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From Youth Bulge to Ageing Society: Dependency Ratio, Life Expectancy and Disability among Older Adults in Nepal (1991–2021)

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Abstract

Nepal is witnessing a very fast demographic transition of the young to the aging society with dire consequences in the social, health and development policies. The article is intended to be a review of population composition, dependency ratio, and survival rates. The National Population and Housing Census (NPHC) was used to calculate life expectancy and disability rates among older individuals (60 and older) in Nepal from 1991 to 2021. The results indicate that the percentage of children (0-14 years) has been on the decline since 1991, varying between 42.4% and 27.8% as at 2021. At the same time, there is an increase in the population of working-age (15-59 years) and older people (5.8% to 10.2%). There are regional and gender-based differences as well: the greatest life expectancy in age until 60 is found in hilly regions and among women, whereas the expected lifespan at the age of 60 differs across provinces, with a higher expectancy in the Mountain and Sudurpashchim regions. Disability in the aged is estimated at 6.9 percent, with the most common impairments being physical, visual and auditory impairments. The provincial and ecological disparities predict that aging in Nepal is heterogeneous, and context-specific policies are needed. The findings highlight the importance of leveraging the demographic dividend, improving health and long-term care systems, and implementing inclusive social protection and age-friendly policies. The paper presents evidence of a nationally representative and sub-nationally

disaggregated study that can be used to shape the approach to healthy aging and proactive planning to guarantee longer, healthier, more autonomous, and dignified lives.
***Keywords*:** Ageing, Dependency Ratio, Disability, Life Expectancy, Older Adults

Introduction

Nepal is experiencing a high rate and widespread demographic transition, shifting towards an ageing society. This is a change that has been characterized as a shift between a youth bulge and an older age structure occurring due to continued falls in fertility, child survival, and constant increments in life expectancy (Chalise, 2006; Shrestha et al., 2014). Though the ratio, along with an absolute number of younger generations, remains high, the burden of older people is growing faster than over the last decades, establishing new dependency trends and giving a new picture to social and economic, health systems (Jane Osareme et al., 2024). When considering effective policy planning in the context of a lower-middle-income and post-conflict country, such as Nepal, with formal welfare institutions remaining uncommon and even family-supporting structures being stretched due to population shift, it is critical to understand why this demographic shift can have such a significant impact on dependency ratios, life expectancy, and disability of elderly people (Speck & Müller-Boker, 2020).

The age distribution in Nepal in the past had been highly fertile, with a high number of young dependents who survived to old age with very few ageing years. The total fertility has decreased significantly over the last 30 years, and the increases in longevity have become solidified by the achievements in primary health care, the growth of immunization coverage, and better access to basic services (Ministry of Health and Population, 2022; Dumka et al., 2024). The population pyramid is gradually transforming into a more rectangular shape, and the rate of population ageing, although still slower than in certain neighboring countries, is definitely increasing (KC et al., 2021; United Nations, 2022). These population shifts are manifested through growing old-age dependency rates, as well as a greater focus in national development strategies and social protection policies (Harasty & Ostermeier, 2020). On the national level, this reconfigured demographic is an indication that the time to enjoy the benefits of a demographic dividend could run out sooner than expected unless the government undertakes concerted efforts to reform health, education, employment and other social protection.

Dependency ratios describe Nepal's changing demographics. The dependency ratio of older people to working-age people is expected to increase dramatically, despite the fact that the country is still in the early stages of the aging process (United Nations, 2022; World Bank, 2023). Due to decreased fertility, old-age dependency is becoming the defining feature of the overall dependency load, which affects the labor

market, family economics, and state budget (Abbas et al., 2024; Dhakal et al., 2024; Shrestha et al., 2021). Demographic aging, however, entails not only dependency but also social and economic participation, as older people often engage in communal activities, farming, and unpaid care, in addition to being dependents (Tausig & Subedi, 2022).

The ageing of the population in Nepal is largely due to the growth of the lifespan of the population due to the important changes in the control of infectious diseases, health of mothers and children, as well as in part due to improved chronic disease management (Cambois et al., 2023). However, as multimorbidity and the shift to noncommunicable diseases (NCDs) raise concerns about the quality of additional years, healthier lives do not always translate into longer lifespans (Zou et al., 2022; Abebe et al., 2020). According to the data, a considerable amount of later life can be characterized by functional limitation, chronic illness, or disability (Ahmad et al., 2023; Sharma & Shakya, 2025). For this reason, it is important to ask whether morbidity is expanding or contracting in Nepal and whether there are enough health services available to support the growing number of cases of long-term care and chronic disease management.

