

Disease Prevention in Primary Health Care: Integrating Theory and Real-World Practice

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Abstract

Primary health care (PHC) is the foundation of effective disease prevention, integrating health promotion, early detection, treatment, rehabilitation, and community-based care. Despite strong theoretical support, translating preventive strategies into routine PHC practices remains challenging, particularly in low- and middle-income countries (LMICs). This article aims to synthesize contemporary evidence on the role of PHC in disease prevention by integrating theoretical frameworks with real-world implementation and by identifying key barriers, facilitators, and strategies for strengthening preventive care. A narrative review of 14 eligible publications (from 2020 to 2026) was conducted using evidence from original research, systematic reviews, scoping reviews, and World Health Organization (WHO) policy documents. Literature was identified through PubMed, Scopus, Google Scholar, and reference list searches. Evidence was synthesized thematically according to the five levels of prevention. Community-based health literacy interventions and lifestyle programs significantly improved preventive behaviors, while community health workers enhanced screening and linkage to care. However, implementation gaps persisted: limited adoption of WHO-recommended “best buy” interventions, low screening-to-treatment linkage (37.5%), workforce shortages, medicine stockouts, fragmented health information systems, and sociocultural barriers. Integrated human immunodeficiency virus (HIV)–noncommunicable disease (NCD) care models showed stronger HIV retention (>80%) vs. NCD retention (70–78%) outcomes, highlighting inequities in integrated care. Digital health technologies and multidisciplinary, community-oriented approaches emerged as key facilitators. PHC remains an effective platform for comprehensive disease prevention. Strengthening preventive services requires sustained investment in workforce capacity, community engagement, digital health, financing, and integrated health systems.

Keywords: Disease Prevention, Health Promotion, Primary Health Care

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Introduction

Primary health care (PHC) is widely recognized as the foundation of effective, equitable, and sustainable health systems. Since the Declaration of Alma-Ata (1978) and its reaffirmation through the Declaration of Astana (2018), PHC has evolved from a service delivery model into a comprehensive strategy for improving population health, advancing universal health coverage and addressing health inequities [1,2]. By integrating health promotion, disease prevention, treatment, rehabilitation, and palliative care, PHC provides continuous, people-centered care while addressing the social, environmental, and behavioral determinants of health.

Disease prevention within PHC encompasses interventions that reduce disease incidence, delay progression, minimize complications, and improve quality of life across the life course [3]. Within the framework of the natural history of disease, prevention extends beyond the prevention of disease onset to include early detection, effective disease management, rehabilitation, and the avoidance of unnecessary medical intervention. This broader perspective underpins the five levels of prevention discussed in this review: primordial, primary, secondary, tertiary, and quaternary prevention [3,4].

The global burden of noncommunicable diseases (NCDs) continues to increase, accounting for 74% of all deaths worldwide, with a disproportionate impact on low- and middle-income countries (LMICs) [5]. At the same time, many health systems face the “dual challenge” of managing chronic diseases while responding to emerging infectious diseases, population ageing, and widening health inequities [6,7]. In addition, healthcare expenditure is increasing and contributes to the insecurity of health care finance [8,9]. These trends underscore the urgent need to strengthen disease prevention within PHC systems.

In practice, PHC operationalizes disease prevention through health promotion, immunization, screening, lifestyle counselling, risk-factor management, and chronic condition management [10,11]. Recent advances in digital health, electronic health records, telemedicine and population health management have expanded opportunities to strengthen preventive care delivery [1]. However, limited financial resources, workforce shortages, fragmented healthcare systems, inadequate preventive infrastructure, and persistent health inequities constrain the effectiveness of prevention programs, particularly in LMICs [12,13].

This narrative review synthesizes contemporary evidence on disease prevention within PHC by examining the theoretical foundations, reviewing PHC-based preventive interventions, and discussing strategies. By integrating classical concepts with current evidence, this review aims to bridge theory and practice and provide practical recommendations for clinicians, healthcare professionals, health educators, researchers, and policymakers.

