

Healthy Ageing in Nepal: Key Challenges and Possible Solutions

✉ Bhakta Bahadur KC¹, Grish Paudel², Laxmi Kumari Oli³, Keshav Raj Paudel⁴, Lal Bahadur Rawal^{2,5,6}

¹Ministry of Health and Population, Nepal

²Central Queensland University, School of Health, Department of Medical and Applied Sciences, Queensland, Australia

³Nepalganj Medical College and Teaching Hospital, Demarpent of Neonatal Intensive Care Unit, Nepalganj, Nepal

⁴Royal Prince Alfred Hospital, Centenary UTS Centre for Inflammation, Sydney, Australia

⁵Central Queensland University, Appleton Institute, Physical Activity Research Group, Queensland, Australia

⁶Western Sydney University, Translational Health Research Institute and School of Social Sciences, Sydney, Australia

Abstract

The ageing population worldwide, including that in Nepal, is increasing rapidly. The older population faces a range of health and non-health-related challenges. This review paper explored the concept of healthy ageing, identified the key challenges among the aged population, and proposed a revised social ecological model (SEM) that could be customized and tailored in the context of Nepal to improve the overall health and well-being of older populations. Despite existing policies like social security and elderly health care concession, implementation remains weak due to a systemic gap. Tackling these challenges will require coordinated efforts from both state and non-state sectors in Nepal focusing on social protection, healthcare accessibility, infrastructure adaptation, and shifts in societal attitudes. A multi-level SEM approach, encompassing individual, interpersonal, community, organizational and policy intervention, is recommended to foster healthy ageing in Nepal and similar low-resource settings.

Keywords: Ageing, challenges, health, Nepal, older population, socio-ecological model

Introduction

The world's population is aging rapidly, with one in six people expected to be 65 or older by 2050-up from fewer than one in ten today. Nearly 80% of these older individuals will reside in what are currently low- and middle-income countries (LMICs), including Nepal (1). In Nepal, the aged population (60 years and above) has increased from 8.1% in 2011 (2) to 10.2% in 2021 (3). As individuals age, their social and health needs increase. The concept of healthy ageing is of great importance to enjoy longevity and quality of life. Healthy ageing can be achieved by creating favorable environments and opportunities for older adults to improve their quality of life and support independent living. While we celebrate the increased longevity (4,5) we must also address the wide range of physical, mental, and social challenges associated with ageing including chronic non-

communicable diseases, poor health and reduced quality of life (6-8).

Although the ageing and health agenda has gained momentum under the United Nations' Sustainable Development Goals (SDGs)-particularly SDG 3 "(ensure healthy lives and promote well-being for all at all ages")-the formulation and implementation of tailored policies in developing countries remain underexplored, despite evidence highlighting the necessity of integrating aging and health priorities into national social policies and programs (9). Therefore, this article aims to highlight the concept of healthy ageing, identify the existing challenges among the ageing population, and propose a revised social ecological model (SEM) to improve the overall health and well-being of older populations in Nepal.

Address for Correspondence: Bhakta Bahadur KC, MD, National Health Education, Information and Communication Center, Teku, Nepal

E-mail: dr.lalrawal@gmail.com-bhaktakc2005@gmail.com **ORCID:** orcid.org/0000-0003-1106-0108-orcid.org/0000-0002-3306-2940

Received: 07.04.2025 **Accepted:** 17.07.2025 **Publication Date:** 26.12.2025

Cite this article as: KC BB, Paudel G, Oli LK, Paudel KR, Rawal LB. Healthy ageing in nepal: key challenges and possible solutions. Eur J Geriatr Gerontol. 2025;7(3):193-198



Copyright© 2025 The Author. Published by Galenos Publishing House on behalf of Turkish Academic Geriatrics Society.

This is an open access article under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND) International License.



Healthy Ageing

The World Health Organization defines healthy ageing as "the process of developing and maintaining the functional ability that enables well-being in older age" (10). This functional ability of a person is determined by three factors: the person's intrinsic capacity, relevant environmental characteristics, and the interaction between them. Intrinsic capacity includes all of an individual's physical and mental capacities for independent living. The environmental characteristics consist of national to local level policies, existing systems, and services delivered related to transport, housing, social protection, parks, social facilities, institution-based care and home-based care, relationships with friends, family, and caregivers, and cultural and social perception and values (11). Thus, healthy ageing is fundamentally the creation of supportive environments and opportunities that enable people to realize their aspirations throughout the life course (12).

