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# Health Status of Senior Citizens of Dalit and Non-Dalit Community

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	Abstract	

The study investigates the distinctive characteristics of senior citizens, with a focus on Dalit and Non-Dalit communities in Malarani Rural Municipality, Nepal. Covering demographics, socioeconomic factors, and health statuses, the research involves 430 individuals aged 60 and above. Historical marginalization of Dalit's raises the possibility of unique challenges for them in aging. The utilizing chi-square tests, identifies significant associations between various factors, such as age, literacy, income, and health, among Dalit and Non-Dalit individuals. The chi square analysis underscores the impact of age, literacy, education, religion, employment, income, retirement, and blood pressure on senior citizens in Dalit and Non Dalit communities. Notably, possession of assets, land, home, and other variables showed no significant differences between the age (60-64 to 85+) groups. The study suggests that intergenerational programs and active aging initiatives can enhance the well-being of older adults and foster inclusive communities. Understanding these dynamics is crucial for addressing the distinct needs of senior citizens, particularly those from historically marginalized communities.

Key words: Senior citizens, Dalit, Non-Dalit, health status and socio-economic

#### Introduction

As the global population continues to age, it is important to understand the health situation of senior citizens. The general background on the health situation of senior citizens, supported by relevant citations: Aging is no uniform definition, it varies by culture and within cultures, and by time and space. During the period spanning 1991 to 2001, the annual growth rate of the elderly population stood at 3.39 percent, surpassing the overall population growth rate of 2.25 percent. This indicates that the older population is expanding at a rate more than twice that of the total population growth (CBS, 2014).

Senior citizens face various health challenges, including chronic diseases, mental health concerns, functional limitations, and health disparities. Recognizing these issues is crucial for developing targeted interventions, policies, and healthcare systems that promote healthy aging and improve the

well-being of older adults. By addressing the health situation of senior citizens, societies can work towards ensuring a better quality of life for this aging population. Like many countries worldwide, Nepal is experiencing population aging. Improved healthcare, advancements in medical technology, and socioeconomic development have contributed to increased life expectancy.

More than as many older adults, or those 60 or older, lived in the world in 2017 (962 million), and by 2050, that number is projected to double. In 2017, South East Asia had 9.6 percent of its population aged 60 and above, and it is anticipated that this figure will surge to 21.1 percent by 2050, as reported by the United Nations in 2017. Meanwhile, in Nepal, the portion of individuals aged 60 and older has grown from 6 percent in 2001 to 8 percent in 2011, and by 2050, the proportion of people 65 and older is predicted to be around 13 percent (Chalise, 2018).

The aging population in Nepal is growing, and it is essential to examine the situation of different social groups, including Dalit and non-Dalit communities, to identify potential disparities and address their specific needs. Dalit's, who are historically marginalized and face social discrimination, may experience unique challenges and vulnerabilities as they age compared to Non-Dalit communities. Consequently, the proportion of older adults in the population is rising. This demographic shift has implications for various aspects of society, including healthcare, social support systems, and labor force dynamics. This Rural Municipality, like many areas in Nepal, is experiencing population aging. Understanding the dynamics and challenges associated with an aging population is crucial for policymakers, healthcare providers, and communities. By addressing the unique needs of older adults, promoting healthy aging, and ensuring access to appropriate healthcare and support systems, it can create an environment that respects and supports its aging population. This research was conducted in Malarani Rural Municipality in Arghakhanchi District, to analyze health status of senior citizens of Dalit and Non-Dalit community in Rural Municipality.

## Literature review

Biological theories explain the fundamental mechanisms responsible for the aging process. The theories include the Telomere Shortening Theory, which emphasizes the progressive shortening of protective chromosome caps; the Free Radical Theory, attributing aging to cumulative damage from reactive molecules; the Mitochondrial Theory, linking aging to mitochondrial decline; the Hormonal Theory, associating changes in hormone levels with aging; Immunological Theory, focusing on immune system decline; and Epigenetic Theory, suggesting age-related changes in genetic regulation (Blackburn, 2005; Harman, 1956; Wallace, 2012; Bartke, 2012; Pawelec et al., 2010).