Methods

Literature Search

This review synthesizes current evidence on disease prevention in PHC, emphasizing integration of theoretical concepts with practical application across diverse healthcare settings. The review provides a broad overview rather than a formal systematic evaluation of intervention effectiveness.

Relevant literature was identified through electronic searches of PubMed, Scopus, and Google Scholar. Additional references were identified from reference lists of key articles and policy documents published by international organizations, particularly the World Health Organization (WHO). Search terms included primary health care, disease prevention, health promotion, preventive medicine, levels of prevention, primordial prevention, primary prevention, secondary prevention, tertiary prevention, quaternary prevention, community health, and family medicine.

Priority was given to peer-reviewed original articles, systematic reviews, clinical guidelines, and international policy documents published in English, with particular emphasis on recent evidence. Literature published from 2020 to June 2026 was considered. Seminal publications describing the conceptual development of disease prevention, including the work of Leavell and Clark and key WHO declarations, were included to provide historical context and theoretical foundations [14,15]. Exclusion criteria were as follows: 1) non-English articles; 2) editorials, commentaries, letters to the editor, and conference abstracts without full peer-reviewed data; 3) studies not addressing disease prevention or PHC contexts; and 4) articles with unavailable full text. No formal quality threshold was applied given the narrative nature of this review; however, preference was given to sources with clear methodological reporting and recognized indexing.

The initial search yielded 312 records from PubMed ($n = 148$), Scopus ($n = 97$), and Google Scholar ($n = 67$). After removal of duplicates ($n = 54$), 258 records remained for title and abstract screening. Of these, 201 records were excluded based on the exclusion criteria. The remaining 57 full-text articles were assessed for eligibility, and 43 were excluded for reasons including non-PHC focus ($n = 19$), lack of prevention-specific outcomes ($n = 14$), and insufficient methodological detail ($n = 10$). Fourteen publications were ultimately included in the narrative synthesis. Reference list searches of key articles and WHO policy documents yielded 6 additional sources used for theoretical and contextual grounding (not counted among 14 included studies).

Data Synthesis

The retrieved literature was synthesized narratively by organizing evidence into major themes: roles of PHC in disease prevention, levels of prevention, preventive interventions, implementation, strategies, and future challenges. Each included study was coded into one or more of the five levels of prevention (primordial, primary, secondary, tertiary, quaternary) based on the study's primary focus and outcomes.

The synthesis focused on identifying recurring concepts, comparing findings across healthcare settings, and highlighting implications for clinical practice, health systems, and policy. As a narrative review, study selection was based on relevance to review objectives rather than predefined systematic review protocols; therefore, the review should be interpreted as a comprehensive thematic synthesis rather than an exhaustive appraisal of all available evidence.

Results

Characteristics of included studies

To provide an overview of evidence base, Table 1 summarizes the 14 included studies examining disease prevention in PHC settings. The studies span multiple countries across South America, Southeast Asia, Sub-Saharan Africa, the Middle East, and Europe, encompassing diverse

study designs including randomized controlled trials, cohort studies, qualitative studies, scoping reviews, and mixed-methods evaluations.