Challenges for Ageing Populations in Nepal

The government of Nepal has addressed many issues, including socioeconomic barriers of older people, by reflecting in several programs such as a social security fund, old age allowance, and free health care for older people. However, older people have encountered several challenges to enjoy healthy ageing in Nepal. This section examines the challenges in detail.

The readiness of the health and social system in transitional demographic and social status: Over the last decade, the social status of the people has increased because of the easier life, economic opportunities, employment, and services in urban areas (13). According to the 2011 census of Nepal, the urban population doubled from 14.2% in 2001 to 27% in 2011, with the annual growth rate three and a half times more in urban than rural areas (0.98) (14). The migration from low-income regions to higher-income regions is considered social migration, which is mostly happening in many countries (14). This trend reflects social migration, where mostly the younger populations leave their homes; often leaving older members in the rural areas. As a result, many older people cannot get the filial respect, support, and care as much as they need.

Additionally, Nepal has seen a rapid shift from the joint to nuclear family. The 2011 census revealed that households with 1 to 4 members became the most common, whereas five people per households were highest size in 2001. This transition has led to the social isolation of older adults, as their traditional decision-making roles in the families and communities continue to diminish (14).

On the other hand, older people who have recently migrated with their younger families to the city are also facing many problems. Most of the cities lack adequate parks, open spaces for recreation, and age-friendly infrastructures, confining

older people to their homes. Also, the unorganized traffic, unmanaged footpath, and uncontrolled air pollution in the cities have impacted people's ability to perform their outdoor physical activities, such as jogging, running, cycling, and so on. These problems collectively restrict opportunities for physical activities, social interaction, that ultimately may result in developing NCDs such as cardiovascular diseases, diabetes, and even mental health problems among the older population.

The proportion of the older population aged 60 years and above has increased in Nepal and is projected to more than double, from 8% in 2011 to 18.6% by 2050 (15). Despite this rapid ageing trend, current infrastructure, social systems, and health systems are not adequate to respond to the social and demographic challenges in Nepal (16).

Social security: The social security fund was established in Nepal on 27 November 2018, making a milestone for ageing population as more than 28% of the total 31% contribution goes to the old-age pension (17,18). However, a major challenge is enrolling all the workers, as many formal sectors have yet to register. Additionally, almost two third of Nepal's active workforce is working in the informal sector (19,20). These large proportions of casual sector workers have not been enrolled, and this cohort of older people would be deprived of obtaining security in the future. Moreover, women are disproportionately deprived of the old age pension as only a few are enrolled in the formal employment sectors (21). Therefore, the current social protection system for the older population is and will continue to be a challenge. Furthermore, the inflation and cost of care have increased dramatically over the past few decades, making the current old age allowance of approximately 29 USD per month in Nepal-is insufficient to cover the cost incurred (22).

Access and availability of health care for older people: Although the government has introduced policies to provide at least 50% concession for older people, implementation remains weak, and most of the health care services and infrastructure are not old age-friendly (23). For example, there are no assisting services for older people with impairments like hearing loss and poor vision.

Degenerative disorders and their consequences in the aged population like difficulty in walking, pain in joints, mental disorders, especially dementia and Alzheimer's diseases, fall injury, incontinence of urine and stool, osteoporosis, and osteoarthritis require specialized care from trained health professionals (24). However, Nepal faces a severe shortage of health care workforce specializing in geriatric care. Further, no dedicated hospital for older people has been established so far (25). Since most of the health care facilities are urban-centered, the old-age population residing in rural areas is less likely to use the health care services they need due to long distance and geographical barriers.

Stereotyping attitude and perception and behavior towards the older people: In Nepal, ageing is considered as natural process, leading to neglect by, family members and society. When older people become ill, they often do not receive the same levels of access to health care facilities as younger individuals. For example, during the Coronavirus Disease 2019 pandemic, people are less likely to worry if the deceased person is of older age, reflecting a societal belief that illness and disorders are inevitable in old age.

This deep-rooted attitude hinders efforts to improve the health and quality of life of the older population. Evidence shows that many older individuals in Nepal face abuse, discrimination, and violence, whether mental, psychological, or even sexual within families nursing homes, and public places. Studies conducted in different parts of Nepal revealed that over 50% of the older adults have experienced some form of abuse or mistreatment (26-28). Alarmingly, 70-95% of these incidents go neglected or unreported (29). These forms of mistreatment are strongly associated with increased morbidity and mortality among the elderly (30).

