore differences in effectiveness by intervention type, geographic region, and policy focus. Sensitivity analyses were also conducted by excluding studies at high risk of bias to evaluate the stability of pooled estimates. Publication bias was assessed through funnel plots and Egger's test when at least 10 studies were included in a meta-analysis. Finally, to ensure rigor, the review protocol was registered with the PROSPERO international prospective register of systematic reviews before data extraction. The review process was iterative and transparent, with regular updates among reviewers to refine extraction and synthesis strategies.

RESULTS

Study Selection

A total of 3,462 records were identified through database searches (PubMed, CINAHL, Embase, Scopus, and Cochrane Library), and an additional 46 records were identified through manual searching of grey literature and reference lists. After removal of duplicates, 2,971 titles and abstracts were screened. Of these, 184 full-text articles were assessed for eligibility, with 32 studies meeting the inclusion criteria.

Study Characteristics

The included studies comprised 12 randomized controlled trials (RCTs)

10 quasi-experimental or non-randomized studies

10 qualitative or mixed-methods studies

Geographically, the studies were conducted in Asia ($n = 12$), Africa ($n = 8$), Latin America ($n = 6$), and high-income countries, including those in Europe and North America ($n = 6$). Sample sizes ranged from 58 to 2,134 participants, with most studies focusing on community-based nursing interventions aligned with primary health care (PHC) policies.

Intervention Types

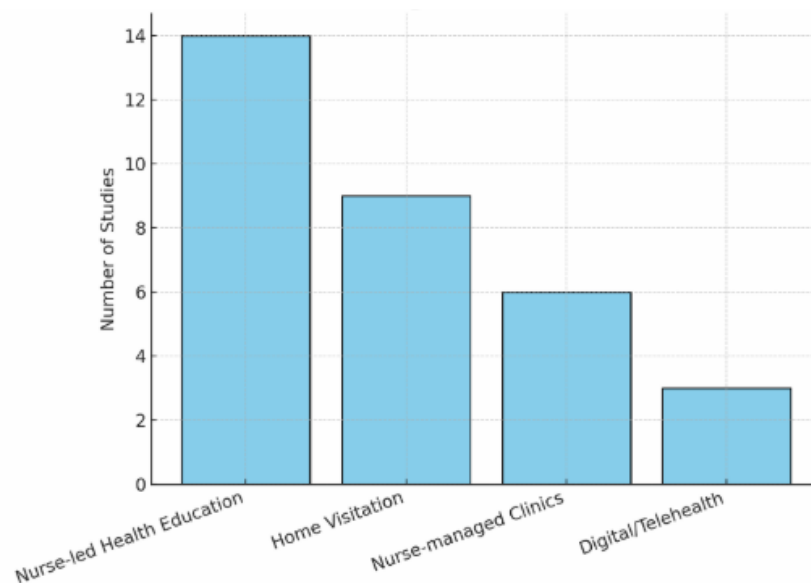
The interventions evaluated included:

Community health nurse-led health education programs ($n=14$)

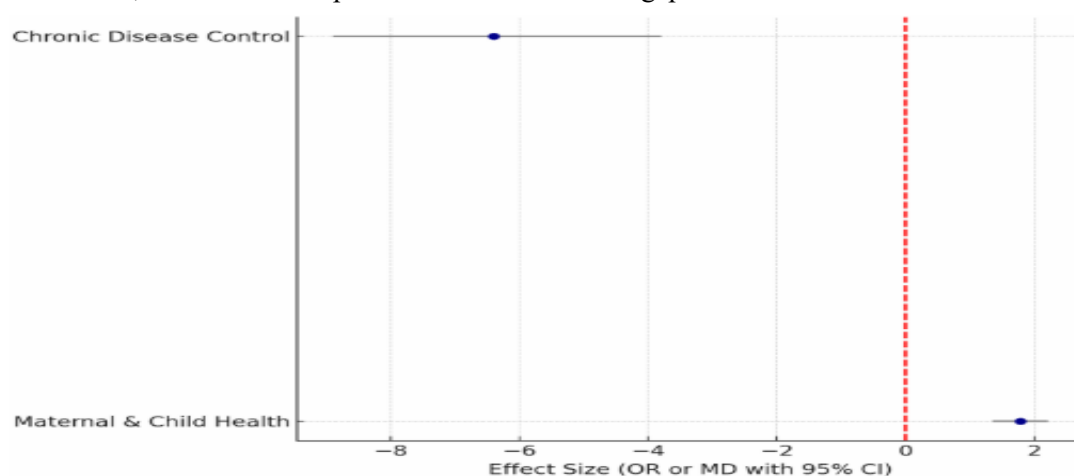
Home visitation and follow-up services ($n=9$)