Table 1 Characteristics and key findings of the included studies

Author (year of publication)	Country	Study design	Sample size	Focus area	Key findings
Rawal et al. (2020) [16]	Nepal	Qualitative study	35 CHWs	CHW role in NCD prevention	CHWs deliver screening, diagnosis, health education, basic medication; barriers: inadequate training, high workload, poor system support, irregular medicine support
Pakhare et al. (2021) [17]	India	Community-based cohort	6,174 screened; 1,451 high-risk	CVD screening & linkage to PHC	37.5% linked to public PHC; 34.9% never linked; predictors: young age, low wealth, distance, late CHW engagement
Tesema et al. (2021) [18]	Ethiopia	Qualitative study	22 individuals	Health system capacity for integrated NCD services	Only 46% of facilities ready for diabetes; 34% for CVD; critical gaps in political commitment; governance, workforce, HMIS, medicines
Baatiema et al. (2024) [19]	Ghana	Mixed methods	36 participants	Implementation of WHO-recommended “best buys”	Implementation scores: 2015: 5.0/19; 2017: 9.0/19; 2020: 5.0/19; 2022: 5.5/19 (mean: 6.1/19)
Millones et al. (2024) [20]	Peru	Pilot implementation	1,000 adults	Integrated TB-NCD screening	Linkage cascade (93%), hypertension (81%), diabetes (71%), depression (69%) ; 59% initiated treatment
Santo et al. (2024) [21]	Brazil	Cross-sectional	415,766 participants	Statin use for CVD prevention	2.6% statin use; 0.1% high-intensity therapy; 95.8% sedentary; 8.3% active smokers
Wongkongdech et al. (2024) [6]	Thailand	Mixed methods; Plan-Do-Check-Act framework	105 DRGs; 43 stakeholders	Health literacy promotion for diabetes prevention	Health literacy improved, prevention practices improved
Eltigany et al. (2025) [22]	Multiple LMICs	Scoping review	44 models	NCD care models in PHC	Key elements: workforce training, self-management, team-based care, screening, guideline, task-shifting

Table 1 (Continued)

Author (year of publication)	Country	Study design	Sample size	Focus area	Key findings
Febriyanti et al. (2025) [23]	Indonesia	Scoping review	38 articles	Prolanis chronic disease program	Five barriers categories: infrastructure/staffing, low coverage/adherence, socioeconomic/cost. Cultural/health literacy, pandemic disruption
Gupta et al. (2025) [24]	Multiple LMICs	Scoping review	175 articles	Health workforce for NCDs	71% highlighted multidisciplinary team roles; most evidence from upper-middle-income countries (59%); scarce evidence from LICs (3%)
Jelyani et al. (2025) [25]	Iran	Qualitative study	18 health care workers	Barriers to NCD engagement	People-level: prioritization of treatment over prevention, economic difficulties; organizational: inadequate specialized services, single-shift operation, workforce burnout
Johnsson et al. (2025) [26]	Sweden	Randomized controlled trial	122 participants	Stroke prevention via lifestyle intervention	Reduced stroke risk
Mali et al. (2025) [27]	Nepal	Qualitative study	35 participants	Barriers/facilitators to NCD service utilization	Facilitators: free medicines, proximity, positive provider interaction family support; barriers: medicine stockouts, distance, poor counselling, no reminders
Suwanbamrung et al. (2026) [7]	Multiple SSA	Systematic review	16 studies	Integrated HIV-NCD care models	HIV retention >80%, viral suppression >90%; NCD retention 70–78%; BP control <50–60% of targets; “HIV-first” pathway creates inequity

Abbreviations: CHW: community health worker; CVD: cardiovascular disease; DRG: Diagnosis Related Group; HIV: human immunodeficiency virus; HMIS: Health Management Information System; LMIC: low- and middle-income country; NCD: noncommunicable disease; PHC: primary health care; SSA: Sub-Saharan Africa; TB: tuberculosis; WHO: World Health Organization

Roles of Primary Health Care in Disease Prevention

PHC serves as the principal platform for disease prevention by integrating preventive services into routine healthcare delivery throughout the life course. Unlike disease-specific programs, PHC provides comprehensive and continuous care that enables the health promotion, early detection, treatment, rehabilitation, and long-term follow-up within the same healthcare system [1]. This integrated approach allows preventive interventions to be delivered consistently while responding to the changing health needs of individuals and communities.

The effectiveness of PHC in disease prevention is supported by its core attributes: first-contact access, continuity of care, comprehensiveness, and care coordination [28]. These characteristics facilitate the early identification of health risks, timely implementation of preventive interventions, and ongoing management of chronic conditions. Long-term relationships between healthcare providers and patients also promote adherence to preventive recommendations, improve self-management, and support sustained behavioral change [29,30].