Possible Solutions to Address the Challenges

Given the increasing problem (both health and non-health related) among the older age populations in Nepal, there has been a critical need for developing a system that appropriately acknowledges their needs and challenges at the upstream (systems-level) and downstream (service-delivery level), thereby providing effective measures. Consideration of the social-ecological perspective and addressing the social determinants of health, mainly for ageing populations, would be an approach to addressing the challenges of ageing populations in Nepal. We have proposed a SEM in the context of Nepal and the details of SEM are outlined in the following section. The following are some of the key recommendations that need urgent attention in the context of healthy ageing in Nepal:

Social protection for the older population in Nepal: With rising personal and healthcare needs among Nepal's growing ageing population comprehensive and integrated social security programs are crucial. To ensure inclusivity, the informal sectors must be enrolled into welfare schemes with timely payment mechanism to guarantee accessibility for all older citizens

The change of social and engineering infrastructure: The service outlets of new and old structures should be developed or modified to make them convenient for older people. The evidence shows that public buildings and outdoor spaces greatly impact morbidity, mortality, and quality of life (31). To achieve this, country-level policy and guidelines must be established to reengineer those structures. As urbanization rapidly increases, cities must become age-friendly to address the needs of the growing aging population. For instance, parks with green and

open space should be built in every local suburb and community for recreation and physical exercises (31). In addition, for those who prefer to spend the rest of their lives in aged-care facilities among peers, the government and the private sectors should collaborate to develop well-organized aged-care homes with high-quality routine and nursing care. There is also a need to develop appropriate policies, strategies, and guidelines to regulate and guide the aged care facilities in Nepal.

Reorienting the health system: National policies, strategies, and programs must prioritize a shift from hospital-based long-term care to home-based care services. Since health can be created and maintained in the homes and communities, the critical interventions needed are: the financial compensation for family caregivers and enhanced health literacy to improve home care while developing a professional caregiving workforce. The periodic plan should emphasize multi-sectoral engagement, involving relevant ministries, to ensure effective implementation—including the allocation of a designated percentage of hospital beds and/or wards for senior citizens and the establishment of elderly community care centers, as mandated by the 16th national plan and its predecessors, to accelerate inclusive service delivery (32). The Health Sector Strategic Plan, which is developed every five years, should also outline the strategic direction for reorienting the health system to address the needs of the aged population.

Raising awareness about healthy ageing: A paradigm shift in societal attitude is imperative to overcome the prevailing ageism and reconstruct the sociocultural narrative surrounding ageing. Multilevel awareness programs targeting behavior modification towards the older populations are considered a robust strategy to achieve this transformation (33). Such interventions must be implemented across the social-ecological spectrum, from within a person to broader societal and environmental levels, and through diverse communication channels. The SEM emphasizes understanding the multifaceted and interactive effects of multiple factors including individual, familial, environmental, and systemic that collectively determine the behaviors of every individual, affecting levels from the individual to the broader societal (34-36). This model identifies key leverage points for intervention, enhancing the health and well-being of individuals, families, communities, and society on a larger scale (36-38). The structural interventions should include updating the curriculum on ageing, and these updates could extend across primary to tertiary education. Next, establish a legal accountability mechanism to ensure the right of the older population to live with dignity, with sanctions for non-compliance at familial or community levels.

Empowerment and inclusion of older people: The older people should be actively engaged in the decision-making processes that directly affect them. To combat social isolation, they must also be encouraged to participate in social and community

functions. As older people have numerous experiences throughout their lives, they must be provided the opportunities to share their opinion at meetings and committees for local development and finding solutions for various ongoing issues.

Proposed Social Ecological Model for Healthy Ageing

In the Nepalese context, we propose a revised SEM to improve the overall status of older populations (Figure 1). The SEM has been used broadly in the health sector (38-42), including in the efforts to better understand and improve the health and well-being of ageing populations (43-46). The SEM is a theory-based framework that emphasizes the understanding of multifaceted and interactive effects of factors that influence behavior. SEM supports determining behavioral and organizational leverage in efforts to enhance the health and wellbeing of the individual, family, community, and society on a larger scale (36-38). According to Urie Bronfenbrenner, the renowned American developmental psychologist, biological and genetic factors are key to human development; however, the entire ecological system where human development occurs needs to be acknowledged (47,48). The interplay between the genetic/biological factors and factors within the social-ecological systems is essential to well-being and development. Bronfenbrenner described different social-ecological factors in four systems that directly and indirectly affect development

and wellbeing. These include (i) micro-system, which relates to human physical and social environments; (ii) meso-system, which explains external environments; (iii) exo-system or the external factors that affect development and wellbeing, such as social, political, and economic conditions; and (iv) macro-system, which relates to beliefs and attitudes of the general population, which then also have an influence on the factors described within the micro, meso, and exo-system, as well as to the overall development and wellbeing of individuals (48).