Older adults with disability in Nepal are a serious but poorly studied problem. Noncommunicable diseases, injuries and the disadvantages of a lifetime of poverty, poor dieting, low education and physically demanding labor cause high rates of physical, sensory and functional impairment. Not only are rural inhabitants and people with limited resources or lack of access to health services disproportionately affected, but out-migration of younger family members only increases social isolation and caregiving issues. Although the subject of demographic indicators and dependency ratios in relation to life expectancy and the lived experience of disability is becoming more popular, little research exists (Acharya et al., 2023; Risal et al., 2020).

Methods and Procedures

Research Design

The study's research design was descriptive and analytical, intending to investigate demographic changes and ageing trends in Nepal between 1991 and 2021. It is a quantitative study that examines trends in demographic composition, dependency ratios, life expectancy, and disability among older persons. The article employs secondary data in order to provide a comprehensive understanding of the aforesaid shift from a youth-dominated population to an ageing society, as well as the implications for health and social policies.

Data Source

The research utilizes secondary data based on the Census data of Nepal of 1991, 2001, 2011 and 2021. The census contains the information related to survival and life expectancy at 60 years old in detail. These data on population size, age composition, dependency ratios, regional distribution of older adults and prevalence of disability amongst persons aged 60 and above are nationally representative.

Study Population

This paper is concerned with older people in Nepal aged 60 years and over, with reference to younger age groups (0-14 and 15 -59 years), to evaluate the overall demographic transition. The analysis is further done on regional variations among the provinces, ecological areas and districts in order to find out the spatial patterns of ageing and health outcomes of these.

Variables

The research was based on dependent and independent variables. The old-age dependency ratio, life expectancy at 60 and prevalence of disability in old age were key dependent variables. The independent variables are age, sex, year of census, province, and ecological zone and district.

Data Analysis

Descriptive statistical analysis was performed on the information. To demonstrate age composition changes, survival to age 60 and prevalence of disability, the percentage distributions were calculated. Time trends were examined to bring out changes in population structure, dependency ratios and ageing indexes. A comparative study between provinces, ecological regions, and districts was conducted in an attempt to determine the regional differences regarding the ageing population. The findings were more comprehensible to policymakers and academics because of the clear presentation of the temporal and spatial patterns in tables.

Procedure

The study included a number of methodical techniques. First, relevant datasets and tables were taken from NPHC publications. Data cleaning ensured consistency across age groups and verified annual population balancing. Standard formulas were used to determine important demographic indicators, such as the index of ageing, the old-age dependence ratio, and the overall dependency ratio. The population distribution, survival, life expectancy, and disability by year, sex, province, and ecological zone were then totaled using tabular representations. Finally, the patterns and trends were interpreted in light of Nepal's demographic shift and the policy implications for social and health planning.

Ethical Considerations

Since the research was based on the use of solely publicly available secondary data, it did not imply any encounter with human subjects. The ethical standards were ensured because the data sources were properly cited and no data misrepresentation was made.

Results and Discussion

Results

Composition of Population by Size and Growth

Structure of the population in terms of size and increase. Table 1 reflects the structure and demographic development of the Nepalese population between 1991 and 2021 in terms of broad age ranges. The percentage of the age group 014 years was decreasing consistently during the last 30 years, reaching a minimum of 27.8 percent in 2021, which is a sign of the continuous decline in fertility and reduction in the number of young people. On the other hand, the proportion of the working-age population (15-59 years) rose from 51.8 to 62, and this portrays a demographic transition of the population to a bigger labor force that may have the potential of boosting economic growth.

