World Journal of Biology Pharmacy and Health Sciences
eISSN: 2582-5542
Cross Ref DOI: 10.30574/wjbphs
Journal homepage: https://wjbphs.com/

(REVIEW ARTICLE)

Check for updates

Healthy aging in Vietnam: A review of health burden, functional decline, and nursing care implications in older adults

Thi-Cham Bui and Thi-Quynh-Trang Nguyen *

Phenikaa School of Medicine and Pharmacy, Phenikaa University, Hanoi, Vietnam.

World Journal of Biology Pharmacy and Health Sciences, 2026, 26(02), 013-022

Publication history: Received on 23 March 2026; revised on 02 May 2026; accepted on 04 May 2026

Article DOI: https://doi.org/10.30574/wjbphs.2026.26.2.0233

Abstract

Background: Population aging has become one of the most significant demographic transitions worldwide, with major implications for health systems, long-term care, and nursing practice. Vietnam is among the fastest-aging countries in Asia, with rapid increases in life expectancy and the proportion of adults aged 60 years and older. This demographic transition has been accompanied by a growing burden of chronic diseases, functional decline, frailty, and dependence in activities of daily living. Understanding the multidimensional health burden of older adults is essential for designing age-friendly health systems and strengthening geriatric nursing care. This review aimed to synthesize current evidence on healthy aging in Vietnam, focusing on disease burden, functional decline, healthcare utilization, and implications for nursing practice.

Methods: A narrative review was conducted using peer-reviewed literature from PubMed, Google Scholar, World Health Organization, Global Burden of Disease databases, and official Vietnamese health statistics. Studies published between 2000 and 2025 were searched using keywords including "older adults", "healthy aging", "frailty", "functional decline", "geriatric nursing", and "Vietnam". Eligible studies included epidemiological studies, systematic reviews, national surveys, and international reports focusing on health conditions and aging-related outcomes in Vietnam.

Results: Evidence indicates that Vietnam's aging population is increasing rapidly, with older adults experiencing high prevalence of hypertension, diabetes, stroke, frailty, depression, cognitive decline, and mobility limitations. Functional impairment, polypharmacy, and increasing dependence on family caregivers represent major healthcare challenges. Rural–urban disparities and limitations in long-term care systems further complicate healthy aging. Nursing care plays a critical role in chronic disease management, functional assessment, fall prevention, caregiver education, and community-based elderly care.

Conclusions: Healthy aging in Vietnam requires integrated healthcare strategies that combine disease prevention, functional preservation, and long-term supportive care. Strengthening geriatric nursing capacity and expanding community-based elderly care services are essential for improving health outcomes and quality of life among older adults.

Keywords: Healthy aging; Older adults; Vietnam; Frailty; Functional decline; Geriatric nursing Cardiovascular disease

1. Introduction

Population aging is one of the most important demographic changes of the 21st century. According to the World Health Organization, the global population aged 60 years and older is expected to double from 1 billion in 2020 to 2.1 billion by 2050 (1). Aging is associated with increased risks of chronic diseases, functional dependence, disability, and higher

* Corresponding author: Thi-Quynh-Trang Nguyen, Email: trang.nguyenthiquynh@phenikaa-uni.edu.vn

healthcare utilization. Consequently, healthy aging has become a central priority in public health and healthcare systems worldwide. The WHO defines healthy aging as the process of developing and maintaining the functional ability that enables well-being in older age (2). This concept extends beyond disease absence and emphasizes capacity, autonomy, mobility, cognitive function, and social participation. In nursing science, healthy aging is particularly relevant because nurses are directly involved in health promotion, chronic disease management, rehabilitation, and long-term care.

Vietnam is undergoing one of the fastest demographic transitions in Southeast Asia. According to the General Statistics Office of Vietnam, the proportion of older adults aged 60 years and above has increased substantially over the last two decades, driven by declining fertility rates and improved life expectancy (3). National demographic projections suggest that Vietnam will officially become an "aged society" by 2036, earlier than many neighboring countries (4). This rapid transition creates substantial pressure on healthcare systems, social support systems, and long-term care infrastructure. Life expectancy in Vietnam has increased significantly, reaching approximately 73.7 years in recent years (5). However, healthy life expectancy remains lower, indicating that many Vietnamese older adults live with chronic illness, disability, or dependence during later life (6). This gap between life expectancy and healthy life expectancy highlights the importance of preventive care and functional health maintenance. Older adults in Vietnam face a high burden of non-communicable diseases (NCDs), including hypertension, diabetes, cardiovascular diseases, chronic respiratory diseases, and cancer. The Global Burden of Disease study has consistently shown that NCDs account for the majority of mortality and disability among older adults in Vietnam (7,8). Hypertension remains the most prevalent chronic condition and is strongly associated with stroke, heart failure, and chronic kidney disease (9).