In general, five hierarchical levels of SEM have been recommended and used in social science, psychology, and health science. These levels include (i) Individual, (ii) interpersonal, (iii) community, (iv) organizational, and (v) policy/enabling environments (41). In particular, for protecting and promoting healthy ageing in the context of Nepal, depending on the nature of the study and programs, we propose a recommended model (Figure 1). The proposed model provides a basis for considering health at the individual, family, community, or larger societal levels, highlighting its importance. However, there is a need to develop an effective approach to the health and social well-being of the older population by a combination of all interventions at all levels. In the context of Nepal, the SEM can be considered as an integral part of the overall health and well-being of the older population, which has interdependence and



Figure 1. Proposed social ecological model of healthy ageing in low socioeconomic context

reciprocal relationship among elements of each level. The basic components of SEM and the ones proposed in the context of Nepal are best used to improve the health and well-being of ageing populations in many LMICs including Nepal. The major elements of proposed SEM that could particularly be carefully considered in the context of Nepal include:

Individual level: Provision of improving general and health literacy of older populations; adoption of healthy behaviour including diet, physical activity, and no smoking/alcohol; empower older population for self-confidence, self-care and enhance self-efficacy; provision of social security such as subsidized/free health care, subsidized transportation cost, etc.

Interpersonal level: Ensure family support and provision of physical, mental, emotional, and social supports; spending time with friends and involvement of peers; food security and healthy living conditions; provision of informal care when needed; supportive social network/interaction, and participation in the social activities.

Organizational level: Provision of parks and recreational centers for older populations; older people friendly walking paths; provision of non-formal education to older people; provision of counseling when needed; introducing and strengthening old age homes and older people health care homes; access to and availability of cultural and religious activities for older populations.

Community/society level: Provision of social security schemes; ensure access to health care services; home care centers and their quality; ensure social security; provision of older people friendly transportation and roads; accessibility to green space and its quality (furniture, sitting facilities, lighting).

Public policy level: Ensure political commitment to older people to build a community appropriate for older adults; ensure good governance and introduce a policy to subsidize care and services for older people. Policy for critical illness; Introduce a health insurance policy to ensure free health care and a health promotion package for older people.

Conclusion

Nepal's rapidly increasing population face significant challenges including limited healthcare access, inadequate social security, age-unfriendly infrastructure, and deep-rooted ageism. Addressing these issues requires urgent, multi-faceted interventions. Nepal must strengthen political commitment through policies that prioritize elderly well-being, such as expanding pensions and subsidized healthcare. Additionally, the health system should be reoriented toward long-term and home-based care, with dedicated services for older adults. Urban infrastructure must be adapted to be age-friendly, featuring safe walkways and recreational spaces, while intergenerational solidarity should be promoted to reduce social

isolation. Combating ageism through awareness campaigns and education reforms is equally critical. To ensure sustainable progress, Nepal should implement the proposed SEM, which integrates interventions at individual, community, and policy levels. Collective action from government, civil society, and communities is essential to create an inclusive environment where older adults can age with dignity and good health. Moving forward, evidence-based and culturally sensitive strategies must be prioritized to meet the unique needs of Nepal's ageing population and foster a society that values and supports its elderly citizens.

Ethics

Ethics Committee Approval: Ethical approval was not applicable as this article is based on literature review and does not include human or animal studies.

Informed Consent: Informed consent was not applicable as this article is based on literature review and does not include human or animal studies.

