



NURSING INTERVENTIONS FOR THE PREVENTION AND MANAGEMENT OF NON-COMMUNICABLE DISEASES IN RURAL AREAS: A SCOPING REVIEW

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ABSTRACT

Non-communicable diseases (NCDs) are the leading global health issue, with a steadily increasing prevalence and the highest mortality rates worldwide. Nurses play a crucial role within communities; evidence-based nursing interventions warrant further exploration. This study aimed to identify, classify, and synthesize nursing interventions and their outcomes in preventing and managing non-communicable diseases in rural communities. A scoping review was conducted of studies published between 2015 and 2025, using the PubMed, ProQuest, and EBSCOhost databases. A total of 4,170 records were identified and screened using relevant keywords and Boolean operators, and articles meeting the inclusion criteria were analysed using Rayyan AI. Fourteen studies were included in the final review. These studies were conducted in rural areas across 11 countries, including Australia, the USA, Portugal, Spain, China, Canada, Africa, Rwanda, Iran, the Netherlands, and Turkey. The research designs included four qualitative studies, one cohort study, two quasi-experimental studies, three Randomized Controlled Trials (RCTs), two descriptive studies, and one anthropological study. Both independent and collaborative nursing interventions have been shown to improve behaviour change, promote healthy lifestyles, and increase knowledge among patients and communities regarding NCDs. It is expected that the nursing profession and policymakers can implement these nursing interventions in populations living in rural or underserved areas with limited access to healthcare facilities.

Keywords: community nurse; non-communicable diseases; nurse; nursing intervention; public health nurse

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INTRODUCTION

Non-communicable diseases (NCDs) represent a major and escalating global public health burden, with incidence and prevalence continuing to increase and positioning NCDs as the leading cause of mortality worldwide. According to the World Health Statistics 2019 report, which serves as a key monitoring framework for the Sustainable Development Goals (SDGs), four major NCD categories account for the majority of global deaths, namely cardiovascular and circulatory system disorders (44%), cancers (22%), chronic respiratory diseases (9%), and metabolic–endocrine disorders, particularly diabetes mellitus (4%) (WHO, 2019). These conditions disproportionately affect vulnerable populations, including those in rural and resource-limited settings, highlighting the critical need for effective nursing interventions in prevention, early detection, and long-term management of NCDs (WHO, 2019).

In Indonesia, according to the Kementrian Kesehatan Republik Indonesia (2019), the incidence of diseases has increased rapidly over the past decade, rising by 69.91% from 2007 to 2018. The progression of non-communicable diseases (NCDs) is chronic. It occurs over a long period, requiring integrated and sustainable management and the active involvement of various community and government sectors (Kementrian Kesehatan Republik Indonesia, 2019). Based on data from the 2023 Indonesian Health Survey, the leading causes of death among NCDs include asthma, cancer, diabetes mellitus, heart disease, hypertension, stroke, and chronic kidney disease. Major challenges in their management remain, particularly in dietary regulation and behavioural modification,

encompassing promotive, preventive, curative, rehabilitative, and palliative efforts to reduce complications and improve patients' quality of life (WHO, 2023).

The management of non-communicable diseases (NCDs) in Indonesia is carried out through the P2PTM program by the Ministry of Health, which emphasises risk factor education, early screening, the provision of adequate healthcare services, capacity building for human resources, and the strengthening of surveillance systems, as well as community partnership networks (Pandie & Handayani, 2023). The management of NCDs has also been implemented by the Social Security Agency for Health (BPJS Kesehatan) through the Chronic Disease Management Program, which aims to improve the quality of life of patients with chronic diseases, particularly at the Primary Health Care Centre, through regular health screenings and monitoring, disease education, medical treatment, provision of medications, and referral access. However, this program has not been optimally implemented, especially in rural areas, requiring evaluation and updated research efforts to provide valuable insights and recommendations (Rachmawati et al., 2019).

Nurses are an essential profession within the community (Florence, 2024). Managing non-communicable diseases (NCDs) in rural areas at primary health care centres also requires nurses to be the frontline care providers. Nurses deliver nursing care within healthcare facilities and provide direct community-based care through home visits as community nurses. They can educate patients about diseases, monitor health conditions such as blood pressure and blood glucose levels, and perform independent nursing interventions such as relaxation techniques for pain management. Several limitations are common in rural areas, including limited patient awareness of seeking healthcare services, which often leads to preventable complications. Additionally, beneficial interventions are sometimes not effectively communicated to patients. The challenges include inadequate preparedness for communication, limited access to healthcare facilities, financial constraints, and low motivation (Su et al., 2025). This scoping review aims to synthesize evidence-based studies from research databases to identify nursing interventions for preventing and managing non-communicable diseases among populations living in rural communities.