Frailty has emerged as an important geriatric syndrome associated with adverse outcomes such as hospitalization, falls, disability, and mortality. Frailty prevalence among community-dwelling older adults in Asia ranges from 5% to 27%, and evidence suggests increasing prevalence in Vietnam (10). Frailty reflects reduced physiological reserve and vulnerability to stressors, making it a critical target for nursing interventions. Functional decline is another major challenge in healthy aging. Limitations in activities of daily living (ADL) and instrumental activities of daily living (IADL) significantly affect independence and quality of life. Studies in Vietnam have reported increasing functional limitations among older adults, particularly those with multimorbidity (11). Functional decline often increases caregiver burden and healthcare dependence. Mental health conditions, particularly depression and dementia, also contribute significantly to the aging burden. Depression among older adults is associated with social isolation, chronic disease burden, and reduced quality of life (12). Meanwhile, dementia prevalence is increasing due to population aging, creating long-term care demands that challenge family-based care systems (13). Traditional family-centered elderly care remains dominant in Vietnam. However, rapid urbanization, migration, and changing family structures have weakened traditional caregiving systems (14). Older adults increasingly face social isolation and reduced informal support, especially in urban environments. Nurses play essential roles in promoting healthy aging through comprehensive geriatric assessment, chronic disease management, fall prevention, rehabilitation support, caregiver education, and palliative care. In Vietnam, strengthening geriatric nursing capacity is increasingly recognized as a critical strategy for improving elderly health outcomes (15).

Despite increasing policy attention, evidence synthesis regarding healthy aging in Vietnam remains fragmented. Existing studies often focus on single diseases or isolated geriatric conditions rather than comprehensive aging-related health burdens. Therefore, this review aims to synthesize available evidence on health burden, functional decline, and nursing implications for healthy aging in Vietnam.

2. Data used and Methods

2.1. Data sources

This review synthesized evidence from multiple scientific and institutional databases, including: PubMed, Google Scholar, World Health Organization, Institute for Health Metrics and Evaluation (GBD database), General Statistics Office of Vietnam, Ministry of Health (Vietnam). Only publications published between 2000 and 2025 were considered to capture contemporary evidence on aging and elderly health in Vietnam.

2.2. Methods

A narrative review approach was used to synthesize current evidence on healthy aging among older adults in Vietnam. Literature searches were conducted in PubMed, Google Scholar, World Health Organization, the Global Burden of Disease database, and official reports from the Ministry of Health (Vietnam) and the General Statistics Office of Vietnam. Search terms included combinations of "healthy aging", "older adults", "frailty", "functional decline", "activities of daily living", "geriatric nursing", and "Vietnam". Studies published between 2000 and 2025 were screened and included if

they focused on Vietnamese adults aged 60 years and older and reported epidemiological, functional, mental health, or healthcare utilization outcomes. Eligible sources included peer-reviewed original studies, systematic reviews, and official national or international reports. Editorials, commentaries, conference abstracts, and studies lacking sufficient methodological information were excluded. The findings were synthesized into four thematic domains: demographic and epidemiological aging trends, disease burden, functional decline and disability, and nursing care implications for healthy aging.

3. Results and discussion

3.1. Epidemiological profile of population aging in Vietnam

Vietnam is experiencing one of the fastest demographic aging transitions in Asia. According to the General Statistics Office of Vietnam, the proportion of people aged 60 years and older increased from 8.7% in 2009 to more than 12% in 2021, and is projected to exceed 20% by 2038, officially transitioning Vietnam into an aged society (14–16). This demographic shift has occurred over a much shorter period compared to high-income countries, creating substantial pressure on healthcare systems, social welfare programs, and family caregiving structures. Life expectancy in Vietnam has increased steadily over the past three decades, reaching approximately 73.7 years (Figure 1), reflecting improvements in healthcare access, vaccination coverage, maternal health, and infectious disease control (17). However, healthy life expectancy remains significantly lower than total life expectancy, suggesting that many older adults spend their later years living with chronic diseases, disability, or dependence (18). This "healthy life expectancy gap" represents a major challenge for healthy aging policy.

