

Effectiveness of community health nurse-led health promotion strategies for preventing non-communicable diseases: a systematic review

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Abstract:

Non-communicable diseases (NCDs) are among the most important public health challenges worldwide and are responsible for a substantial proportion of premature mortality, disability, reduced quality of life and healthcare expenditure. Cardiovascular diseases, cancers, diabetes mellitus and chronic respiratory diseases account for the majority of NCD-related morbidity and mortality. Although many NCDs are preventable through modification of behavioural and metabolic risk factors, prevention remains difficult because health behaviours are influenced by social, economic, environmental and cultural conditions. Community health nurses occupy a strategically important position between individuals, families, communities and primary healthcare systems. Their continuing contact with populations enables them to provide health education, risk assessment, lifestyle counselling, screening, behavioural support, referral, follow-up and community mobilisation. This systematic review examines the effectiveness of community health nurse-led and closely related community health worker-led health promotion strategies in preventing NCDs and reducing modifiable risk factors. A structured evidence synthesis was undertaken using evidence from PubMed-indexed systematic reviews, meta-analyses, primary studies and major World Health Organization technical documents addressing community-based NCD prevention, community nursing, nurse-led health promotion, community health workers, lifestyle modification, cardiovascular risk reduction, diabetes prevention, tobacco cessation, cancer screening and task-sharing. Evidence was synthesised narratively because substantial heterogeneity existed in intervention design, populations, outcomes, duration and healthcare settings. The review was guided by the principles of PRISMA 2020. Particular attention was given to blood pressure, lipid levels, glucose regulation, body weight, physical activity, smoking cessation, cancer screening, health knowledge, self-management and access to preventive services. The evidence indicates that community health nurse-led health promotion strategies can improve several modifiable NCD risk factors. Community-based interventions have demonstrated reductions in systolic and diastolic blood pressure, low-density lipoprotein cholesterol, triglycerides, fasting blood glucose and body weight, although effect sizes vary between programmes. Nurse-led hypertension interventions appear capable of producing clinically meaningful improvements in blood pressure and cardiovascular risk management. Community health worker involvement in smoking cessation has been associated with increased abstinence, while community-based interventions can improve physical activity and reduce sedentary behaviour. Community-based diabetes prevention programmes involving education, nutritional counselling, physical activity promotion, behavioural support and follow-up have shown improvements in glycaemic and anthropometric outcomes. Community health worker involvement also improves uptake of breast, cervical and colorectal cancer screening. The most effective programmes tend to be multicomponent, culturally adapted, repeated over time, linked to primary healthcare services and supported by supervision and referral mechanisms. Community health nurse-led health promotion represents an effective and potentially scalable approach to NCD prevention, particularly when integrated into primary healthcare and community systems. Nurses can contribute across the prevention continuum, from population education and risk assessment to screening, behaviour modification and continuing follow-up. However, implementation is affected by workload, workforce shortages, training, remuneration, supervision, referral pathways, access to diagnostic resources and social determinants of health.

Future programmes should prioritise culturally appropriate, community-oriented, digitally supported and multidisciplinary models with measurable long-term outcomes.

Keywords:

community health nursing; community health nurses; health promotion; non-communicable diseases; cardiovascular disease; diabetes prevention; cancer prevention; lifestyle modification; primary healthcare; community health workers; NCD prevention.

1. Introduction:

Non-communicable diseases represent a major and increasingly complex challenge for health systems across the world. Unlike acute infectious diseases, NCDs generally develop gradually and are influenced by interactions among genetic susceptibility, behavioural factors, environmental exposures, social circumstances and health-system determinants. The four major groups—cardiovascular diseases, cancers, chronic respiratory diseases and diabetes—account for most NCD-related deaths globally. The World Health Organization reported that NCDs caused at least 43 million deaths in 2021, representing approximately three quarters of deaths unrelated to pandemics. Cardiovascular diseases were responsible for the largest share, followed by cancers, chronic respiratory diseases and diabetes (World Health Organization, 2025).

The distribution of the NCD burden is particularly concerning in low- and middle-income countries (LMICs), where premature mortality is frequently associated with limited access to preventive services, delayed diagnosis, fragmented chronic disease care and socioeconomic disadvantage. Many populations simultaneously experience undernutrition, infectious diseases and increasing exposure to obesity, tobacco use, unhealthy diets, physical inactivity and environmental risks. This epidemiological transition creates substantial pressure on primary healthcare systems.

The prevention of NCDs is therefore not exclusively a medical responsibility. Prevention requires sustained population-level action combined with individual and family-level support. Tobacco cessation, healthy dietary behaviour, regular physical activity, appropriate body weight, reduced alcohol-related harm, blood pressure control and early detection of metabolic abnormalities are central components of NCD prevention. The World Health Organization emphasises that behavioural and metabolic risk factors are important targets for prevention and that detection, screening, treatment and continuing care need to be incorporated into health systems (World Health Organization, 2025).

Community health nurses are well positioned to contribute to this agenda. Their work traditionally extends beyond treatment of established illness and includes health education, disease prevention, maternal and child health, environmental health, community mobilisation, screening, home visits, referral and health promotion. Because nurses frequently interact with individuals and families over extended periods, they can reinforce healthy behaviours and identify risk factors before disease becomes clinically advanced.