Disease prevention within PHC extends beyond clinical care by addressing the social and environmental determinants of health. Factors such as education, income, housing, nutrition, employment, and environmental conditions substantially influence disease risk and health outcomes [5]. Consequently, effective PHC requires collaboration among healthcare providers, public health agencies, local governments, schools, and community organizations to create supportive environments that promote healthy behaviors and reduce preventable risk factors.

Community participation is another defining principle of PHC. Community health workers, nurses, family physicians, pharmacists, and other multidisciplinary team members contribute to disease prevention through health education, immunization programs, screening services, lifestyle counselling, and chronic diseases management [31,32].

PHC can leverage existing infrastructure and programs to expand preventive services. The integration of NCD services into human immunodeficiency virus (HIV) care platforms in Sub-Saharan Africa demonstrates how established HIV infrastructure can be leveraged to deliver diabetes and hypertension care [7]. However, this approach risks creating “HIV-first” integration pathway where HIV services consistently outperform NCD services in terms of retention, monitoring, and continuity. This underscores the need for deliberate strengthening of NCD-specific components within integrated models.

Levels of Prevention in Primary Health Care

The concept of the levels of prevention provides a systematic framework for organizing preventive interventions across the natural history of disease. Originally described by Leavell and Clark, the framework includes primordial, primary, secondary, and tertiary prevention with quaternary prevention later introduced to address overmedicalization and unnecessary healthcare interventions [4,14]. Within PHC, these prevention levels are complementary rather than sequential, enabling healthcare providers to reduce disease risk, detect illness early, minimize complications, and protect patients from avoidable harm [3,4].

Primordial Prevention: Preventing from the Roots

Primordial prevention targets the underlying social, economic, environmental, and commercial determinants that give rise to disease risk factors at the population level. Unlike primary prevention,

which focuses on reducing established risk factors in individuals, primordial prevention aims to prevent the development of these risk factors altogether [14]. This approach addresses the “causes of the causes”—the structural conditions that shape lifestyle choices, environmental exposures, and access to health-promoting resources [5].

The implementation of primordial prevention is underscored by evidence that atherosclerotic cardiovascular disease begins in childhood, with risk factors originating during perinatal, childhood, and adolescent stages [33]. Modifiable lifestyle factors, particularly healthy weight, physical activity, dietary quality, and alcohol moderation, are substantially associated with prevention of hypertension, with early-onset hypertension showing the strongest association [32].

Effective primordial prevention requires interventions at the policy and social structure level, extending beyond the health sector. These include fiscal policies (e.g., taxation on tobacco, alcohol, sugar-sweetened beverages), regulatory measures (e.g., smoke-free public spaces, advertising bans, front-of-pack labelling), and structural interventions (e.g., urban planning promoting physical activity and access to nutritious foods) [5,19]. These population-level approaches are among the WHO-recommended “best buys” for NCD prevention, offering high cost-effectiveness [34].

Although primordial prevention is traditionally viewed as a public health function, PHC can contribute through community health needs assessment, multi-sectoral collaborations, health literacy programs [6], and surveillance systems monitoring population-level risk factors [5].

Primary Prevention: Reducing Risk Factors

The included studies demonstrated that PHC provides an important platform for population-level and individual disease prevention through health promotion, lifestyle modification, health literacy, and risk-factor reduction. Evidence from Thailand showed that a participatory health-literacy intervention among people at risk of diabetes significantly improved both health literacy and diabetes-prevention practices [6]. The intervention emphasized healthy eating, physical activity, emotional management, smoking cessation, and reduction of alcohol consumption, with community participation and continuous monitoring. Similarly, a randomized controlled trial in Sweden demonstrated that a lifestyle intervention delivered through PHC contributed to stroke-risk reduction by incorporating engaging everyday activities into prevention care [26]. Policy-level interventions such as WHO-recommended “best buys” have shown potential population-wide risk reduction, though implementation remains inconsistent [19]. These findings indicate that evidence-based prevention interventions are available, but their population-level impact depends strongly on political commitment, sustained implementation, and adaptation to sociocultural contexts.