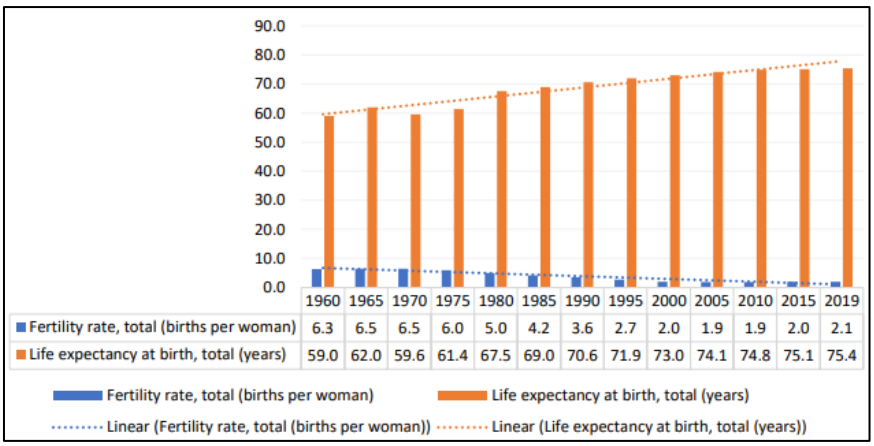

Figure 1 Fertility Rate and Life Expectancy in Vientam from 1960-2019 (17).

The aging dependency ratio has also risen significantly, meaning that the number of older adults relying on working-age populations is increasing rapidly (15). Traditional family-based support systems remain central in Vietnam, but changing family structures, internal migration, and urbanization have reduced caregiving availability. This creates increasing risks of unmet care needs, particularly among older adults living alone or in rural areas. Gender differences in aging patterns are also evident. Women generally have longer life expectancy than men but experience higher rates of disability, frailty, and chronic morbidity in later life (19). This reflects both biological aging processes and social determinants such as lower income security and greater lifetime caregiving burdens. Rural–urban disparities remain significant in elderly health outcomes. Older adults in rural areas often experience poorer healthcare access, lower income, and reduced social support, contributing to worse health outcomes compared to urban elderly populations (20). These inequalities highlight the need for equitable healthcare policies tailored to diverse aging populations.

Table 1 Demographic indicators of population aging in Vietnam

Indicator	2009	2021	Projection 2038	Trend	Citation
Population aged ≥60 years (%)	8.7	12.8	>20.0	Increasing	(14–16)
Life expectancy (years)	72.8	73.7	76.0	Increasing	(17)
Healthy life expectancy (years)	63.0	64.5	–	Moderate increase	(18)

Aging dependency ratio (%)	14.2	18.3	29.1	Increasing	(15,16,19)

Table 1 demonstrates the rapid demographic aging process in Vietnam, characterized by increasing longevity and a growing proportion of older adults. The widening gap between total life expectancy and healthy life expectancy suggests that many older adults live with prolonged morbidity and functional decline. The increasing dependency ratio further indicates rising caregiving and healthcare demands, emphasizing the urgent need for stronger geriatric healthcare systems and nursing support for healthy aging.

3.2. Major health burden among older adults in Vietnam

Non-communicable diseases (NCDs) account for the majority of disease burden among older adults in Vietnam. Hypertension remains the most prevalent chronic disease, affecting approximately 50–60% of adults aged 60 years and older (21–23). Hypertension significantly increases the risk of stroke, cardiovascular disease, chronic kidney disease, and mortality. Diabetes prevalence among older Vietnamese adults has increased substantially due to urbanization, sedentary lifestyles, and dietary changes (24,25). Older adults with diabetes often experience multimorbidity, increasing the complexity of clinical management and medication adherence. Stroke remains one of the leading causes of mortality and disability among older adults. The burden of stroke in Vietnam is particularly severe because of delayed diagnosis, inadequate hypertension control, and limited rehabilitation systems (26,27). Stroke-related disability significantly affects independence and quality of life.