Table 1

Population Composition and Growth of Broad Age Groups in Nepal: 1991, 2001, 2011, 2021

Years	1991		2001		2011		2021	
Age group	Total population	%	Total population	%	Total population	%	Total population	%
0–14	7,840,771	42.4	8,948,587	39.4	9,248,246	34.9	8,115,575	27.8
15–59	9,579,092	51.8	12,310,968	54.1	15,091,848	57.0	18,071,685	62.0
60+	1,071,234	5.8	1,477,379	6.5	2,154,410	8.1	2,977,318	10.2
Total	18,491,097	100	22,736,934*	100	26,494,504	100	29,164,578	100

Source: National Population and Housing Census (NPHC) 1991, 2001, 2011, 2021

The older adult population (60 and above) increased in Nepal between 5.8% in 1991 and 10.2% in 2021, which illustrates the fact that the Nepalese population is gradually ageing, and the issue of elderly care, social security, and health-related demands is becoming more prominent. The general population growth is clear, and the total population grew by 18.5 million from 1991 to 29.2 million in 2021. The trends indicate that Nepal is moving towards an ageing society and out of the youth-dominated society, which presents the dependency ratio implications, resource allocation, and policy planning. These transitions provide a clear need to plan for the

ageing population, taking the opportunity of the demographic dividend of the growing working-age population.

Districts with the Highest and Lowest Proportions of Elderly Population

Table 2 displays the 15 districts in Nepal with the highest and lowest percentages of the population aged 60 and up in 2021. The statistics show that there is a great regional difference in the distribution of the older population. Gorkha has the greatest level of old age at 17.1 percent, followed by Ramechhap at 16.92 percent and Lamjung at 16.75 percent, indicating that the high population of the hilly and mid-hill regions was older. Conversely, Dolpa exhibits the lowest percentage of 6.19 percent, and Jumla (6.85%) and Jajarkot (6.95%) also have the lowest percentages; hence, remote mountain and a few parts of the Terai districts have lower population ageing and younger age structures.

Table 2

Nepal's 15 Districts with the Highest and Lowest Populations of People Aged 60 and up in 2021

S.N.	Districts with the highest % of 60+ population	Number	%	S.N.	Districts with the lowest % of 60+ population	Number	%
1	Gorkha	42,937	17.10	1	Dolpa	2,650	6.19
2	Ramechhap	28,818	16.92	2	Jumla	8,111	6.85
3	Lamjung	26,113	16.75	3	Jajarkot	13,154	6.95
4	Syangja	41,354	16.34	4	Mugu	4,830	7.48
5	Dolakha	27,423	15.87	5	Kalikot	11,280	7.76
6	Parbat	19,657	15.01	6	Banke	46,968	7.78
7	Sindhupalchok	39,001	14.85	7	Surkhet	20,613	8.05
8	Gulmi	36,142	14.66	8	Rautahat	66,256	8.14
9	Myagdi	15,274	14.27	9	Bara	64,099	8.39
10	Nuwakot	37,578	14.26	10	Parsa	55,556	8.48
11	Okhaldhunga	19,757	14.15	11	Kathmandu	174,057	8.52
12	Dhading	45,573	13.99	12	Humla	4,730	8.53
13	Arghakhanchi	24,562	13.87	13	Salyan	33,426	8.64
14	Manang	764	13.50	14	Dang	58,435	8.65
15	Khotang	23,364	13.32	15	Bhaktapur	38,146	8.82

Source: NSO,2024

Trends in Dependency Ratios and the Aging Index

Table 3 indicates that the dependency ratio and index of ageing indicate the demographic strains in relation to the ageing population of Nepal. On the national level, the overall dependency ratio in the form of 60+ population is 61.38, and the child dependency is 44.91 and the old-age dependency of 16.48, which suggests that older adults are increasingly becoming dependents. The ageing index of 36.69 percent also highlights the increasing ageing ratio between older people and children. The provincial distinctions are highly accentuated. Gandaki Province is the province with a high old-age dependency ratio (21.25%), index of ageing (55.9%), and with a rapidly ageing population (compared to Karnali and Madhesh), whereas Karnali and Madhesh have lower indices (24.06% and 27.57%, respectively), indicating a younger population structure. Province with high ratios of child dependency, e.g., Madhesh (57.5%), is also a reflection of the general burden of youth, but provinces with low indices of total dependency, e.g., Bagmati (48.85), though with a high index of ageing (48.3), are a reflection of the combined impact of falling fertility and rising longevity.