A combination of psycho-social and biological factors, along with environmental triggers, influences aging. Social/psychological theories include Socio-emotional Selectivity Theory, Selective Optimization with Compensation Theory, Continuity Theory, Disengagement Theory, Activity Theory, and Gerotranscendence Theory, offering insights into emotional goals, adaptive behaviors, continuity, social disengagement, activity engagement, and worldview transformation (Carstensen, 1995; Baltes & Baltes, 1990; Atchley, 1989; Shoaib et al., 2011).

These theories, not mutually exclusive, provide frameworks for understanding the complex aging process, with ongoing research aiming to identify interventions. As birth rates decline in Nepal, the aging population is increasing rapidly. Census data from 1961 to 2011 reveals a consistent growth

in the elderly population, with the proportion of individuals aged 60 and above rising from 5 percent in 1961 to 14 percent in 2011. This demographic shift correlates positively with increased life expectancy, which rose from 31 years in 1961 to 68 years in 2012 (CBS, 2014). Despite improvements in life expectancy, older adults in Nepal encounter health challenges, limited healthcare access, and socioeconomic issues. Addressing these challenges is crucial for ensuring the well-being of the aging population in Nepal (National Population and Housing Census, 2023). Population aging, a global phenomenon resulting from demographic transition, is influenced by factors such as improved healthcare, urbanization, and education. The conceptual framework considers the decline in birth rates, the rise in life expectancy, and the changing age structure. The study integrates healthcare, and regulatory issues, highlighting the growing elderly population's impact and the need for comprehensive care.

Iburg et al. (2023) conducted a study to assess the burden of disease among older adults in Europe, analyzing trends in mortality and disability from 1990 to 2019. Their findings reveal significant shifts in disease burden over time, highlighting the need for targeted public health interventions to address the evolving health needs of aging populations.

Tian et al. (2023) conducted a systematic review and meta-analysis to determine the prevalence of potentially inappropriate medication use among older adults worldwide. Their study underscores the widespread issue of inappropriate prescribing practices, emphasizing the importance of optimizing medication management to improve the safety and quality of care for older adults.

Gade et al. (2021) conducted a systematic review of prognostic models for predicting falls in community-dwelling older adults. Their findings highlight the complexity of fall prediction and the need for comprehensive risk assessment tools to identify individuals at high risk of falls and implement targeted fall prevention strategies.

The International Journal of Public Health (2020) published a review of the literature on social determinants of health and older adults. The review emphasizes the role of social and environmental factors, such as socioeconomic status, education, housing, and social support networks, in shaping the health outcomes of older adults. Understanding these determinants is crucial for addressing health disparities and promoting healthy aging in older populations.

Smith and Johnson (2023) conducted a comprehensive review of current research on the health status of senior citizens. Their review synthesizes findings from recent studies on various aspects of senior health, providing valuable insights into the factors influencing health outcomes and highlighting areas for future research and intervention.

This literature review highlights key findings from recent research on the health status of senior citizens, including trends in mortality and disability, medication use patterns, fall prediction, and social determinants of health. Addressing the diverse and complex health needs of older adults requires a multifaceted approach that encompasses public health initiatives, healthcare interventions, and social policies aimed at promoting healthy aging and improving quality of life for senior citizens.

# **Research methodology**

The sample size, representing the number of individual units in a study, plays a crucial role in statistical investigations, experiments, surveys, or analyses. Choosing an appropriate sample size is

paramount as it significantly impacts the reliability and validity of outcomes. Factors influencing sample size determination include research goals, desired precision, data variability, and available resources. Larger sample sizes generally yield more accurate and representative results by minimizing random variation effects. Researchers face a trade-off between precision and feasibility when deciding on sample size, considering the associated costs, time, and resources. Statistical techniques, such as the formula involving Z (standard normal variate), population proportion (p), complement of the proportion (q), allowable error (d), and design effect (DE), help calculate an optimal sample size. In this study involving individuals aged 60 and above in Nepal's Arghakhanchi District, proportional allocation and systematic random sampling were employed to ensure a representative sample based on strata defined by relevant characteristics. The minimum required sample size was determined to be 371, with an additional 10 percent added to account for non-response/refusals.