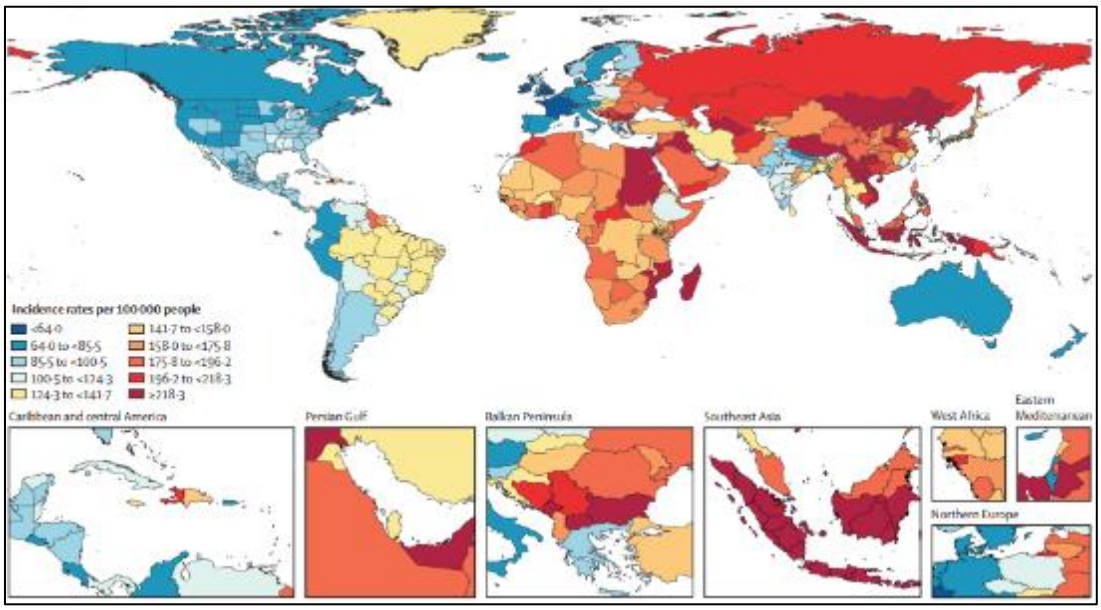

Figure 2 Stroke incidence rates per 100000 people by all stroke types and country, for both sexes, 2019 (27).

Frailty has emerged as a major geriatric syndrome in Vietnam. Frailty is characterized by reduced physiological reserve and increased vulnerability to stressors. Studies in Asia report frailty prevalence ranging from 10% to 27%, with increasing evidence of similar patterns in Vietnam (28). Frailty is strongly associated with falls, hospitalization, disability, and mortality. Cognitive impairment and dementia are also increasing. Population aging has led to substantial growth in dementia cases, creating major long-term care challenges for families and health systems (29). Dementia care remains underdeveloped in Vietnam, relying largely on informal family caregivers. Depression is another important but underrecognized health burden. Social isolation, chronic illness, bereavement, and reduced social participation contribute to depression among older adults (30). Untreated depression may worsen physical health outcomes and increase disability.

Table 2 highlights the complex disease burden among Vietnamese older adults, dominated by chronic diseases and geriatric syndromes. Hypertension remains the most prevalent condition and serves as a major upstream risk factor for severe cardiovascular outcomes. Frailty, dementia, and depression represent multidimensional challenges that extend beyond biomedical care, requiring integrated nursing assessment and long-term support strategies.

Table 2 Major cardiovascular risk factors in Vietnam.

Health condition	Estimated prevalence (%)	Major impact	Citation
Hypertension	50–60	Stroke, heart disease	(21–23)
Diabetes mellitus	15–20	Multimorbidity, disability	(24,25)
Stroke history	5–8	Functional dependence	(26,27)
Frailty	10–25	Falls, hospitalization	(28)
Dementia	5–7	Long-term care burden	(29)
Depression	15–30	Reduced quality of life	(30)

3.3. Functional decline and disability in older adults

Functional decline is one of the most important determinants of healthy aging because it directly affects independence and quality of life. Activities of daily living (ADL) and instrumental activities of daily living (IADL) are commonly used to assess functional ability among older adults (31). Vietnamese studies have shown increasing ADL limitations with age, particularly among adults aged 75 years and older. Functional dependence is strongly associated with multimorbidity, frailty, stroke history, and cognitive impairment (32).

Mobility limitation is another major issue. Reduced walking speed, muscle weakness, and sarcopenia significantly increase fall risk and disability (33). Falls are among the leading causes of injury and hospitalization among older adults. Polypharmacy contributes significantly to functional decline. Older adults with multiple chronic conditions often receive multiple medications, increasing risks of adverse drug events, falls, and poor treatment adherence (34). Social isolation and reduced social participation also contribute to functional deterioration. Older adults living alone or with limited family support often experience faster decline in physical and mental health (35). Functional decline has major implications for nursing care. Early identification of frailty, mobility problems, and ADL limitations can support timely interventions and improve long-term outcomes.