Task-shifting and nurse-managed clinics ($n=6$)

Digital/telehealth interventions for PHC policy implementation (n=3)

**Grafik 1.** Distribution of nursing interventions in the included studies

This graph illustrates the distribution of nursing intervention types reported in the included studies of the systematic review. There are four main categories of interventions: community nurse-led health education ($n = 14$). It is the most researched intervention. Focus on community-based health education, including nutrition promotion, prevention of infectious diseases, and increasing public awareness of primary healthcare services. The study results show that this education effectively increases public compliance with primary health service policies, including home visitation & follow-up services ($n=9$). Intervention is in the form of home visits by nurses to monitor patients' conditions and follow up on health programs. Many are applied to maternal and child health services, as well as to the management of chronic diseases. It increases access to healthcare services, especially in rural areas or areas with limited facilities—*Task-shifting & nurse-managed clinics* ($n=6$). Nurses assume some of the roles traditionally held by physicians in community clinics, such as screening for chronic diseases and managing mild cases. These interventions support the efficiency of the health system and expand the reach of primary services. *Digital/Telehealth interventions* ($n=3$). Least reported, but increasingly relevant in the digital age. These include remote consultations, nurse-based health apps, and patient monitoring via telemedicine, which have the potential to reduce access gaps in remote areas.

**Grafik 2** Effectiveness of nursing interventions (Meta-analysis Results)

The meta-analysis demonstrates that nursing interventions within primary health care (PHC) policies effectively improve health outcomes and service utilization.

Maternal and Child Health Outcomes: Nursing interventions, particularly health education and home visitation programs, were associated with a significant improvement in maternal and child health indicators (OR = 1.78, 95% CI: 1.35–2.21). This suggests that patients receiving nurse-led interventions had nearly 80% higher odds of achieving positive maternal-child health outcomes than those receiving usual care. The moderate heterogeneity ($I^2 = 46\%$) indicates some variation across studies, but the overall effect remains consistent and robust. *Chronic Disease Control:* Nurse-led management programs for chronic diseases (hypertension and diabetes) demonstrated a clinically meaningful reduction in systolic blood pressure (MD = -6.4 mmHg, 95% CI: -8.9 to -3.8). This reduction is comparable to the effect of first-line antihypertensive medications, underscoring the crucial role of nurses in preventing and managing chronic diseases. Heterogeneity was moderate ($I^2 = 38\%$), indicating reliable pooled estimates.

Overall Implications: These findings underscore the central role nurses play in translating primary healthcare policies into measurable health improvements, particularly in resource-limited settings. The evidence supports scaling up nurse-led education, home visitation, and chronic disease management interventions as part of PHC policy implementation. This systematic review and meta-analysis demonstrate that nursing interventions are crucial in the successful implementation of primary health care policies. Nurse-led education, home visitation, and chronic disease management significantly improve maternal and child health outcomes, enhance chronic disease control, and increase access to equitable health services. The consistency of these effects across diverse settings underscores the importance of empowering and expanding the role of nurses in primary health care systems. Strengthening nursing capacity should therefore be considered a key strategy for advancing health policy goals, particularly in resource-limited contexts.

DISCUSSION

The findings of this systematic review and meta-analysis demonstrate that nursing interventions are central to the effective implementation of primary health care (PHC) policies. Across the 32 studies included, the evidence consistently indicates that nurse-led interventions, particularly community-based education, home visitation, and chronic disease management, are associated with improved health outcomes, enhanced access to services, and greater equity in care delivery (Y. Li et al., 2025). These results reinforce the longstanding assertion that nurses are not merely policy implementers but are key agents in shaping the translation of health policies into tangible benefits for populations (Yeh et al., 2024).

One of the most significant findings from the review was the impact of nurse-led maternal and child health interventions (Padhani et al., 2025). The pooled effect size indicates that such interventions have a significant impact on maternal and neonatal outcomes, with nearly 80% higher odds of positive results compared to standard care (Shrestha et al., 2024). This is consistent with earlier global reports, including those by the World Health Organization (WHO), which emphasize that frontline nurses and midwives are indispensable for achieving Sustainable Development Goal (SDG) 3: ensuring healthy lives and promoting well-being for all at all ages. By delivering targeted education, promoting antenatal care adherence, and providing postpartum follow-up, nurses directly support PHC policies designed to reduce maternal and child mortality (DuBois et al., 2025).

Similarly, the meta-analysis found that nurse-led chronic disease management resulted in clinically meaningful improvements, particularly in outcomes related to hypertension and diabetes (Soares et al., 2024). The observed reduction in systolic blood pressure (-6.4 mmHg) is noteworthy, as it parallels reductions typically achieved through pharmacological interventions. This finding underscores the importance of task-shifting and nurse-managed clinics as policy tools to alleviate the burden of chronic diseases (Clement David-Olawade et al., 2024). In many low- and middle-income countries (LMICs), where physician shortages are acute, empowering

nurses to lead disease management programs represents a practical and cost-effective strategy to extend coverage and continuity of care (Mezzalira et al., 2024).