Primary healthcare is particularly important because it represents the point at which population health promotion can be integrated with screening and continuity of care. The WHO Package of Essential Noncommunicable Disease Interventions (PEN) was developed to support cost-effective NCD interventions in primary healthcare and resource-constrained settings. The package emphasises integrated management and the use of healthcare workers beyond physicians to improve the reach of essential NCD services (World Health Organization, 2010; World Health Organization, 2020).

Similarly, the WHO HEARTS technical package incorporates healthy-lifestyle counselling, risk assessment, team-based care, standardised treatment and monitoring within primary healthcare. The healthy-lifestyle component specifically addresses behavioural cardiovascular risk factors and supports brief counselling approaches that can be incorporated into routine clinical encounters (World Health Organization, 2018).

The concept of community health nurse-led health promotion has consequently evolved from isolated health education sessions to more comprehensive interventions involving risk assessment, behavioural counselling, motivational support, screening, referral, follow-up, family engagement and community mobilisation.

Despite this potential, evidence regarding effectiveness is dispersed across disease-specific research areas. Studies have evaluated nurse-led hypertension management, community-based physical activity programmes, diabetes prevention interventions, smoking cessation, cancer screening and multifactorial cardiovascular prevention. The interventions also vary in intensity and in the degree to which nurses work independently or as part of multidisciplinary teams.

Therefore, a synthesis of the evidence is important to determine which community health nurse-led strategies are most consistently associated with beneficial outcomes, which populations are most likely to benefit and what implementation conditions are required for sustainable impact.

2. Rationale for community health nurse-led ncd prevention:

The prevention of NCDs requires repeated interaction rather than one-time communication. Individuals may understand that smoking is harmful or that physical activity is beneficial but still experience difficulty changing behaviour. Behavioural change is influenced by motivation, social norms, household circumstances, food availability, work patterns, economic constraints and access to safe environments for physical activity.

Community health nurses can provide continuity between health information and practical behaviour change. Instead of simply advising an individual to "eat healthily" or "exercise more", nurses can assess barriers, establish achievable goals, monitor progress and provide repeated reinforcement.

The community setting also provides an opportunity to identify people who do not regularly attend hospitals or specialist clinics. This is particularly relevant in rural and underserved populations, where transportation costs, geographical distance, health literacy and financial barriers can limit access to preventive services.

Evidence from primary care nursing research indicates that nurses can provide effective care and achieve health outcomes comparable with physician-led care for several conditions when appropriate protocols, training and support are available (Keleher et al., 2009).

Community health workers and nurses can also extend health services through home visits, community meetings, telephone follow-up and group education. This approach is consistent with task-sharing principles, in which appropriate health-related tasks are distributed across different cadres of health professionals according to training and competence.

3. Conceptual framework of community nurse-led ncd prevention:

Community health nurse-led prevention can be understood as a continuum extending from population-level health promotion to individual risk management.

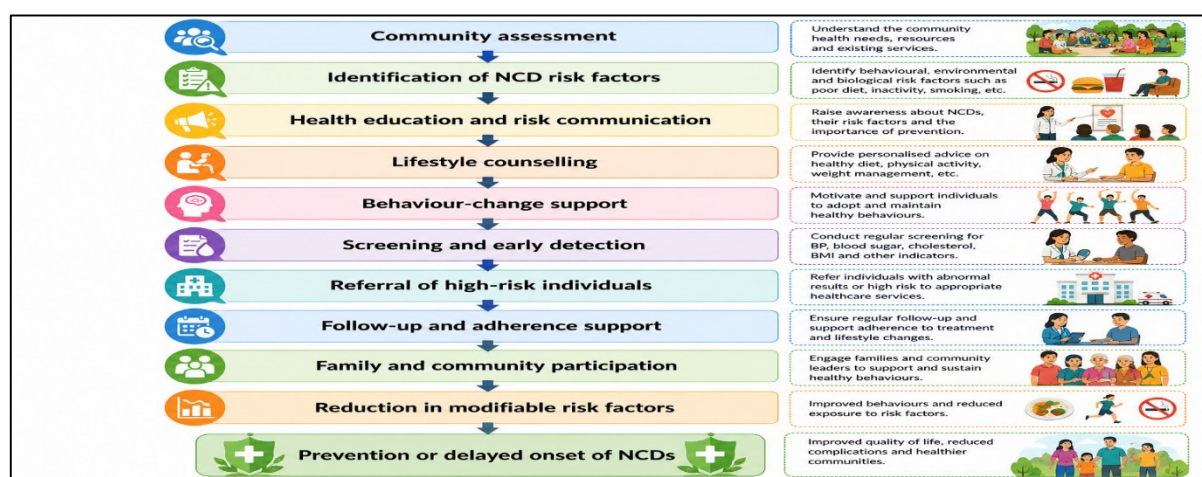


Figure 1: Conceptual framework for community health nurse-led NCD prevention

The framework demonstrates that community nursing interventions should not be considered isolated educational activities. Their effectiveness depends on continuity between assessment, intervention, referral and follow-up.

4. Objectives of the review:

The primary objective of this systematic review was to evaluate the effectiveness of community health nurse-led health promotion strategies in preventing NCDs.