Table 3 Functional impairment indicators among older adults in Vietnam.

Functional indicator	Estimated prevalence (%)	Clinical implication	Citation
ADL limitation	15–25	Dependence in self-care	(31,32)
IADL limitation	25–40	Reduced independent living	(31,32)
Frailty	10–25	Increased vulnerability	(28,32)
Falls (annual)	15–20	Injury, hospitalization	(33,35)
Mobility limitation	20–35	Reduced quality of life	(32,33)
Polypharmacy	30–50	Adverse drug events	(34)

Table 3 demonstrates that functional decline among older adults in Vietnam is substantial and multifactorial. IADL limitations are generally more prevalent than ADL limitations, indicating early loss of independent living capacity before severe self-care dependence develops. Frailty, falls, and polypharmacy further increase vulnerability, emphasizing the need for comprehensive geriatric assessment and preventive nursing interventions.

3.4. Prevention strategies and public health implication

Healthcare utilization among older adults in Vietnam is increasing as a result of population aging, multimorbidity, and functional decline. Older adults frequently require repeated outpatient visits, long-term medication use, rehabilitation, and periodic hospitalization for chronic conditions such as hypertension, diabetes, stroke, chronic respiratory diseases, and musculoskeletal disorders (36–38). Evidence from national household data indicates that older Vietnamese adults often use multiple types of healthcare providers, including commune health stations, private clinics, private hospitals, and public hospitals; however, public hospitals remain the preferred provider for many older adults, even for regular health consultations (36). This pattern reflects both trust in higher-level hospitals and weaknesses in primary healthcare capacity for chronic disease management. Commune health stations are geographically accessible but may

have limited geriatric expertise, diagnostic capacity, and continuity-of-care systems. As a result, older adults may bypass local services and seek care directly at district, provincial, or central hospitals, contributing to overcrowding and increased financial burden (36,37).

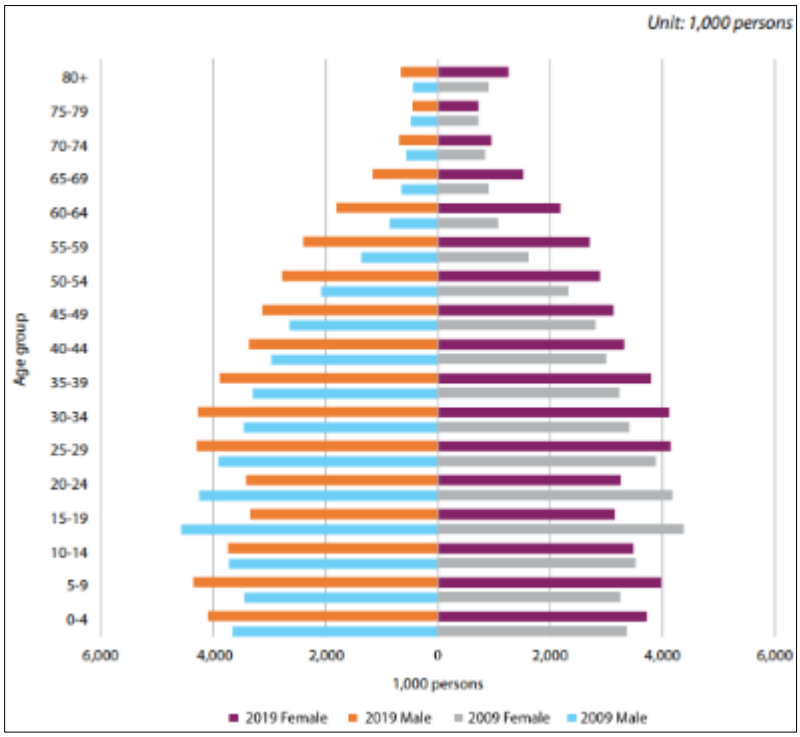

Figure 3 Viet Nam population pyramids in 2009 and 2019 (40).