Table 3

Trend of Dependency Ratio and Ageing Index - 2021

	Based on the age of 60+				Based on the age of 65+			
Area	**Total dependency ratio**	**Child dependency ratio**	**Old-age dependency ratio**	**Index of ageing**	**Total dependency ratio**	**Child dependency ratio**	**Old-age dependency ratio**	**Index of ageing**
Nepal	61.38	44.91	16.48	36.69	53.28	42.65	10.63	24.91
Province								
Koshi	59.25	41.38	17.86	43.16	50.38	39.08	11.3	28.92
Madhesh	73.35	57.5	15.85	27.57	65.23	54.81	10.42	19.01
Bagmati	48.85	32.94	15.91	48.3	41.55	31.33	10.22	32.63
Gandaki	59.27	38.02	21.25	55.9	49.41	35.67	13.75	38.54
Lumbini	61.51	46.06	15.44	33.53	53.82	43.87	9.95	22.69
Karnali	69.68	56.17	13.52	24.06	61.88	53.58	8.29	15.48
Sudurpashchim	67.95	52.09	15.86	30.46	60.17	49.67	10.5	21.14

Sources: NSO,2024

On the whole, this data indicates that the process of ageing is unevenly distributed in Nepal, and it has certain implications on social policy, healthcare planning and resource allocation to support both older adults and children.

Percentage of Survival to Age 60 per Ecological Zone and Province

Percentage of Local Area to Age 60 by Ecological Zone and Province, Table 4 displays the percentage of Nepal's population that survived to the age of 60 per ecological zone and province. Nationwide, 80 percent of the population lives to reach 60 years, and women (84.7 percent) live significantly better than men (75.1 percent). The Hill region has the highest survival (81.2% overall; 86.4% women), whereas the Tarai has the lowest (79% overall; 74.4% men), hence a difference in the health outcomes and life expectancy between regions. Provincial analysis. Provinces with the highest survival to age 60 (82.6% both sexes; 87% women) are Bagmati Province and Lumbini Province has the lowest (76.8% both sexes; 70.6% men). The socioeconomic status, access to healthcare services, and life and environmental aspects differ across the provinces and ecological regions. Altogether, the statistics show that the women outlive the men and that there are more chances to survive in the hilly and urbanized provinces, which reflect the area of specific health intervention and planning policies related to ageing.

Table 4

Percentage of Surviving to Age 60 by Ecological Zone and Province, 2021 Census, Nepal

Area	Both sex	Women	Men
Nepal	80.0	84.7	75.1
Ecological zone			
Mountain	80.6	84.3	77.0
Hill	81.2	86.4	75.9
Tarai	79.0	83.5	74.4
Province			
Koshi	78.5	83.2	73.9
Madhesh	81.1	83.9	78.3
Bagmati	82.6	87.0	78.3
Gandaki	80.5	87.0	73.4
Lumbini	76.8	82.7	70.6
Karnali	81.7	86.0	77.2
Sudurpashchim	79.1	85.3	72.4

Source: NSO,2024

Remaining Life Expectancy

Table 5 shows the remaining life expectancy at age 60 in Nepal regions and ecological zones. At the national level, those over 60 have a life expectancy that is 19.4 years longer, and women will live longer than men (18.2 years) at a rate of 20.7 years,

making their overall lifespan biased in favor of women. The age 60 life expectancy is highest in the Mountain area (20.7 years for both sexes, 22.3 years for women) and lowest in the Tarai (19 years for both sexes, 18 years for men), indicating regional disparities in living circumstances, health, and nutrition.

Table 5

Life Expectancy at Age 60, according to Ecological Zones and Provinces

Area	Both sex	Women	Men
Nepal	19.4	20.7	18.2
Ecological zone	**Both sex**	**Women**	**Men**
Mountain	20.7	22.3	19.2
Hill	19.7	21.2	18.3
Tarai	19.0	20.0	18.0
Province	**Both sex**	**Women**	**Men**
Koshi	19.3	20.5	18.2
Madhesh	19.6	20.3	19.0
Bagmati	19.3	20.7	18.0
Gandaki	20.0	21.4	18.6
Lumbini	18.8	20.0	17.7
Karnali	19.8	21.5	18.3
Sudurpashchim	19.8	21.9	17.8

Source: NSO,2024

Table 5 shows that at the province level, Sudurpashchim and Karnali have higher life expectancies for women (21.9 and 21.5 years, respectively), whereas Lumbini Province has the lowest (17.7 years). According to statistics, women live longer than men, and to address regional inequalities in older adult survival and life expectancy, particular health and social interventions are required.