The specific objectives were:

1. To examine the effectiveness of community nurse-led interventions in reducing cardiovascular risk factors.
2. To assess the effects of community-based interventions on blood pressure and metabolic outcomes.
3. To examine the contribution of community nurses and community health workers to diabetes prevention.
4. To evaluate community-based smoking cessation strategies.
5. To assess the effectiveness of community-based physical activity promotion.
6. To examine the role of community health workers in cancer prevention and screening.
7. To identify intervention components associated with greater effectiveness.

8. To identify barriers and facilitators affecting implementation.
9. To consider the applicability of community nurse-led prevention in resource-limited settings.

5. Review methodology:

5.1. Review design:

A structured systematic evidence review was undertaken to synthesise research concerning community health nurse-led and community health worker-supported health promotion strategies for NCD prevention. Reporting principles were informed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement. PRISMA 2020 provides updated guidance for transparent reporting of systematic reviews, including study identification, screening, eligibility assessment and synthesis (Page et al., 2021).

Because the available literature includes randomised trials, systematic reviews, meta-analyses, implementation studies and technical guidance, a narrative synthesis was used rather than combining all findings statistically.

5.2. Review question:

The review question was structured around the following elements:

Population: Adults, families and community populations at risk of NCDs.

Intervention: Community health nurse-led or community health worker-supported health promotion interventions.

Comparison: Usual care, standard health education, alternative intervention or no intervention.

Outcomes: Behavioural, metabolic, clinical, screening and health-service outcomes relevant to NCD prevention.

5.3. Search strategy:

Evidence was identified through PubMed-indexed literature and relevant WHO publications addressing community nursing, community health workers, NCD prevention, lifestyle modification, cardiovascular risk reduction, hypertension, diabetes prevention, tobacco cessation, physical activity, cancer screening and task-sharing.

Search concepts included combinations of terms such as:

- "community health nurse"
- "community nursing"
- "community health worker"
- "nurse-led"
- "health promotion"
- "noncommunicable disease"
- "cardiovascular disease prevention"
- "diabetes prevention"
- "hypertension"
- "smoking cessation"
- "physical activity"
- "cancer screening"
- "lifestyle intervention"
- "primary healthcare"

5.4. Eligibility:

Evidence was considered relevant when it examined community-oriented interventions delivered by nurses, community health workers or multidisciplinary teams involving nurses and when the intervention addressed NCD prevention or a major modifiable risk factor.

Studies focused exclusively on inpatient treatment, acute hospital care or highly specialised pharmacological treatment without a health promotion component were not prioritised.

5.5. Data synthesis:

Because intervention designs, populations and outcomes varied considerably, findings were synthesised thematically under:

- cardiovascular risk reduction;
- hypertension prevention and management;

- diabetes prevention;
- physical activity;
- nutrition and weight management;
- tobacco cessation;
- cancer prevention and screening;
- health education and health literacy;
- digital and remote support;
- task-sharing and multidisciplinary care;
- equity and accessibility;
- implementation and sustainability.

6. Overview of the evidence:

The literature demonstrates that community-based health promotion is most effective when interventions are multifactorial rather than restricted to a single educational message.

A systematic review and meta-analysis of community-based cardiovascular disease prevention programmes involving 48 studies reported improvements in systolic and diastolic blood pressure, LDL cholesterol, triglycerides, total cholesterol, fasting blood glucose and body weight (Soltani et al., 2021).

More recent evidence similarly supports the cardiovascular benefits of community care. Zhang et al. (2025) synthesised 15 randomised controlled trials involving more than 10,000 participants and reported reductions in systolic and diastolic blood pressure, LDL cholesterol and triglycerides, as well as a reduction in smoking persistence.

These findings are important because they demonstrate that relatively modest improvements in multiple risk factors can collectively contribute to substantial reductions in cardiovascular risk.

7. Community nurse-led cardiovascular disease prevention:

Cardiovascular disease is the leading contributor to NCD mortality. Its major modifiable risk factors include hypertension, tobacco use, unhealthy diet, physical inactivity, obesity, dyslipidaemia and diabetes.

Community health nurses can contribute to cardiovascular prevention through:

- blood pressure measurement;
- cardiovascular risk assessment;
- dietary counselling;
- physical activity counselling;
- smoking cessation support;
- weight management;
- medication adherence support;
- follow-up;
- referral;
- community screening;
- family education.

The WHO HEARTS framework supports a team-based approach in primary healthcare and explicitly recognises the contribution of different healthcare workers to cardiovascular prevention and management (World Health Organization, 2018).

A community-based intervention can be particularly useful for individuals who have elevated risk but have not yet developed symptomatic cardiovascular disease. Regular contact allows nurses to identify trends rather than relying on a single measurement.

Community-based cardiovascular prevention programmes have demonstrated improvements in multiple risk factors simultaneously. Soltani et al. (2021) found reductions in blood pressure, LDL cholesterol, triglycerides, total cholesterol, fasting blood glucose and body weight following community-based interventions.

The evidence suggests that multifactorial interventions may be more useful than isolated risk-factor interventions because cardiovascular risk factors frequently cluster. A person with obesity may also have hypertension, impaired glucose regulation, physical inactivity and unhealthy dietary behaviour.

8. Nurse-led hypertension prevention and control:

Hypertension is one of the most important modifiable risk factors for stroke, coronary heart disease, heart failure and kidney disease. Community-based blood pressure interventions are therefore an important component of NCD prevention.