Long-term care remains one of the most important gaps in Vietnam's aging response. Traditional care for older adults is largely family-based, supported by cultural expectations of filial responsibility. However, rapid urbanization, smaller family size, labor migration, and changing household structures have weakened the availability of informal caregivers (39–41). Older adults with dementia, stroke-related disability, frailty, or severe ADL limitations often require sustained assistance with bathing, dressing, mobility, medication management, nutrition, and emotional support. Family caregivers provide most daily care, but they often receive limited formal training. This may increase caregiver burden, reduce quality of care, and delay recognition of complications such as falls, pressure injuries, medication adverse effects, depression, and cognitive decline (39,42). Therefore, strengthening home-based and community-based long-term care is essential for healthy aging in Vietnam. From a nursing perspective, long-term care should not be viewed only as custodial care, but as a continuum of preventive, rehabilitative, supportive, and palliative services. Nurses can contribute by conducting comprehensive geriatric assessment, monitoring chronic diseases, educating caregivers, preventing falls, promoting medication safety, and coordinating referrals between community and hospital services. Building geriatric nursing capacity is therefore central to the development of an age-friendly healthcare system.

Table 4 Healthcare utilization and long-term care needs among older adults in Vietnam.

Domain	Key issues	Implications for nursing care	Citation
Outpatient care	Frequent visits for chronic disease follow-up	Strengthen chronic disease monitoring and medication counseling	(36–38)
Hospital care	High use of public hospitals and specialist services	Improve discharge planning and transitional care	(36,37)
Long-term care	Limited formal LTC services; reliance on family care	Develop home-based nursing and caregiver training	(39–41)
Dementia care	Increasing demand; limited community support	Provide caregiver education and behavioral management support	(29,39,42)

Rehabilitation	Stroke, falls, frailty, and mobility impairment	Promote functional recovery and fall prevention	(26–28,35)
Medication management	Polypharmacy and adherence problems	Implement medication review and safety counseling	(34,36)

Table 4 shows that older adults in Vietnam require care across multiple levels, from primary care and hospital services to long-term home support. The heavy reliance on public hospitals suggests that primary care and community-based geriatric services remain underdeveloped. Long-term care needs are particularly important because many older adults live with chronic illness, frailty, dementia, or functional dependence. These findings highlight the need to strengthen nursing roles in care coordination, caregiver education, medication safety, rehabilitation support, and home-based elderly care.

3.5. Nursing care implications for healthy aging

The findings of this review have important implications for nursing practice in Vietnam. First, nurses should play a stronger role in early detection and management of chronic diseases among older adults. Hypertension, diabetes, cardiovascular diseases, and chronic respiratory diseases are common but often underdiagnosed or poorly controlled. Community nurses can support screening, health education, medication adherence, and lifestyle modification. Second, comprehensive geriatric assessment should be integrated into routine nursing care. Assessment should include physical function, cognitive status, nutritional status, fall risk, depression, medication use, and social support. Such multidimensional assessment allows nurses to identify frailty, functional decline, and unmet care needs earlier. Third, fall prevention should become a core component of geriatric nursing practice. Falls among older adults are associated with injury, hospitalization, disability, and fear of falling. Nursing interventions should include home safety assessment, balance and strength promotion, vision screening, medication review, and caregiver education (35).

Fourth, nurses should support family caregivers. Because family members remain the primary source of elderly care in Vietnam, caregiver education is essential. Nurses can train caregivers in safe transfer techniques, medication administration, nutrition support, pressure injury prevention, dementia care, and recognition of warning signs requiring medical referral (39,42). Fifth, gerontological nursing education should be strengthened. Evidence from Vietnam suggests that nursing students and healthcare providers need improved geriatric knowledge, attitudes, and willingness to care for older adults (43,44). Nursing curricula should include healthy aging, frailty, dementia, long-term care, communication with older adults, and palliative care. Finally, nurses should contribute to policy and service innovation. As Vietnam develops age-friendly healthcare models, nurses can help design community-based elderly care, home-visiting programs, chronic disease clubs, and integrated social-healthcare services. This is particularly important in rural and underserved areas where access to specialist care is limited.