Disability Status of the Nepalese Elderly

Table 6 shows the disability status of older adults in Nepal in 2021, with an age of 60 years and above. Among the total number of the elderly population (n=2,977,318), 206,036 (6.9 percent) had any form of disability. The most prevalent (60,739 cases) was physical disability, and the visual impairment -low vision (55,786) and blindness (6,646). There were cases of 49,252 older adults with impaired auditory (deafness and hearing difficulty). In general, the prevalence of disabilities in men was slightly higher in comparison with that of women (104, 238 men compared to 101, 798 women), but women were more affected by low vision and mental/psychosocial disabilities. Moreover, 14,245 aged adults indicated that they had multiple disabilities, which implied that they needed complex and combined care. Most older adults (2,770,100)

said they had no disability, indicating that disability is not prevalent among Nepal elderly people, given that it is important. These results ensure the effectiveness of the targeted interventions in the form of healthcare, social protection, and access with older adults with disabilities.

Table 6

Disability Status of Elderly People in Nepal, 2021

Disability and types	Men	Women	Total
Population with Disability	104,238	101,798	206,036
Physical disability	34,242	26,497	60,739
Low vision	25,729	30,057	55,786
Blind	3,023	3,623	6,646
Deaf	12,167	11,449	23,616
Hard of hearing	12,875	12,761	25,636
Deaf and Blind	2,078	2,335	4,413
Speech problem	4,174	3,712	7,886
Mental or Manosamajik	1,368	2,298	3,666
Intellectual disability	590	1,020	1,610
Hemophilia	520	493	1,013
Autism	207	573	780
Multiple disability	7,265	6,980	14,245
No disability	1,339,108	1,430,992	2,770,100
Not reported	561	621	1,182
Total senior citizens (≥60)	**1,443,907**	**1,533,411**	**2,977,318**

Source: NSO, 2024

Discussion

This article examined demographic transition in Nepal in terms of an aging society vs a previous demographic dominated by youth in terms of age structure, dependence ratios, survival at older ages, life expectancy at age 60, and disability in old age. The results demonstrate a sharp decrease in the share of children, an increasing percentage of working-age adults and a continuously increasing number of the aged population with a considerable regional and gender inequality in life expectancy and disability. These trends are consistent with the general trends in demographic transition in low- and middle-income countries, which are experiencing a late but rapid demographic transition, but they also have some distinct weaknesses due to Nepal's geography, migration patterns, and lopsided social and health development.

Youth Bulge to Ageing Society

The decline in the 0-14 years population of 42.4 percent in 1991 and 27.8 percent

in 2021 and the corresponding increase in working age population of 3.4 percent in 1991 and 6.4 percent in 2021 as well as the growth in 60 or above years of 5.8 percent in 1991 and 10.2 per cent in 2021 is a testament that Nepal is already in the later phases of demographic transition. Very comparable trends have been observed in South Asia and other developing areas: decreasing fertility, growing working-age groups, and increasing proportions of old-age (Sapkota et al., 2025; United Nations, 2022). These developments go in line with the declining total fertility rates, growing educational levels, and improved health access in Nepal (Government of Nepal, National Planning Commission, 2020; World Bank, 2023).

The increasing number of the elderly population is an opportunity and a challenge. On the one hand, the higher working-age ratio, compared to children, can create a possible demographic dividend as observed in the regional studies of age composition and economic developments (Mason & Lee, 2011; Sapkota et al., 2025). Conversely, this progressive growth in the elderly population, particularly those who live to live long, is an indicator that there will be a significant rise in the demand of health care, long-term care, and social protection (Chalise, 2023; World Health Organization, 2020). Current evidence indicates that Nepal is both at the same time at tail-end of the youth bulge and also at the beginning of the population ageing, having little time to reform its institutions to meet the demands of an ageing society, which is reflected in other lower-middle-income economies (Harper, 2016).

Dependency Ratios and Regional Differentials

A national old-age dependency rate of 16.48, child dependency rate of 44.91 and total dependency rate of 61.38 using the 60-plus-year-old as the standard indicates the society in which younger dependents still predominate but where older dependents increasingly stand out. The ageing index of 36.69% shows that older people have already occupied a large percentage in comparison with children. South Asian countries have also observed studies that have reported a negative child dependency ratio and a gradual yet constant increase in old-age dependency with significant implications for intergenerational transfers and pension systems (Wachs et al., 2020).