Footnotes

Authorship Contributions

Concept: B.B.KC., G.P., L.O., K.R.P., L.B.R., Design: B.B.KC., G.P., L.O., K.R.P., L.B.R., Literature Search: B.B.KC., G.P., L.O., K.R.P., L.B.R., Writing: B.B.KC., G.P., L.O., K.R.P., L.B.R.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. Johansson De Silva S, Santos IV. Productive longevity: what can work in low-and middle-income countries?: World Bank; 2023.
2. Central Bureau of Statistics. National Population and Housing Census 2021 [Internet]. Kathmandu (NP): Central Bureau of Statistics; 2021 [cited 2025 Oct 21]. Available from: <https://censusnepal.cbs.gov.np/results/population>
3. Chalise HN. Aging trend and situation in Nepal. *Adv Aging Res.* 2023;12:39-48.
4. Knickman JR, Snell EK. The 2030 problem: caring for aging baby boomers. *Health services research.* 2002;37:849-884.
5. National Research Council Committee on Population. Preparing for an aging world: the case for cross-national research: National Academies Press; 2001.
6. Gurung LB, Paudel G, Yadav UN. Health service utilization by elderly population in urban Nepal: a cross-sectional study. *Journal of Manmohan Memorial Institute of Health Sciences.* 2016;2:27-36.
7. Yadav UN, Thapa TB, Mistry SK, Ghimire S, Yadav KK, Boateng GO, O'Callaghan C. Biosocial and disease conditions are associated with good quality of life among older adults in rural eastern Nepal: findings from a cross-sectional study. *PLOS ONE.* 2020;15:0242942.
8. Acharya S, Ghimire S, Jeffers EM, Shrestha N. Health care utilization and health care expenditure of Nepali older adults. *Front Public Health.* 2019;7:24.