METHOD

This study employed a scoping review design to systematically identify and map existing evidence on nursing interventions for the prevention and management of non-communicable diseases (NCDs) in rural populations. The scoping review methodology was chosen because it enabled exploration of the breadth and nature of nursing interventions across diverse contexts and study designs (Munn et al., 2022). The review was conducted in accordance with the PRISMA-ScR guidelines to ensure transparent and comprehensive reporting (Tricco et al., 2018)

Literature searches were conducted in three electronic databases, namely ProQuest, PubMed, and EBSCOhost, using Boolean operators ("AND" and "OR") and predefined keywords in the title/abstract and MeSH terms. The search strategy included combinations of the following terms: (rural population OR rural health) AND (nursing intervention OR health education OR counseling OR home visit OR community nursing) AND (prevention OR risk reduction OR lifestyle change OR behavior change) AND (noncommunicable disease OR NCDs OR chronic disease). The search was restricted to articles published in English within the last ten years. Article screening was performed using the Rayyan software (Mourad et al., 2016), with inclusion criteria focusing on studies that reported nursing-led interventions, were conducted in rural settings, and addressed NCD prevention or management.

Three independent reviewers with expertise in nursing management, emergency nursing, and community nursing independently conducted the screening and data extraction processes using a standardized protocol. The screening was performed in two stages, including title and abstract screening followed by full-text assessment, and any discrepancies were resolved through discussion and consensus. A total of 4,170 records were identified, of which 309 duplicates were removed and

166 were excluded as irrelevant, leaving 3,695 articles for screening. Subsequently, 3,544 articles were excluded based on the inclusion criteria, resulting in 115 articles for full-text review. After full-text assessment, 96 studies were excluded because the interventions were not nurse-led or the articles were systematic reviews or opinion papers. Of the remaining 19 studies, five were excluded due to methodological limitations, leaving 14 studies included in the final scoping review.