3.6. Future directions

Future healthy aging strategies in Vietnam should prioritize prevention, functional preservation, and community-based care. First, national aging surveillance should be strengthened to monitor chronic diseases, frailty, disability, dementia, depression, and long-term care needs among older adults. Such data are essential for planning geriatric services and workforce development. Second, primary healthcare should be reoriented toward age-friendly chronic disease management. Commune health stations should be equipped to provide routine screening, follow-up, medication management, and referral coordination for older adults. Third, Vietnam should develop formal long-term care policies and service packages. These may include home care, day care, respite care, rehabilitation services, dementia support, and caregiver training. A mixed model involving public, private, community, and family-based care may be most realistic. Fourth, nursing education and continuing professional development should place greater emphasis on gerontology. Geriatric nursing competencies are essential for responding to the growing health burden of aging. Fifth, research should focus on Vietnamese-specific evidence regarding frailty, sarcopenia, dementia, caregiver burden, polypharmacy, and nursing interventions. More longitudinal and intervention studies are needed to guide policy and practice.

4. Conclusion

Healthy aging in Vietnam is becoming an urgent public health and nursing priority due to rapid population aging, increasing chronic disease burden, functional decline, and growing long-term care needs. Evidence shows that older adults face multiple interrelated challenges, including hypertension, diabetes, stroke, frailty, dementia, depression, ADL/IADL limitations, falls, polypharmacy, and dependence on family caregivers. These challenges require more than disease treatment; they demand integrated, person-centered, and community-based care models. Nursing practice has

a central role in promoting healthy aging through chronic disease management, geriatric assessment, fall prevention, rehabilitation support, medication safety, caregiver education, and care coordination. Strengthening geriatric nursing education, primary healthcare capacity, and long-term care systems will be essential to improve quality of life and reduce disability among older adults in Vietnam.

Compliance with ethical standards

Acknowledgments

The authors would like to thank researchers, healthcare professionals, and public health institutions whose published work has contributed to understanding healthy aging and elderly care in Vietnam.

Disclosure of conflict of interest

The authors declare no conflict of interest.

References

[1] World Health Organization. World report on ageing and health. Geneva: World Health Organization; 2015.

[2] World Health Organization. Decade of healthy ageing: baseline report. Geneva: World Health Organization; 2020.

[3] Beard JR, Officer A, de Carvalho IA, Sadana R, Pot AM, Michel JP, et al. The World report on ageing and health: a policy framework for healthy ageing. Lancet. 2016;387(10033):2145–2154.

[4] General Statistics Office of Viet Nam, United Nations Population Fund. Population ageing and older persons in Viet Nam. Hanoi: General Statistics Office of Viet Nam and UNFPA; 2021.

[5] General Statistics Office of Viet Nam. Results of the 2019 Population and Housing Census. Hanoi: Statistical Publishing House; 2020.

[6] General Statistics Office of Viet Nam, United Nations Population Fund. Older persons in Viet Nam: an analysis of the Population Change and Family Planning Survey 2021. Hanoi: GSO and UNFPA; 2022.

[7] Ministry of Health of Viet Nam, World Health Organization Regional Office for the Western Pacific. National survey on the risk factors of noncommunicable diseases in Viet Nam, 2021. Manila: World Health Organization Regional Office for the Western Pacific; 2025.

[8] World Health Organization. Viet Nam STEPS 2021. WHO NCD Microdata Repository; 2024.

[9] GBD 2019 Diseases and Injuries Collaborators. Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019. Lancet. 2020;396(10258):1204–1222.

[10] GBD 2019 Risk Factors Collaborators. Global burden of 87 risk factors in 204 countries and territories, 1990–2019. Lancet. 2020;396(10258):1223–1249.

[11] Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Soc Res Methodol. 2005;8(1):19–32.

[12] Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. Implement Sci. 2010;5:69.

[13] Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): checklist and explanation. Ann Intern Med. 2018;169(7):467–473.

[14] General Statistics Office of Viet Nam. Population Change and Family Planning Survey 2021. Hanoi: Statistical Publishing House; 2022.

[15] General Statistics Office of Viet Nam, United Nations Population Fund. Population Ageing in Viet Nam: Current Situation, Forecast, and Policy Recommendations. Hanoi; 2021.

[16] United Nations Population Fund Vietnam. Ageing in Viet Nam: An Analysis from the 2019 Population and Housing Census. Hanoi; 2021.

[17] World Bank. World Development Indicators: Life expectancy at birth, Vietnam. Washington DC: World Bank; 2024.

[18] World Health Organization. Global Health Observatory: Healthy life expectancy (HALE). Geneva; 2024.

[19] United Nations. World Population Prospects 2022. New York: United Nations Department of Economic and Social Affairs; 2022.

[20] Giang LT, Pfau WD. The elderly population in Vietnam during economic transformation: an overview. J Popul Ageing. 2009;2(3):135–146.