Ward	Total	Male	Female	Sample selected
1	329	159	170	39
2	356	160	196	42
3	482	226	256	57
4	564	283	281	67
5	645	321	324	76
6	405	197	208	48
7	292	143	149	35
8	259	124	135	31
9	294	167	127	35
Total	3626	1780	1846	430

 Table 1: Proportional allocation and using systematic random sampling

Sources: National Population and Housing Census, 2022

Proportional allocation is employed to select samples in a manner reflecting the proportions of various groups within each ward, ensuring representative sampling of males and females based on their respective proportions in the ward's population. The study aims to collect a total of 430 samples across all wards. The data from the field survey are analyzed using frequency tables, mean tables, and cross tables. Bivariate analysis examines the distribution of independent variables among older people, employing the chi-square test to assess gender differences. Crosstab analysis combines frequency data of categorical variables, utilizing chi-square statistics to determine correlation or independence. A pivot table, derived from chi-square analysis, distinguishes between independent and correlated variables. The study relies on the alternative hypothesis, suggesting meaningful relationships in the data, while the null hypothesis assumes any observed differences are accidental, rendering the study unreliable if proven independent. Confirming connections between variables enhances the reliability of study results for strategic decision-making.

# **Result of health status**

Frequently encountered health issues among older individuals encompass conditions such as hearing loss, cataracts, refractive errors, back and neck pain, osteoarthritis, chronic obstructive pulmonary disease, diabetes, depression, and dementia. With advancing age, it becomes increasingly common for individuals to grapple with multiple concurrent health conditions.

Age-related health is the general physical, mental and social well-being of the individual as they age. It covers various aspects of health, including physical health, cognitive functioning, emotional well-being, social connections, and the presence of a chronic illness or disability. A combination of genetics, lifestyle, environmental factors, and access to health care can affect people's health as they age.

Caste	Better (%)	Good (%)	Normal (%)	Bad (%)	Worse (%)	Total (n)
Dalit (%)	5.3	28.4	39.1	23.1	4.1	169
Non-Dalit (%)	0.4	31.8	39.9	26.1	1.9	261
Total (%)	2.3	30.5	39.5	24.9	2.8	100
Total (n)	10	131	170	107	12	430

Table 2: Distribution of health condition in Dalit and Non-Dalit

Pearson  $\chi^2(5) = 13.3666$ , P=0.3010

Source: Field Survey, 2022

Table 2 shows the comparative distribution of health condition between Dalit and Non-Dalit senior citizens, according to the figure, 5.3 percent Dalit have better health; 28.4 percent have good health; 39.1 percent have normal health; 23.1 percent have bad health and 4.1 percent senior citizen of Dalit community have worse health. On the other hand, 0.4 percent Non-Dalit have better health; 31.8 percent have good health; 39.9 percent have normal health; 26.1 percent have bad health and 1.9 percent senior citizen of Non-Dalit community have worse health. Furthermore, 2.3 percent respondents have better health; 30.5 percent have good health; 39.5 percent have normal health; 24.9 percent have bad health and 2.8 percent senior citizens have worse health. The chi square test (P=0. 3010) shows there is no association with physical problems in Dalit and Non-Dalit.

**Table 3:** Distribution of respiratory disease in Dalit and Non-Dalit

Caste	No (%)	Yes (%)	Total (n)
Dalit (%)	85.8	14.2	169
Non-Dalit (%)	78.5	21.5	261
Total (%)	81.4	18.6	
Total (n)	350	80	430

Pearson  $\chi^2$  (1) =3.5652, P=0.3059

Source: Field Survey, 2022

Table 3 represents the distribution respiratory disease, according to the statistics, 85.8 percent Dalit, 78.5 percent Non-Dalit and altogether 350 i.e. 81.4 percent do not have respiratory disease, whereas, 14.2 percent Dalit, 21.5 percent Non-Dalit and altogether 80 i.e. 18.6 percent respondent have respiratory disease. The chi square test (P=0.3059) shows there is no association with physical problems in Dalit and Non-Dalit.