Nurse-led hypertension interventions may include:

1. blood pressure screening;
2. repeated measurement;
3. lifestyle counselling;
4. dietary sodium reduction;
5. weight-management support;
6. physical activity counselling;
7. medication adherence support;
8. home monitoring;
9. referral for uncontrolled hypertension;
10. follow-up.

A systematic review and meta-analysis of 11 randomised trials involving 4,454 participants found that nurse-led interventions in general practice had beneficial effects on blood pressure and cardiovascular risk-factor management (Nurse-led interventions to manage hypertension, 2022).

Evidence from LMICs also supports community health worker involvement. Mbuthia et al. (2022) reviewed community health worker interventions for hypertension management and control in LMICs and identified a range of strategies involving education, blood pressure measurement, referral, adherence support and lifestyle counselling.

The importance of community-based hypertension programmes is enhanced in settings where healthcare facilities are geographically distant. A community nurse can identify elevated blood pressure, initiate appropriate referral, reinforce lifestyle modification and monitor whether the individual reaches the healthcare facility.

9. Diabetes prevention:

Type 2 diabetes mellitus is strongly influenced by modifiable lifestyle and metabolic risk factors. Prevention strategies therefore provide an important opportunity for community health nursing.

The main community-level strategies include:

- identification of people at increased diabetes risk;
- dietary education;
- weight reduction;
- physical activity;
- reduction of sedentary behaviour;
- glucose screening;
- self-management education;
- family participation;
- follow-up.

Community-based diabetes prevention interventions have historically included education and behavioural modification, particularly among populations experiencing a disproportionate burden of diabetes (Satterfield et al., 2003).

In LMICs, the role of community health workers is particularly relevant. A systematic review of community-based interventions for prevention of type 2 diabetes in LMICs found that most included multicomponent programmes incorporating health education, nutrition education, physical activity, counselling, psychosocial approaches and lifestyle modification. Interventions were delivered by community health workers, volunteers, social workers, community nutritionists and community nurses (Community-based interventions for prevention of Type 2 diabetes, 2018).

Another review found that community health workers involved in diabetes prevention and management contributed to education, identification and referral of high-risk individuals and social support through home visits. Positive outcomes were reported in many studies, including improvements in knowledge, treatment-seeking behaviour, medication adherence, fasting glucose, glycated haemoglobin and BMI (Community Health Workers in Diabetes Prevention and Management in Developing Countries, 2017).

These findings suggest that community nurses can serve as a bridge between population-level diabetes prevention and clinical services.

10. Physical activity promotion:

Physical inactivity is a major modifiable NCD risk factor. Community health nurses can promote physical activity through individual counselling, walking groups, community exercise programmes, family-based

interventions and referral to local physical activity resources.

A systematic review of community-based cardiovascular prevention interventions found significant improvements in the likelihood of achieving recommended physical activity levels at 12 months and at 18–24 months. Improvements were also identified in metabolic equivalents, moderate-to-vigorous physical activity, daily steps and sitting time (Community-based cardiovascular disease prevention interventions, 2021).

Earlier evidence similarly showed that community-based physical activity interventions can improve activity levels, particularly when they use face-to-face counselling or group-based approaches (Baker et al., 2013).

Community exercise programmes may also improve functional capacity and quality of life among individuals with chronic disease. Desveaux et al. (2014) found that community-based exercise programmes could improve functional capacity and health-related quality of life in selected chronic disease populations.

For community nurses, this evidence supports moving beyond generic advice such as "exercise regularly". Effective counselling should include specific, achievable goals.

For example:

Assessment → Goal setting → Activity selection → Barrier identification → Follow-up → Reinforcement

Walking programmes can be particularly useful because they require little equipment and can be adapted to different levels of fitness.

11. Nutrition and weight management:

Unhealthy diets and excess body weight are major contributors to cardiovascular disease and type 2 diabetes. Community health nurses can provide nutrition education, encourage healthy meal planning, support weight-management goals and refer individuals to dietetic services when appropriate.

The community environment provides an opportunity to make nutritional counselling culturally relevant. Instead of prescribing generic diets, nurses can discuss locally available foods, cooking practices, portion size, salt intake, sugar-sweetened beverages and food purchasing patterns.

Multicomponent cardiovascular prevention programmes have demonstrated reductions in body weight and metabolic risk factors (Soltani et al., 2021).

Community-based diabetes prevention programmes also frequently combine nutrition education with physical activity and behavioural counselling, suggesting that dietary interventions are most effective when integrated with broader lifestyle programmes rather than delivered as isolated lectures.

12. Tobacco cessation:

Tobacco use remains one of the most preventable causes of NCD-related mortality. Community health nurses can play a central role in tobacco control through screening for tobacco use, brief interventions, motivational counselling, relapse prevention and referral.

A systematic review specifically examining community health worker involvement in smoking cessation identified five studies involving 3,513 smokers and found higher smoking cessation rates when community health workers were incorporated into usual care (Community health workers involvement in smoking cessation programme, 2020).

The role of nurses in tobacco cessation is also expanding. A recent systematic review and network meta-analysis evaluated nurse-led smoking cessation interventions across randomised controlled trials and highlighted the importance of nurse-delivered behavioural interventions for tobacco abstinence (Cheung et al., 2025).