The trends of provincial inequality, i.e., the higher old-age dependence, index of the ageing process in Gandaki Province, and the lower values in Karnali and Madhesh, are similar to those in other multi-ethnic, geographically diverse countries, where fertility, migration, and mortality vary by region (Sapkota et al., 2025). The higher proportions of older adults in hill districts (such as Gorkha, Ramechhap, and Lamjung) are likely a combination of reduced fertility and enduring youth out-migration, evidenced by other research on internal and international labor migration of mountain and hill areas (Tausig & Subedi, 2022). Conversely, these lower proportions

of older adults in Dolpa, Jumla, and Jajarkot could be attributed to higher fertility, earlier deaths, or both, as the poorer access to health services and more deplorable living conditions in

The demographic variations, or, in other words, differences in ageing rates and dependency ratios, prove why subnational planning is better than national policies of the same nature. Geriatric and social care should be increased in provinces with high old age dependency; maternal and child health, education and employment should be more heavily invested in regions with high child dependency. Likewise, evidence on South Asia shows that it is appropriate to tailor interventions to local demographic and socioeconomic contexts (Chand, 2018).

Life Expectancy at Older Ages

In Nepal, there is evidence of sex and regional inequality in patterns of survival and longevity. Women have a better chance to live up to 60 (84.7 vs. 75.1) and live longer (20.7 vs. 18.2 years), which is a well-established female longevity benefit recorded worldwide (Barford et al., 2006; World Health Organization, 2020). There is significant geographical variation: high survival rates are observed in hill regions and provinces such as Sudurpashchim, while the Tarai is lagged in by the Tarai, particularly men. According to the previous research, these disparities are attributed to differences in exposure to non-communicable diseases, environmental hazards, and socio-economic disparities (Ghimire et al., 2021). These tendencies suggest that ageing is uneven in Nepal, and the policies should be region and gender sensitive (Beard et al., 2016).

Disability in the Aging Population

About 6.9% of the older adults respond with at least one disability, physical, visual and auditory impairments being the most prevalent, which is in line with global trends in ageing-related disability (World Health Organization, 2011; United Nations, 2022). Gendered disparities can be found: there are more cases of total disability among men than women, although they have higher rates of specific disabilities, which is consistent with the finding that women live longer, but with more functional impairments (Lee et al., 2021). The Complex health and care requirements are highlighted by the presence of many disabilities in the elderly (over 14,000 older adults) (Barnett et al., 2012).

Implications on Policy and Research

The demographic transition in Nepal, increased dependency on old age, and the lack of regional equity are also indicative of the necessity to increase social security, incorporate chronic care, rehabilitation, and disability-focused services (World Health Organization, 2017; HelpAge International, 2019). Specific measures of high-risk areas

and increased availability of assistive technologies and age-friendly environments are necessary. There are empty spaces in research, especially longitudinal data, analyses with disability as a dependent variable in relation to the social and economic conditions, to provide the population with equal and healthy ageing in the nation (Wagg et al., 2021).

Conclusion

The Nepal population is living through a significant demographic shift towards an ageing population, although the general population is comparatively young. Ageing is not uniform at both geographical locations and sex, with significant disparities in survival to 60 years, life expectancy and disability. It is based on these inequalities that the reason why health systems, social protection programs, and development planning must be adjusted to the necessity of an ageing population is urgent.

There are three major insights in this study. To begin with, the increased percentage of the workforce due to the ageing population leads to a decreased demographic dividend, but provides an opportunity to prepare systems in advance with an ageing population. Second, there are significant differences in old-age dependency, survival, and disability between provinces and ecological zones that prove the relevance of regionally and locally specific policies. Third, the high levels of functional limitations, especially amongst women and in certain provinces, underline the need to enhance geriatric and rehabilitative services, foster disability-inclusive social protection and develop community-based care.

Although the study is based on cross-sectional census data, which does not include detailed clinical measures, it is national and provides disaggregated data that is essential in policy planning. Long-term longitudinal research incorporating both demographic, health and socioeconomic variables is necessary to outline evidence-based interventions to facilitate longer, healthier, more independent and dignified lives of the older population in Nepal.

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