Secondary Prevention: Screening and Early Detection

Secondary prevention through screening was feasible within community-based PHC programs, but substantial gaps remained between identification of individuals at risk and initiation of appropriate care. In India, community health worker (CHW)-supported screening identified a substantial proportion of adults at high cardiovascular risk; however, fewer than 40% of those identified were subsequently linked to public PHC facilities. Non-linkage was associated with younger age, lower socioeconomic status, greater distance from health facilities, and late engagement with CHWs [17].

Early detection extends beyond initial screening to include timely diagnostic confirmation and risk stratification. Evidence from Brazil demonstrated that among a large population

receiving primary care, statin use for primary prevention was low (2.6%), and high-intensity lipid-lowering therapy was particularly uncommon (0.1%), indicating missed opportunities for early risk modification even after patients were engaged in care [21]. This suggests that early detection systems must be coupled with clinical decision support and systematic follow-up to translate screening results into preventive action.

Integrated screening approaches may improve linkage across multiple conditions. In Peru, a mobile, community-based model integrating screening for tuberculosis, hypertension, diabetes, and depression achieved relatively high linkage rates, although treatment initiation remained incomplete [20]. These findings suggest that screening alone is insufficient; effective secondary prevention requires accessible referral pathways, patient navigation, follow-up, and timely treatment initiation. The contrast between high screening uptake and low treatment initiation across these settings highlights a consistent “linkage gap” that must be addressed through system-level solutions, including integrated care pathways, electronic reminders, and community-based follow-up. Evidence from Brazil further demonstrated missed opportunities for cardiovascular prevention within PHC. Among the large population receiving primary care, statin use was low, and high-intensity lipid-lowering therapy was particularly uncommon among a large population in primary care [17,21].

Tertiary Prevention: Preventing Complications and Comorbidities

Evidence indicated that chronic disease prevention and management require organized, multidisciplinary, and continuous PHC services. A scoping review of NCD care models in LMICs identified workforce training, team-based care, patient self-management, screening, guideline-based practices, and task-shifting as important components of effective PHC models [22]. However, implementation of comprehensive chronic disease programs remained constrained by workforce shortages, inconsistent medicine supplies, geographical barriers, and financial costs. In Indonesia, the Prolanis program incorporated consultations, medication refills, health education, laboratory tests, home visits, reminders, and group exercise; however, implementation challenges limited its effectiveness [23].

Integration of NCD services into established HIV programs represents another approach to expand chronic care in resource-constrained settings. A systematic review from Sub-Saharan Africa found that integrated HIV-NCD models achieved strong HIV outcomes, with HIV retention exceeding 80% and viral suppression exceeding 90%. However, NCD retention was lower (70-78%), and blood pressure and glycemic control remained inconsistent (<50-60% of targets) [7]. This disparity reflects an “HIV-first” integration pathway, where HIV services benefit from established infrastructure, dedicated funding, and historical programmatic priority, while NCD components receive comparatively less attention and resources. This effectively creates a two-tier system within integrated care models. More fully integrated chronic-care models with balanced attention to all conditions appeared to produce more equitable outcomes, although they were less frequently evaluated.

Quaternary Prevention: Avoid Overmedicalization

Quaternary prevention, defined as protecting patients from unnecessary or potentially harmful medical interventions, represents an increasingly important dimension of PHC-based prevention [4]. As diagnostic technologies and screening programs expanded, healthcare professionals

face growing risks of overdiagnosis, overtreatment, and polypharmacy. Evidence from Iran identified organizational barriers including inadequate specialized services, single-shift operations, and workforce burnout that may contribute to fragmented, intervention-heavy care rather than thoughtful, patient-centered prevention [25]. Quaternary prevention emphasizes evidence-based decision-making, shared decision-making, and avoidance of interventions whose potential harm outweighs expected benefits. Incorporating these perspectives ensures that preventive care remains both effective and ethically responsible, particularly as PHC systems in LMICs adopt increasingly complex screening and treatment protocols. For instance, non-evidence based or overutilized tests for screening among low-risk populations may lead to further unnecessary investigations.