Community nursing can be particularly valuable for tobacco users who may not seek dedicated cessation services. Brief intervention during routine community encounters provides an opportunity to identify tobacco use and establish a cessation plan.

A practical community nursing model can include:

Ask → Advise → Assess readiness → Assist → Arrange follow-up

Repeated contact is important because tobacco cessation often involves multiple attempts.

13. Cancer prevention and screening:

Although nurses cannot prevent all cancers, community health nurses can contribute substantially to primary prevention and early detection.

Community health workers have demonstrated effectiveness in increasing cancer screening participation. A large systematic review by Okasako-Schmucker et al. (2023) included 76 studies and found increases in breast, cervical and colorectal cancer screening following interventions involving community health workers.

Community-based health worker interventions have also been associated with increased participation in breast, cervical and bowel cancer screening. A systematic review and meta-analysis found that participation in community health worker interventions increased the likelihood of cancer screening (Are community-based health worker interventions, 2018).

Community nurses can contribute through:

- identifying eligible individuals;
- providing cancer prevention education;
- explaining screening procedures;
- addressing myths and fears;
- supporting informed decision-making;
- arranging appointments;
- facilitating referral;
- following up missed appointments.

The effectiveness of screening interventions may be especially important in underserved populations because social and healthcare access barriers can result in delayed diagnosis.

14. Health education and health literacy:

Health education remains a fundamental component of community nursing. However, education alone is unlikely to produce sustained behavioural change.

Traditional health education often assumes that knowledge automatically leads to healthy behaviour. In reality, behaviour is influenced by motivation, confidence, social support, environment and economic resources.

Therefore, community health nurse-led education should include:

- interactive communication;
- motivational interviewing principles;
- goal setting;
- problem solving;
- reinforcement;
- family involvement;
- culturally appropriate examples;
- repeated contact.

Community health workers have demonstrated potential to improve patient knowledge and health behaviours, particularly when their interventions are embedded in ongoing community programmes (Lewin et al., 2005).

Health literacy is also important. Individuals need to understand risk information, screening results, medication instructions and lifestyle recommendations.

15. Digital and remote health promotion:

Digital health technologies have expanded opportunities for community-based NCD prevention. Nurses can use telephone calls, text messages, mobile applications, video consultations and remote monitoring to maintain contact with individuals between face-to-face visits.

Remote lifestyle programmes may be particularly useful for people who experience transportation, work or geographical barriers. A systematic review of remotely administered lifestyle programmes for diabetes prevention found that several studies demonstrated reductions in weight and/or glycaemic biomarkers, suggesting that remote delivery can be a promising alternative or complement to face-to-face interventions (Tobias et al., 2022).

Digital interventions should not replace human interaction completely. Rather, they can extend the reach of community nursing.

16. Community-based screening and early detection:

Prevention includes both primary prevention and early identification of risk.

Community health nurses can facilitate screening for:

- hypertension;
- obesity;
- diabetes risk;
- elevated blood glucose;
- tobacco use;
- cardiovascular risk;

- selected cancer screening eligibility;
- physical inactivity;
- dietary risk.

Screening programmes are particularly important in populations with low healthcare utilisation.

The WHO PEN framework supports integrated approaches to early detection and management of cardiovascular disease, diabetes, chronic respiratory disease and cancer within primary healthcare (World Health Organization, 2020).

However, screening should not occur without a referral pathway. Identifying disease without ensuring access to confirmatory diagnosis and treatment may produce anxiety without improving outcomes.

Therefore, screening programmes should be designed as:

Screening → Confirmation → Risk stratification → Referral → Treatment/management → Follow-up

17. Family and community participation:

NCD risk behaviours frequently occur within families. Dietary habits, smoking patterns, physical activity and attitudes toward healthcare may be shared among household members.

Family-centred nursing therefore has the potential to increase intervention effectiveness. For example, rather than counselling only one person with obesity, nurses can encourage healthier meals and shared physical activity across the household.

Community participation can also improve programme acceptability. Local leaders, schools, workplaces, women's groups, community organisations and voluntary organisations can support health promotion campaigns.

Community health worker programmes are more likely to be sustainable when they fit local community needs and are integrated into broader health systems (Pallas et al., 2013).

18. Cultural adaptation:

One of the major strengths of community health nursing is the possibility of cultural adaptation.

Health promotion messages should consider:

- local food practices;
- language;
- literacy;
- religious and cultural practices;
- gender roles;
- household decision-making;
- occupation;
- socioeconomic conditions;
- local beliefs about illness.

Ali et al. (2020) found that culturally and linguistically adapted community lifestyle interventions showed potential for improving diabetes-related outcomes among South Asian populations in the United States.

This principle has broader relevance. A lifestyle intervention developed in a high-income country may not automatically be appropriate for rural populations in South Asia, Africa or other LMIC settings.

19. Task-sharing and multidisciplinary care:

Nurse-led prevention does not imply nurse-only care. Effective community programmes usually depend on multidisciplinary collaboration.

Potential team members include:

- community health nurses;
- community health workers;
- physicians;
- pharmacists;
- dietitians;
- physiotherapists;
- psychologists;
- laboratory personnel;
- social workers;
- health educators.