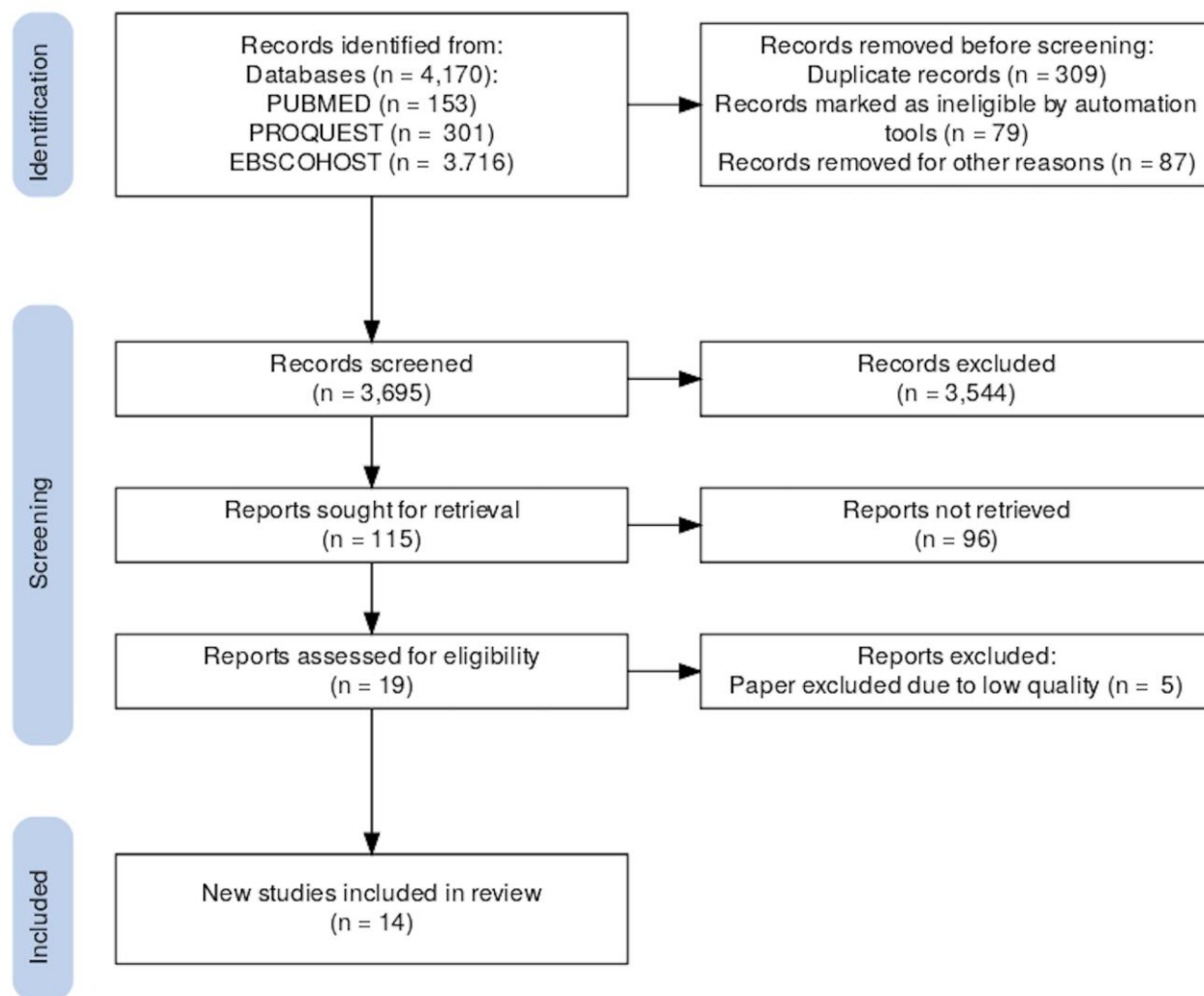


Figure 1. PRISMA flow diagram of the study selection process for the scoping review

RESULT

The synthesis of the selected studies is presented in Table 1, which summarizes the study objectives, research designs, settings, and populations, nursing interventions, and key outcomes. The fourteen included studies were conducted over the last ten years in rural areas across 11 countries, including three studies in Australia (Sydney, Queensland, and South Australia), West Virginia (USA), Portugal, Spain, China, Canada, Africa, Iran, the Netherlands, Turkey, and Rwanda. The study designs included four qualitative studies, one cohort study, two quasi-experimental studies, three randomized controlled trials, two descriptive studies, and one anthropological study.

Nurse-led interventions were diverse and aimed at both preventing and managing non-communicable diseases. Several interventions incorporated technological innovations and interdisciplinary collaboration, such as telehealth-based nursing interventions (Davis et al., 2020), and nurse-led interdisciplinary collaboration programs, including the Community Health Navigator program (Harris et al., 2024). Independent nursing interventions included health education programs (Gomes et al., 2021), nurse-led health education (Hu et al., 2022), group-based health education (Smith et al., 2016), nursing home visits (Housden et al., 2017), diabetes and hypertension management models (Frieden et al., 2020), and self-management support programs

(Kurt & Gurdogan, 2022). In addition, nursing students participated in interprofessional practice-based interventions through student-led interprofessional health clinics (Hulme et al., 2024), and experiential learning programs (“learning by doing”) in collaboration with senior nurses (Pérez-Rivas et al., 2023).

Several challenges were identified in implementing both independent and nurse-led collaborative interventions. These challenges included coordination and communication issues during intervention delivery (Davis et al., 2020; Frieden et al., 2020), patient engagement and participation (Hulme et al., 2024; Smith et al., 2016), time constraints in intervention implementation (Gomes et al., 2021; Mohebi et al., 2025), nurses’ knowledge and skill limitations (Gomes et al., 2021; Housden et al., 2017; Hu et al., 2022; Kurt & Gurdogan, 2022; Pérez-Rivas et al., 2023), the sustainability of nurse involvement (Kurt & Gurdogan, 2022; Westland et al., 2018), and the need for continuous monitoring and evaluation (Ndayisaba et al., 2017).