9. Dhakal SP, Aryal MM. Ageing and health agenda for Nepal: challenges and policy responses for sustainable development. *Ageing Asia and the Pacific in Changing Times: Implications for Sustainable Development*: Springer; 2022;165-182.
10. World Health Organization. Ageing and functional ability [Internet]. Geneva: World Health Organization; [cited 2025 Oct 21]. Available from: <https://www.who.int/news-room/questions-and-answers/item/healthy-ageing-and-functional-ability>
11. World Health Organization. Global strategy and action plan on ageing and health. 2017.
12. Stephens C, Breheny M, Mansvelt J. Healthy ageing from the perspective of older people: a capability approach to resilience. *Psychology Health*. 2015;30:715-731.
13. Davis S, Bartlett H. Healthy ageing in rural Australia: issues and challenges. *Australas J Ageing*. 2008;27:56-60.
14. Central Bureau of Statistics. Population monograph of Nepal 2014. Volume I: Demographic analysis. Kathmandu (NP): Central Bureau of Statistics; 2014.
15. HelpAge International. Ageing population in Nepal 2019 [Internet]. London: HelpAge International; [cited 2025 Oct 21]. Available from: <https://ageingasia.org/ageing-population-nepal/>.
16. World Health Organization. Ageing and health [Internet]. Geneva: World Health Organization; 2022 [cited 2025 Oct 21]. Available from: <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health>.
17. Acharya BR. Social protection policy and its response in Nepal. *Humanities and Social Sciences Journal*. 2022;14:126-139.
18. Adhikari M, Kishore A, Koirala P, Rashid S. Social safety nets in Nepal: a review. 2024.
19. International Labour Organization. Informal economy in Nepal [Internet]. Geneva: International Labour Organization; [cited 2025 Oct 21]. Available from: <https://www.ilo.org/kathmandu/areasofwork/informal-economy/lang--en/index.htm>.
20. Government of Nepal. Economic survey 2018/2019. Singh Durbar, Kathmandu (NP): Ministry of Finance; 2019. Available from: https://old.mof.gov.np/uploads/document/file/compiled%20economic%20Survey%20english%207-25_2019111101758.pdf
21. International Labour Organization. Social protection for older persons: key policy trends and statistics. Geneva: ILO; 2014.
22. World Bank. Adding Little to Life [Internet]. Washington, DC: World Bank; 2024 [cited 2025 Oct 21]. Available from: <https://www.worldbank.org/en/news/feature/2024/01/17/adding-a-little-more-to-life>
23. Government of Nepal. Senior Citizens Act, 2007 [Internet]. Kathmandu (NP): Nepal Law Commission; 2007 [cited 2025 Oct 21]. Available from: <https://www.lawcommission.gov.np/en/archives/12881>.
24. Lunenfeld B, Stratton P. The clinical consequences of an ageing world and preventive strategies. *Best Pract Res Clin Obstet Gynaecol*. 2013;27:643-659.
25. Government of Nepal. The Fifteenth Plan (Fiscal Year 2019/20-2023/24) [Internet]. Singh Durbar, Kathmandu (NP): National Planning Commission; 2020 [cited 2025 Oct 21]. Available from: <https://www.npc.gov.np>.
26. Yadav UN, Paudel G. Prevalence and associated factors of elder mistreatment: a cross sectional study from urban Nepal. *Age and Ageing*. 2016;45:609-613.
27. Yadav UN, Tamang MK, Paudel G, Kafle B, Mehta S, Chandra Sekaran V, Gruiskens JRJH. The time has come to eliminate the gaps in the under-recognized burden of elder mistreatment: a community-based, cross-sectional study from rural eastern Nepal. *PLOS ONE*. 2018;13:e0198410.
28. Chalise H, Paudel B. Elderly abuse among community-living older adults of least developed country-Nepal. *Arch Phys Rehabil Med*. 2020;1:1-8.
29. Jayawardena KM, Liao S. Elder abuse at end of life. *J Palliat Med*. 2006;9:127-136.
30. Lachs MS, Williams CS, O'Brien S, Pillemer KA, Charlson ME. The mortality of elder mistreatment. *Jama*. 1998;280:428-432.
31. World Health Organization. Global age-friendly cities: a guide [Internet]. Geneva: World Health Organization; 2007 [cited 2025 Oct 21]. Available from: <https://www.who.int/publications/item/9789241547307>.
32. Government of Nepal, National Planning Commission. The Sixteenth Plan (2024-2029) [Internet]. Singh Durbar, Kathmandu (NP): National Planning Commission; 2024 [cited 2025 Oct 21]. Available from: <https://www.npc.gov.np>
33. Wettstein M, Kornadt AE, Wahl H-W. Awareness of age-related changes among middle-aged and older adults: longitudinal trajectories, and the role of age stereotypes and personality traits. *Frontiers in psychiatry*. 2022;13:902909.
34. Snijder M, Lees B, Stearne A, Ward J, Garlick Bock S, Newton N, Stapinski L. An ecological model of drug and alcohol use and related harms among Aboriginal and Torres Strait Islander Australians: a systematic review of the literature. *Prev Med Rep*. 2021;21:101277.
35. Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: assessing partnership approaches to improve public health. *Annu Rev Public Health*. 1998;19:173-202.
36. Sallis JF, Owen N, Fisher EB. Ecological models of health behavior. In: Glanz K, Rimer BK, Viswanath K, editors. *Health Behavior and Health Education: Theory, Research, & Practice*. 4th ed. San Francisco (CA): Jossey-Bass; 2008. p. 465-486. [Internet]. Available from: <https://espace.library.uq.edu.au/view/UQ%3A175068>.
37. Newes-Adeyi G, Helitzer DL, Caulfield LE, Bronner Y. Theory and practice: applying the ecological model to formative research for a WIC training program in New York State. *Health Educ Res*. 2000;15:283-291.
38. Lounsbury DW, Mitchell SG. Introduction to special issue on social ecological approaches to community health research and action. *Am J Community Psychol*. 2009;44:213-220.
39. Rawal LB, Smith BJ, Quach H, Renzaho AMN. Physical Activity among adults with low socioeconomic status living in industrialized countries: a meta-ethnographic approach to understanding socioecological complexities. *J Environ Public Health*. 2020;2020:4283027.
40. Fleury J, Lee SM. The social ecological model and physical activity in African American women. *Am J Community Psychol*. 2006;37:129-140.
41. Golden SD, Earp JA. Social ecological approaches to individuals and their contexts: twenty years of health education & behavior health promotion interventions. *Health Educ Behav*. 2012;39:364-372.
42. Centers for disease control and prevention (CDC). The social-ecological model: a framework for prevention 2022 [Available from: <https://www.cdc.gov/violenceprevention/about/social-ecologicalmodel.html>].
43. Chung J, Seo JY, Lee J. Using the socioecological model to explore factors affecting health-seeking behaviours of older Korean immigrants. *Int J Older People Nurs*. 2018;13:e12179.
44. Potempa KM, Butterworth SW, Flaherty-Robb MK, Gaynor WL. The healthy ageing model: health behaviour change for older adults. *Collegian*. 2010;17:51-55.
45. Lin SH. A Social ecological perspective on physical activity of low-income older adults in singapore. *J Aging Phys Act*. 2021;29:51-62.
46. Zheng Z, Yang L. Neighborhood environment, lifestyle, and health of older adults: comparison of age groups based on ecological model of aging. *sustainability*. 2019;11:2077.
47. Paquette D, Ryan JC, editors. *Bronfenbrenner's ecological systems theory* [Internet]. 2001 [cited 2025 Oct 21]. Available from: <https://www.simplypsychology.org/Bronfenbrenner-ecological-systems-theory.html>.
48. Neal JW, Neal ZP. Nested or networked? Future directions for ecological systems theory. *Soc Dev*. 2013;22:722-737.