Strategies for Strengthening Disease Prevention in Primary Health Care

Strengthening the Primary Health Care Workforce

Although effective preventive interventions are well established, their implementation remains inconsistent because of limited resources, workforce shortages, fragmented service delivery, and persistent social inequities. Addressing these barriers is essential for improving the accessibility, quality, and sustainability of preventive care [5]. Evidence from Nepal indicates CHWs require additional training and system support to deliver NCD services effectively [16]. Leadership development for preventive health programs at district and facility levels is also needed to ensure sustained implementation.

Evidence from a scoping review of health workers delivering NCD care in LMICs emphasized the importance of multidisciplinary team roles, with 71% of the included literature highlighting the contribution of multidisciplinary team [24]. However, the evidence was concentrated in upper-middle-income countries, while the only a small proportion originated from low-income countries, indicating an important evidence gap in resource-constrained settings. Key workforce strategies therefore include pre-service and in-service training in preventive medicine, interprofessional education, task-shifting between health professionals and community health workers, continuing professional development, and leadership development for preventive health programs [16,18]. These strategies must be accompanied by systematic support, including adequate supervision, remuneration, and integration into formal health systems, to ensure sustainability [16].

Ensuring Essential Medicines, Equipment and Sustained Financing

Medicine stockouts were consistently identified as a barrier to effective prevention and chronic disease management across multiple settings [16,21]. In Ethiopia, only 46% of facilities were ready for diabetes care and 34% for cardiovascular disease care, with critical gaps in medicine supply chain management systems, implementing essential medicines lists at PHC level, establishing reliable procurement mechanism, and exploring public-private partnership for medicine distribution [18]. Similarly, patients in Nepal reported medicine stockouts, distance to facilities, poor counselling, and lack of reminders as barriers to NCD service utilization [27]. Adequate and sustained financing for preventive services is equally critical, including dedicated budget allocations for NCD prevention, performance-based financing mechanism, and integration of prevention into health insurance benefits packages.

Strengthening Community Engagement and Health Literacy

Community participation is fundamental to effective PHC-based prevention. Strategies include community health needs assessments involving community members; community health committees for program governance; health literacy programs enabling informed decision-making; community-based health workers bridging PHC and community settings; and partnerships with community organizations for health promotion activities [6,16]. Evidence from Thailand demonstrates that genuine community participation and active involvement in planning and decision-making fostered ownership and commitment to program success [6].

Digital Health and Integrated Care

Digital health technologies offer opportunities to enhance PHC-based prevention. Strategies include systematic risk assessment integrated into electronic health records; clinical decision support for evidence-based preventive care; population health management tools for risk stratification; patient portals and mobile application for self-management; and telemedicine for remote preventive care access [21]. In Brazil, a digital health platform enabled large-scale real-world evidence generation on statin use in primary prevention, identifying significant underutilization of guideline-recommended therapy [21]. Digital approaches should be considered complementary rather than standalone solutions. Their effectiveness depends on adequate infrastructure, digital literacy, workforce capacity, data governance, and equitable access.

Overall, strengthening disease prevention in PHC requires an integrated approach that combines clinical excellence, community participation, digital innovation, and supportive public policy. Such investments not only improve individuals' health outcomes but also enhance health system efficiency and contribute to the achievement of universal health coverage.

Discussion

Principal Findings

This review synthesizes evidence from diverse settings and demonstrates that PHC provides an effective platform for disease management across all five levels of prevention. Key findings indicate that community-based health literacy interventions, CHW-supported screening, and integrated care models can significantly improve preventive behaviors and clinical outcomes. However, persistent implementation gaps remain, particularly in LMICs, where workforce shortages, medicine stockouts, fragmented health information systems, and sociocultural barriers constrain effectiveness.