Task-sharing is particularly important in LMICs where physician shortages can limit access to preventive

services.

A systematic review of task-shifting for NCD management in LMICs found evidence supporting the involvement of non-physician health workers in selected NCD-related tasks (Joshi et al., 2014).

More recent evidence suggests that task-sharing can support NCD prevention and control when appropriate training, supervision, protocols and referral systems are available (Tesema et al., 2025).

The key issue is not simply transferring tasks from physicians to nurses. Instead, healthcare systems need to redesign workflows so that each professional performs activities according to competence.

20. Effectiveness of multicomponent interventions:

The strongest evidence in the reviewed literature generally relates to interventions that combine several strategies.

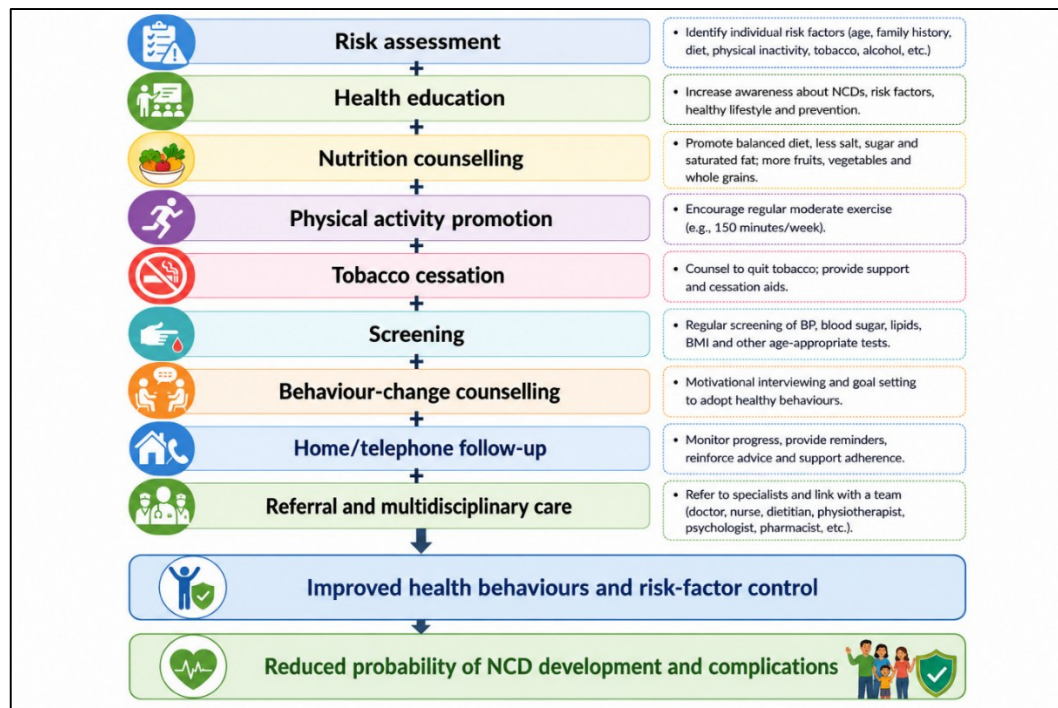


Figure. 2: Multicomponent community nursing intervention model

A multifactorial approach is logical because NCD risk factors are interrelated. For example, physical inactivity can contribute to obesity, insulin resistance and hypertension, while tobacco use may coexist with unhealthy dietary behaviour.

A systematic review of multifactorial primary-care interventions reported evidence that comprehensive strategies can reduce cardiovascular risk, although the magnitude of benefit varies among intervention models (Álvarez-Bueno et al., 2015).

Table. 1: Comparative Summary of Intervention Components

Intervention	Main target	Expected outcome	Evidence assessment
Blood pressure screening	Hypertension	Earlier identification	Strong
Lifestyle counselling	Multiple risk factors	Improved health behaviour	Moderate–strong
Physical activity promotion	Inactivity/obesity	Increased activity	Moderate–strong
Nutrition counselling	Diet/weight/metabolic risk	Improved diet and weight	Moderate
Smoking cessation	Tobacco use	Increased abstinence	Moderate–strong
Diabetes-risk screening	Dysglycaemia	Earlier intervention	Moderate
Diabetes lifestyle programme	Obesity/metabolic risk	Improved glucose and weight	Moderate

Intervention	Main target	Expected outcome	Evidence assessment
Cancer screening support	Delayed detection	Increased screening uptake	Strong
Home visits	Access/adherence	Improved continuity	Moderate
Telephone/digital follow-up	Continuity	Improved engagement	Emerging
Family education	Shared risk factors	Household behaviour change	Moderate
Community mobilisation	Population risk	Increased participation	Moderate

21. Outcomes of community health nurse-led interventions:

Blood Pressure

Blood pressure is one of the most consistently improved outcomes. Community and nurse-led interventions can provide repeated measurement, counselling and follow-up.

Community care meta-analysis evidence has demonstrated reductions in both systolic and diastolic blood pressure (Zhang et al., 2025).

Lipid Profile:

Community cardiovascular prevention programmes can also improve LDL cholesterol and triglycerides (Soltani et al., 2021; Zhang et al., 2025).

Blood Glucose:

Diabetes prevention interventions can improve fasting glucose and glycated haemoglobin, especially when dietary modification and physical activity are combined.