Table 1.
Synthesis of Nursing Intervention Studies

Author (Year)	Study Setting	Study Aim	Study Design	Nursing Intervention	Key Findings	Challenges
Davis et al. (2020)	West Virginia, USA	To explore the application of a model for complex nursing interventions and to design a telehealth intervention	Focus group discussions and Delphi study	Telehealth intervention	A pilot protocol was developed; remote monitoring enabled early identification and prevention of disease through tele-assessment and telephone-based nursing interventions	Coordination among stakeholders, nurses’ academic and clinical competencies, ability to provide guidance via telephone, workload, and time constraints
Hulme et al. (2024)	Southern Queensland, Australia	To evaluate the effectiveness of a student-led interprofessional clinic and assess health improvements among participants	Cohort study with repeated measures	Student-led interprofessional health clinic	The program improved aerobic capacity, strength, and quality of life, and helped maintain participants’ health status	Participant dropout and irregular attendance during the program
Harris et al. (2024)	Sydney Local Health District, Australia	To identify the potential role of Community Health Navigators (CHNs) in addressing patient needs	Qualitative study	Community Health Navigator program	CHNs supported patients through needs assessment, trust-building, and culturally and linguistically appropriate social and emotional support, family engagement, medication adherence support, and appointment coordination	Limited face-to-face interaction due to COVID-19 restrictions
Gomes et al. (2021)	Northern Portugal	To provide essential care through an educational intervention program to	Quasi-experimental study with two groups	Health Education Program	A significant positive relationship was found between self-care skill development and	Short follow-up period; longer follow-up required;

Author (Year)	Study Setting	Study Aim	Study Design	Nursing Intervention	Key Findings	Challenges
		improve patients' quality of life			quality of life (p < 0.001)	continuous professional development needed for nurses
Pérez-Rivas et al. (2023)	Spain	To determine the effectiveness of a "learning by doing" strategy based on the nursing process on nursing students' lifestyles	Quasi-experimental pre-post study	Learning by doing program	The program significantly improved students' lifestyles, particularly among those at risk (p < 0.001)	Participant non-adherence and a short follow-up period for sustained lifestyle changes
Hu et al. (2022)	Hangzhou, China	To examine the effects of nurse-led health education on self-management ability, satisfaction, and life fulfillment among older adults	Randomized controlled trial	Nurse-led health education	Based on the knowledge-belief-practice model, the intervention improved self-management ability, satisfaction, and life fulfillment among older adults with COPD	Need to assess factors influencing pulmonary rehabilitation to tailor management strategies
Smith et al. (2016)	South Australia	To evaluate patient perceptions of group education and its impact on health service reorientation	Anthropological study	Group-based health education	Patients reported improved social connections, shared experiences in diabetes care, peer support and motivation, and increased knowledge of type 2 diabetes and other health issues	Group participation and engagement in discussions
Housden et al. (2017)	Canada	To examine barriers and facilitators to implementing nurse-led group medical visits	Case study with in-depth interviews and direct observation	Nurse practitioner-led group medical visits	Group medical visits enhanced leadership and interprofessional collaboration; patients reported increased confidence in managing their conditions	Nurses required comprehensive knowledge across multiple conditions due to frequent patient and family discussions
Frieden et al. (2020)	Chipinge Rural District, Sub-Saharan Africa	To describe nurses' experiences in organizing care models for diabetes and hypertension in rural areas	Descriptive programmatic study	Diabetes and hypertension management model	Effective rural care models included decentralization, integrated care, simplified protocols, mentorship, task shifting, accessible	Need for sustained mentorship support and subsidies for medications and laboratory testing

Author (Year)	Study Setting	Study Aim	Study Design	Nursing Intervention	Key Findings	Challenges
					medications and laboratory tests, patient empowerment, monitoring, evaluation, and referral systems	
Mohebi et al. (2025)	Iran	To apply Orem's model to improve self-care behaviors and lifestyle changes in patients at home	Randomized controlled clinical trial	Orem-based discharge and self-care program	Lifestyle change, hope, and treatment adherence were significantly higher in the intervention group after 3 months ($p < 0.05$)	Time interval between intervention and observable patient outcomes
Westland et al. (2018)	Netherlands	To evaluate nurses' perceptions of the feasibility and implementation of a behavioral intervention	Qualitative study with cluster-randomized trial	Behavioral change intervention to increase physical activity in cardiac patients	Nurses reported the intervention required knowledge, skills, structured consultation adherence, and ongoing training; feasibility depended on routine implementation and professional development opportunities	Sustained nurse engagement and continuity of implementation
Kurt & Gurdogan (2022)	Edirne Province, Turkey	To determine the effect of self-management support on knowledge level, treatment adherence, and self-care	Randomized controlled study	Self-management support intervention	Significant improvements in patient knowledge, treatment adherence, and self-care ($p = 0.000$), with reductions in systolic and diastolic blood pressure in the intervention group	Need for continuous monitoring and evaluation; nurses' knowledge and skills in providing self-management support
Ndayisaba et al. (2017)	Rural Rwanda	To describe clinical mentorship and quality improvement programs supporting nurses in type 2 diabetes care	Descriptive study	Clinical mentorship and quality improvement program	Nurses trained in NCD management and mentorship adhered to diabetes care protocols	Incomplete patient data systems; mentee nurses required continuous mentorship to maintain protocol adherence