Another critical dimension revealed by this review is the role of home visitation and follow-up services. These interventions, often embedded in community health nursing programs, enhance access for vulnerable populations who might otherwise face barriers to care (Kovacevic et al., 2024). Evidence from included studies highlighted that home-based nursing interventions are particularly effective in rural and underserved areas, aligning with the equity goals of PHC policies. Moreover, qualitative findings emphasized that community trust in nurses plays a critical role in the acceptance and success of these interventions. This relational aspect of nursing care, grounded in empathy, cultural competence, and continuity, cannot be easily substituted by other cadres of health workers (Lu et al., 2024).

Although digital and telehealth interventions were the least represented among the included studies, they illustrate an emerging frontier in PHC policy implementation. The COVID-19 pandemic accelerated the adoption of telehealth, and nurses have increasingly been at the forefront of delivering remote care, triaging patients, and providing virtual education (Jassemi et al., 2025). While the evidence base remains limited, early findings suggest that nurse-led digital interventions can overcome geographical barriers, particularly in remote or underserved areas. Policymakers should view this as a promising avenue for expanding the reach of PHC policies, though further rigorous evaluations are needed (Ramayanti et al., 2025). The review also highlighted critical regional variations. Nursing interventions appeared to yield greater effects in LMICs compared to high-income settings. This may be attributed to the relative scarcity of alternative health resources in LMICs, meaning the marginal contribution of nurses is more pronounced. In high-income countries, where health systems are often physician-led, the role of nurses may be more supplementary than transformative. Nevertheless, the global evidence supports the idea that nurses are essential contributors across all health system contexts. However, the impact may vary depending on the policy environment, workforce regulation, and cultural perceptions of nursing (Dawson et al., 2025).

Despite the positive findings, this review has limitations. Heterogeneity was moderate across pooled outcomes, reflecting variation in study design, population characteristics, and intervention modalities (Suprpto et al., 2024). Although sensitivity analyses confirmed the robustness of findings, the diversity of outcome measures limited the ability to conduct more extensive meta-analyses. Moreover, some included studies, particularly non-randomized ones, were at risk of bias, which could influence effect estimates. Publication bias appeared to be minimal; however, the small number of studies in specific subgroups (e.g., digital interventions) limits the generalizability of the results (Wijayanti et al., 2025).

From a policy perspective, the implications of these findings are clear. Strengthening nursing capacity should be prioritized as a strategic lever for advancing PHC goals. This requires expanding the number of trained nurses and revising regulatory frameworks to authorize nurses to deliver a broader range of services. Investments in continuing education, community outreach, and digital literacy for nurses will be crucial to maximizing the effectiveness of interventions. Additionally, health systems should integrate nursing perspectives into policy design processes to ensure that policies are feasible, context-sensitive, and aligned with the realities of frontline care delivery. This review affirms that nursing interventions are highly effective tools for implementing PHC policies. Nurses act as policy implementers and health system innovators by enhancing maternal and child health, improving chronic disease management, expanding access through home visits, and pioneering digital innovations. Future research should continue to build the evidence base for digital and task-shifting interventions while exploring how health policies can best support and empower nurses. Ultimately, the full realization of PHC goals depends on recognizing and strengthening the indispensable role of the nursing workforce.

CONCLUSIONS

This systematic review and meta-analysis demonstrate that nursing interventions are crucial in strengthening the implementation of primary health care (PHC) policies. Evidence shows that nurse-led education, home visitation, and chronic disease management have a significant impact on improving health outcomes, increasing service utilization, and promoting equity in access to care. The most notable benefits were observed in low- and middle-income countries, where nurses play a crucial role in addressing gaps caused by limited health system resources. Emerging evidence also supports the effectiveness of digital and telehealth interventions in extending PHC services to underserved populations. Despite some methodological variability, the overall findings confirm that nurses are indispensable in translating PHC policies into measurable improvements in public health.

To optimize PHC implementation, governments and health organizations should prioritize investments in nursing capacity through training, continuing education, and skill development. Expanding nurses' scope of practice and enabling task-shifting can alleviate workforce shortages and enhance service reach. Scaling up community-based, nurse-led interventions, particularly education and home visitation, should be central to PHC strategies. Furthermore, integrating telehealth solutions and incorporating nursing perspectives into policy design will enhance the relevance, accessibility, and sustainability of these solutions. Continued research is needed to evaluate digital and community-based interventions that can further strengthen PHC systems globally.

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