Body Weight:

Weight reduction is frequently observed in lifestyle programmes, although maintenance beyond the active intervention period remains challenging.

Physical Activity:

Community interventions can increase the likelihood of achieving recommended activity levels and reduce sedentary time (Community-based cardiovascular disease prevention interventions, 2021).

Smoking

Community health worker involvement can improve tobacco cessation outcomes, particularly when behavioural support is sustained (Community health workers involvement in smoking cessation programme, 2020).

Screening:

Community health worker programmes can increase uptake of cancer screening across several cancer types (Okasako-Schmucker et al., 2023).

Barriers to Implementation:

Despite promising evidence, community nurse-led NCD prevention is not automatically successful.

Workforce Shortages

Nurses and community health workers may already have substantial workloads related to maternal health, infectious disease control, immunisation and other public health activities.

Inadequate Training:

NCD prevention requires knowledge of behavioural counselling, cardiovascular risk assessment, diabetes prevention, nutrition, tobacco cessation and communication skills.

Limited Supervision:

Community health workers require regular supervision and access to senior clinical support.

Weak Referral Systems:

A community nurse may identify hypertension or abnormal glucose but be unable to ensure timely clinical assessment.

Resource Constraints:

Equipment such as validated blood pressure monitors, weighing scales, glucometers and educational materials may be limited.

Financial Barriers:

Patients may be unable to afford diagnostic tests, medications, transport or healthier foods.

Cultural Barriers:

Health recommendations that conflict with local dietary and social practices may be poorly accepted.

Inadequate Data Systems:

Without documentation and monitoring, programmes cannot determine whether intervention targets are being achieved.

A systematic review of barriers and facilitators to NCD care delivered by non-physician health workers identified health-system factors, workforce issues, training, supervision and referral mechanisms as important determinants of programme success (Ogedegbe et al., 2019).

Sustainability and Scale-Up:

The sustainability of community health programmes is a critical issue. A programme may produce excellent outcomes during a research trial but fail after funding ends.

Pallas et al. (2013) identified programme design, community fit and integration into the broader health environment as major determinants of successful scaling and sustainability of community health worker programmes.

Recent evidence on NCD-focused community health worker programmes suggests that economic evaluations increasingly support their potential cost-effectiveness, although major gaps remain in reporting programme costs, salaries and affordability (O'Donovan et al., 2025).

Sustainability therefore requires:

- integration into national health systems;
- stable financing;
- appropriate remuneration;
- defined job responsibilities;
- continuous training;
- supervision;
- reliable supplies;
- community participation;
- monitoring and evaluation.

22. Equity considerations:

Community-based prevention can reduce health inequalities by reaching populations that are poorly served by conventional healthcare.

Potential priority groups include:

- rural populations;
- low-income families;
- older adults;
- people with limited mobility;
- populations with low health literacy;
- migrants;
- socially marginalised groups;
- people living far from healthcare facilities.

Community health workers have been particularly effective in improving access to cancer screening among underserved populations (Okasako-Schmucker et al., 2023).

However, community programmes should not assume that all communities have equal capacity to participate. Intervention design must consider transportation, employment, caregiving responsibilities, gender-related barriers and digital access.

22.1. Implications for community health nursing practice:

The findings have several implications for professional practice.

First, community health nurses should consider NCD prevention a core component of routine community care rather than an additional activity.

Second, every community contact can be viewed as a preventive opportunity. A nurse conducting a home visit can ask about tobacco use, physical activity, diet, blood pressure history and diabetes risk.

Third, interventions should be individualised. People differ in readiness for behaviour change.

Fourth, community nurses should use evidence-based protocols and maintain clear referral mechanisms.

Fifth, documentation should include both intervention delivery and patient outcomes.

A practical community nursing workflow may be:

Assess → Identify risk → Educate → Agree goals → Intervene → Follow up → Reassess → Refer → Continue support

22.2. Implications for nursing education:

Nursing curricula should strengthen preparation in:

- epidemiology of NCDs;
- health promotion;
- behavioural science;
- motivational interviewing;
- nutrition;
- physical activity prescription principles;
- cardiovascular risk assessment;
- diabetes prevention;
- tobacco cessation;
- cancer screening;
- digital health;
- community mobilisation;
- programme evaluation.

Nurses should also be trained to interpret basic risk-factor data and communicate risk in understandable language.

22.3. Implications for health policy:

Health policies should formally recognise community nurses as essential NCD prevention providers.

Policy priorities should include:

1. workforce development;
2. competency-based training;
3. nurse-led screening protocols;
4. community NCD registers;
5. standardised referral pathways;
6. digital follow-up systems;
7. integration with primary healthcare;
8. financial support for community programmes;
9. performance monitoring;
10. evaluation of long-term outcomes.

The WHO PEN framework provides a practical foundation for integrating NCD prevention and management into primary healthcare, particularly in resource-limited settings (World Health Organization, 2020).

Strengths of Community Health Nurse-Led Prevention

The major strengths include:

Accessibility

Nurses can reach people outside hospitals and specialist clinics.

Continuity

Repeated contact facilitates long-term behavioural support.

Trust

Community nurses often develop sustained relationships with families.