DISCUSSION

Nursing interventions also utilized advancements and innovations in communication and care delivery, including telehealth-based nursing interventions (Davis et al., 2020). In the nursing profession, telehealth is often called telenursing, using technology to provide nursing care via computers, mobile phones, and remote monitoring devices. This method allows nurses to deliver

care remotely, eliminating the need for in-person home visits (Gagnon, 2024). Telehealth is seen as an effective and efficient approach to overcome geographical and temporal barriers, facilitating access for populations in remote areas (Beluan & Sukihananto, 2024). The adoption of telehealth often encounters obstacles related to the readiness of the technological infrastructure. Numerous places remain deficient in internet connectivity and the technology resources necessary for telehealth systems (Jefferies et al., 2021; Sari et al., 2024). Telehealth has been adopted in Indonesia's healthcare services; however, its nationwide implementation is hindered by limited technological infrastructure.

This review identified the Community Health Navigator (CHN) program as a nurse-led interdisciplinary cooperation (Harris et al., 2024). Community Health Navigators act as intermediaries between communities and healthcare services. Their responsibilities encompass facilitating medication compliance, advocating for behavioral and lifestyle modifications, delivering health education and counseling, and coordinating treatment and referrals with community nurses (Mistry et al., 2021). Nurses implemented health education through several methods, including organized health education programs (Gomes et al., 2021), nurse-led health education (Hu et al., 2022), and group-based health education (Smith et al., 2016).

The health education program executed by Gomes (2021) was meticulously designed and administered to enhance knowledge and foster behavioral change in communities. Nurse-led health education, as articulated by Hu et al. (2022), designates nurses as facilitators accountable for overseeing the comprehensive educational process for individuals or groups, tailored to patient needs. According to Smith (2016), group-based health education served as a platform for counseling and peer engagement, allowing participants to exchange experiences, offer mutual encouragement, and provide social support for behavioral change.

These three methodologies sought to provide efficient, evidence-informed education customized to the requirements of individuals and groups. Obstacles to implementing health education include patient involvement in interventions (Hulme et al., 2024; Smith et al., 2016), time constraints, and nurses' familiarity with educational topics (Gomes et al., 2021). Confronting these issues requires effective communication, adequate technological support, and patient empowerment, enabling participants to use the knowledge and skills they gain to manage their health (Hasyim, 2024). Nursing home visits were among the most frequently performed nursing interventions, especially in community nursing (Housden et al., 2017). Nurses performed routine visits to assess patient conditions, deliver health education, enhance medication compliance, and provide psychosocial support to patients and their families. These visits bolstered patients' and families' confidence in the care delivered, thereby fostering ongoing self-care and autonomy.

Another nursing intervention identified was the diabetes and hypertension management model (Frieden et al., 2020), which emphasized community-based management through integrated, evidence-based healthcare services. This paradigm prioritized early disease identification via screening, prompt intervention, ongoing surveillance, and interdisciplinary cooperation. A comparable, however, more personalized strategy was self-management support (Kurt & Gurdogan, 2022), which equipped patients to oversee their own health via education, skill development, and motivation to sustain bodily and mental wellness. These treatments established a comprehensive framework for non-communicable disease (NCD) management in communities, with the objective of preventing illness complications and progression.

Nurses receive training throughout their education to collaborate and model healthy habits for patients and communities, ultimately improving health outcomes through role modeling. Clinical mentoring and quality improvement initiatives engaged junior nurses (mentees) under the guidance of senior nurses (mentors), with mentees communicating patient progress to mentors to enhance care quality (Ndayisaba et al., 2017). Nursing students participated early in their study through

experiential learning and collaboration with senior nurses in student-led interprofessional health clinics (Hulme et al., 2024) and hands-on learning methodologies (Pérez-Rivas et al., 2023). These encounters facilitated students' comprehension of the breadth of nursing practice, patient-centered care, and interdisciplinary collaboration (Hopkins et al., 2022).

CONCLUSION

This scoping review demonstrated that nurses have published research findings based on nursing interventions implemented both independently and through nurse-led collaborative approaches. Standard nursing interventions for the prevention and care of patients with non-communicable illnesses include telehealth, home visits, and health education delivered through various methods, both individually and in group settings.

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