Theoretical and Practical Integration

The findings reinforce the continued relevance of Leavell and Clark's levels of prevention framework, while highlighting the need for greater attention to quaternary prevention in contemporary PHC. As diagnostic technologies and screening programs expanded, healthcare professionals face increasing risks of overdiagnosis, overtreatment, and polypharmacy. Quaternary prevention: protecting individuals from unnecessary medical intervention, requires evidence-based decision-making, shared decision-making, and careful considerations of harms versus benefits [4]. Incorporating this perspective ensures that preventive care remains both effective and ethically responsible, particularly as PHC systems in LMICs adopt increasingly complex protocols.

Implementation Gaps and Equity Concerns

The “HIV-first” integration pathway identified in Sub-Saharan Africa represents a concerning equity issue as a case study. While HIV programs have benefited from decades of dedicated funding and infrastructure, NCD services in integrated models often remain secondary, with weaker retention, monitoring, and outcomes [7]. This suggests that partial integration may unintentionally perpetuate disease-specific hierarchies rather than achieving truly comprehensive chronic care. Fully integrated models with balanced investment across conditions, though less frequently evaluated, appear to produce more equitable outcomes and should be prioritized in future program design.

The persistent gap between screening and treatment linkage (37.5% in India) underscores that secondary prevention requires more than identification of at-risk individuals [17]. Furthermore, inequities in early-detection quality compound these linkage failures: populations with lower socioeconomic status and greater distance from facilities are not only less likely to be linked to care but also less likely to receive timely diagnostic confirmation and risk stratification, thereby widening existing disparities in preventable disease outcomes [17,21]. Accessible referral pathways, patient navigation, follow-up systems, and timely treatment initiation are essential components that are often under-resourced [19].

Digital Transformation and Future Directions

Digital health technologies offer opportunities to strengthen prevention through improved risk stratification, continuity of care, and patient engagement. However, technology alone cannot improve preventive care. Its effectiveness depends on integration with PHC, workforce training, digital literacy, appropriate governance, and equitable access to avoid widening existing health disparities [26]. The Brazil example demonstrates how digitally enabled PHC systems can identify underuse of guideline-recommended therapies at population scale [21].

Limitations

This narrative review has several limitations. It does not employ a systematic search, study selection, or formal quality appraisal methods used in systematic review. The literature included reflects the scope and objectives of the review rather than an exhaustive synthesis of all available evidence. However, integrating policy perspectives, this review provides a comprehensive overview of disease prevention in PHC and identifies practical considerations for strengthening preventive care across diverse settings.

Conclusion

PHC has the potential to provide an effective platform for integrating disease prevention across the continuum of care. By combining the five levels of prevention with comprehensive, person-centered, and community-oriented services, PHC can reduce disease burden, improve population health, and contribute to equitable and resilient health systems. The evidence demonstrates that PHC-based prevention programs can be effective, with significant improvements in health literacy, prevention practices, and clinical outcomes. However, implementation faces persistent challenges: workforce shortages, medicine stockouts, fragmented health information systems, sociocultural barriers, and financial constraints. Key facilitators include community health workers, affordable services, family and peer support, and positive provider interactions.

Recommendations

For policymakers

Strengthen the availability of essential NCD medications, invest in human resources and infrastructure, address sociocultural barriers through culturally adapted health education, and ensure dedicated financing for prevention.

For researchers

Prioritize mixed-methods evaluations examining implementation processes, cost-effectiveness, and patient-reported outcomes across diverse settings, with particular attention to how integration affects equity and long-term clinical outcomes for all conditions.

For clinicians and educators

Integrate prevention training into undergraduate and continuing education, embrace team-based and patient-centered approaches, and incorporate quaternary prevention principles to avoid unnecessary interventions.

Use of Artificial Intelligence

The authors used ChatGPT (OpenAI, USA) for grammar checks and language refinement. The authors have reviewed and verified the accuracy of all output generated with AI assistance and take full responsibility for the entire content of this article.

Conflict of Interest

The authors declared no potential conflicts of interest.

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