Cost-effectiveness potential

Task-sharing can increase service coverage without requiring physician involvement in every preventive encounter.

Cultural competence

Local nurses may understand community norms and communication styles.

Integration

NCD prevention can be incorporated into existing community health activities.

Early detection

Community screening can identify risk before serious complications develop.

23. Limitations of the available evidence:

The evidence base also has important limitations.

First, community interventions are highly heterogeneous. Programmes differ in duration, intensity, staff composition and outcome measurement.

Second, many studies evaluate community health workers rather than professionally trained community health nurses. Although these cadres overlap in some functions, they are not interchangeable.

Third, follow-up periods are frequently insufficient to establish whether behavioural changes translate into long-term reductions in NCD incidence and mortality.

Fourth, interventions are often multifactorial, making it difficult to determine which component generated the observed effect.

Fifth, many studies are conducted in specific populations or health systems, limiting generalisability.

Sixth, implementation and cost data are frequently underreported.

Seventh, the literature from LMICs remains less extensive than evidence from high-income countries.

These limitations mean that the evidence supports community nursing as a promising and effective strategy but does not justify assuming that every nurse-led programme will produce equivalent outcomes.

24. Proposed community health nurse-led ncd prevention model:

Based on the reviewed evidence, a comprehensive community model can be proposed.



Figure. 3: Community health nurse-led NCD prevention pathway

The model emphasises that prevention should be continuous rather than episodic.

25. Discussion:

The overall evidence indicates that community health nurse-led health promotion can contribute meaningfully to NCD prevention. The most consistent improvements occur in intermediate outcomes such as blood pressure, physical activity, smoking behaviour, body weight, lipid profile, glucose regulation and screening uptake. The cardiovascular evidence is particularly strong. Community-based programmes have demonstrated improvements across several cardiometabolic risk factors (Soltani et al., 2021; Zhang et al., 2025).

This is clinically important because NCD prevention is cumulative. A small reduction in blood pressure combined with modest weight reduction, improved physical activity and smoking cessation may result in a substantially lower overall cardiovascular risk.

The evidence regarding diabetes prevention is similarly encouraging. Community-based programmes frequently combine nutrition education, exercise, behavioural counselling and follow-up, with improvements in glucose-related outcomes reported across several studies (Community-based interventions for prevention of Type 2 diabetes, 2018).

Physical activity interventions also demonstrate potential for sustained behavioural improvement. Community cardiovascular prevention interventions have increased the probability of achieving recommended physical activity levels, including during longer follow-up periods (Community-based cardiovascular disease prevention interventions, 2021).

Smoking cessation represents another area in which community health workers and nurses can have a substantial role. Community health worker involvement has been associated with higher cessation rates, suggesting that cessation support should not be limited to specialist clinics (Community health workers involvement in smoking cessation programme, 2020).

Cancer screening illustrates another important dimension of prevention. Community health worker interventions can improve screening uptake, particularly among underserved populations (Okasako-Schmucker et al., 2023).

Taken together, these findings indicate that community nurses can contribute across the entire NCD prevention pathway.

The role of the community nurse should therefore be conceptualised as a combination of educator, risk assessor, counsellor, care coordinator, advocate and follow-up provider.

However, effectiveness depends heavily on health-system support. Training without supervision is insufficient. Screening without referral is incomplete. Education without follow-up is unlikely to generate sustained behaviour change. Consequently, successful programmes require organisational infrastructure in addition to individual nursing competence.

Overall Evidence Synthesis

The reviewed evidence can be summarised as follows:

Strongly supported areas

- community-based cardiovascular risk reduction;
- blood pressure improvement;
- cancer screening uptake;
- physical activity promotion;
- community health worker-supported tobacco cessation.

Moderately supported areas

- diabetes prevention;
- weight management;
- lipid improvement;
- glucose reduction;
- health literacy improvement;
- home-based follow-up.

Emerging areas

- digitally supported nurse-led prevention;
- remote monitoring;
- hybrid face-to-face/digital programmes;
- large-scale implementation in LMICs;
- economic evaluation of nurse-led NCD prevention.

26. Conclusion:

Non-communicable diseases represent a major and continuing global health challenge, but a substantial proportion of NCD risk is modifiable. Community health nurses have an important role in translating population-level prevention policies into practical interventions for individuals, families and communities.

The evidence reviewed in this article indicates that community health nurse-led and community health worker-supported interventions can improve important NCD risk factors and preventive behaviours. These interventions can reduce blood pressure, improve lipid and glucose profiles, support weight management, increase physical activity, facilitate tobacco cessation and improve cancer screening participation.

The strongest interventions are generally multicomponent and include repeated contact, behavioural counselling, screening, referral, family involvement and follow-up. Community nursing is especially valuable in underserved populations because it can bring preventive services closer to households and reduce barriers

to conventional facility-based healthcare.

The future of community NCD prevention should therefore move towards integrated, culturally appropriate and multidisciplinary models. Community nurses should be supported through standardised protocols, training, supervision, digital tools, referral systems and adequate resources.

Ultimately, community health nurse-led health promotion should not be regarded as an additional service but as a core component of primary healthcare and NCD prevention. By identifying risk early, supporting healthy behaviours and maintaining continuity between communities and healthcare facilities, community nurses can contribute substantially to reducing the future burden of preventable non-communicable diseases.

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