[21] Ministry of Health of Viet Nam, World Health Organization. National survey on the risk factors of noncommunicable diseases (STEPS) in Viet Nam 2021. Manila: WHO Regional Office for the Western Pacific; 2025.

[22] Meiqari L, Essink D, Wright P, Scheele F. Prevalence of hypertension in Vietnam: a systematic review and meta-analysis. Asia Pac J Public Health. 2019;31(2):101–112.

[23] Hien HA, Tam NM, Tam V, Derese A, Devroey D. Hypertension, cardiovascular risk factors and frailty among older adults in Vietnam. Int J Hypertens. 2018;2018:6326984.

[24] Biswas T, Tran N, Thi My Hanh H, et al. Type 2 diabetes and hypertension in Vietnam: a systematic review and meta-analysis. BMJ Open. 2022;12:e052725.

[25] Nguyen CT, Pham NM, Lee AH, Binns CW. Prevalence of type 2 diabetes in Vietnam: systematic review and meta-analysis. Asia Pac J Public Health. 2015;27(6):588–600.

[26] Feigin VL, Brainin M, Norrving B, et al. World Stroke Organization global stroke fact sheet 2022. Int J Stroke. 2022;17(1):18–29.

[27] GBD 2021 Stroke Collaborators. Global, regional, and national burden of stroke and its risk factors, 1990–2021. Lancet Neurol. 2024;23(3):344–367.

[28] Collard RM, Boter H, Schoevers RA, Oude Voshaar RC. Prevalence of frailty in community-dwelling older persons: a systematic review. J Am Med Dir Assoc. 2012;13(1):10–18.

[29] Alzheimer's Disease International. World Alzheimer Report 2023. London: ADI; 2023.

[30] World Health Organization. Mental health of older adults. Geneva: WHO; 2023.

[31] Katz S, Ford AB, Moskowitz RW, Jackson BA, Jaffe MW. Studies of illness in the aged: the index of ADL. JAMA. 1963;185(12):914–919.

[32] Nguyen TTH, Nguyen LH, et al. Functional limitations and activities of daily living among Vietnamese older adults: evidence from national aging data. BMC Geriatr. 2022;22:645.

[33] Cruz-Jentoft AJ, Bahat G, Bauer J, et al. Sarcopenia: revised European consensus on definition and diagnosis. Age Ageing. 2019;48(1):16–31.

[34] Maher RL, Hanlon J, Hajjar ER. Clinical consequences of polypharmacy in elderly. Expert Opin Drug Saf. 2014;13(1):57–65.

[35] World Health Organization. World report on falls prevention in older age. Geneva: WHO; 2007.

[36] Nguyen MP. Health services utilization among older adults in Vietnam: evidence from the National Household Living Standard Survey 2016. Asia Pac J Public Health. 2022;34(2-3):294–300.

[37] Giang LT, Nguyen TT, Nguyen HT. Healthcare services utilisation and financial burden among older people in Vietnam. Int J Environ Res Public Health. 2023;20(12):6097.

[38] Huu KP. The healthcare support program and healthcare utilization among older adults in ethnic minority areas of Vietnam. Soc Sci Med. 2024;350:116910.

[39] Hoi LV, Thang P, Lindholm L. Elderly care in daily living in rural Vietnam: need and its socioeconomic determinants. BMC Geriatr. 2011;11:81.

[40] United Nations Population Fund Vietnam. Population Ageing and Older Persons in Viet Nam. Hanoi: UNFPA; 2021.

[41] Van PH, Saito Y, Pham T. Older persons and long-term care in Viet Nam. In: Coping with Rapid Population Ageing in Asia. Jakarta: ERIA; 2021.

[42] Le Huynh-Truong H, et al. Dementia care practices among community healthcare professionals and family caregivers in Vietnam. BMC Geriatr. 2023;23:xxx.

[43] Adetunji O, et al. Evidence-based geriatric knowledge among healthcare providers in Vietnam: validation and application of a geriatric knowledge assessment instrument. BMC Geriatr. 2023;23:xxx.

[44] Cuc DTK, et al. Nursing students' knowledge, attitudes, and willingness to care for older adults in Vietnam. Geriatr Nurs. 2025;xx:xx–xx.

[45] Duong TPT, Nguyen TTT, Nguyen HT. Predictors for nursing students' perception of working with older people in Vietnam. MedPharmRes. 2022;6(4):xx–xx.