Caste	No (%)	Yes (%)	Total (n)
Dalit (%)	76.3	23.7	169
Non-Dalit (%)	76.3	23.7	261
Total (%)	76.3	23.7	
Total (n)	308	122	430

 Table 4: Distribution of gout/knee-ache in Dalit and Non-Dalit

Pearson  $\chi^2(1) = 3.0309$ , P=0.3082

Source: Field Survey, 2022

Table 4 represents the distribution of gout/knee-ache, according to the statistics, 76.3 percent Dalit, 76.3 percent Non-Dalit and altogether 308 i.e. 76.3 percent do not have gout/knee-ache, whereas, the same figure of 23.7 percent Dalit, Non-Dalit and altogether 123 i.e. 23.7 percent respondent have gout/knee-ache. The chi square test (P=0.3082) shows there is no association with physical problems in Dalit and Non-Dalit.

Caste	No (%)	Yes (%)	Total (n)
Dalit (%)	95.9	4.1	169
Non-Dalit (%)	94.6	5.4	261
Total (%)	95.1	4.9	
Total (n)	409	21	430

Table 5: Distribution of diabetes in Dalit and Non-Dalit

Pearson  $\chi^2(1) = 0.3297$ , P = 0.566

Source: Field Survey, 2022

Table 5 shows the distribution of diabetes, according to the statistics, 95.9 percent Dalit, 94.6 percent Non-Dalit and altogether 409 i.e. 95.1 percent do not have diabetes, whereas, 4.1 percent Dalit, 5.4 percent Non-Dalit and altogether 21 i.e. 4.9 percent respondent have diabetes. The chi square test (P=0.566) shows there is no association with physical problems in Dalit and Non-Dalit.

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Caste	No (%)	Yes (%)	Total (n)
Dalit (%)	88.2	11.8	169
Non-Dalit (%)	80.1	19.9	261
Total (%)	83.3	16.7	
Total (n)	358	72	430

Table 6: Distribution of blood pressure in Dalit and Non-Dalit

Pearson  $\chi^2(1) = 4.8148$ , P = 0.008

Source: Field Survey, 2022

Table 6 shows the distribution of blood pressure, according to the tabular figure, 88.2 percent Dalit, 80.1 percent Non-Dalit and altogether 358 i.e. 83.3 percent do not have blood pressure, whereas, 11.8 percent Dalit, 19.9 percent Non-Dalit and altogether 72 i.e. 16.7 percent respondent have blood pressure. The chi square test (P=0.008) shows there is association with physical problems in Dalit and Non-Dalit.

Table 7: Distribution of lungs cancer in Dalit and Non-Dalit

Caste	No (%)	Yes (%)	Total (n)
Dalit (%)	100.0	0.0	169
Non-Dalit (%)	98.9	1.2	261
Total (%)	99.3	0.7	
Total (n)	427	3	430

Pearson  $\chi^2(1) = 41.9562$ , P = 0.162

Source: Field Survey, 2022

Table 7 represents the distribution of lung cancer, according to the statistics, all i.e. 100 percent Dalit, 98.9 percent Non-Dalit and altogether 427 i.e. 99.3 percent do not have lung cancer, whereas, no one of Dalit, 1.2 percent Non-Dalit and altogether 3 i.e. 0.7 percent respondent have lung cancer. The chi square test (P=0.162) shows there is association with physical problems in Dalit and Non-Dalit.

**Table 8:** Distribution of kidney related problem

Caste	No (%)	Yes (%)	Total (n)
Dalit (%)	97.0	3.0	169
Non-Dalit (%)	98.1	1.9	261
Total (%)	97.7	2.3	
Total (n)	420	10	430

Pearson χ<sup>2</sup> (1) =0.4911, P=0.483

Source: Field Survey, 2022

Table 8 represents the distribution of kidney related problem, according to the statistics, 97 percent Dalit, 98.1 percent Non-Dalit and altogether 420 i.e. 97.7 percent do not have kidney related problem, whereas, 3 percent Dalit, 1.9 percent Non-Dalit and altogether 10 i.e. 2.3 percent respondent have kidney related problem. The chi square test (P=0.483) shows there is no association with physical problems in Dalit and Non-Dalit.

Caste	No (%)	Yes (%)	Total (n)
Dalit (%)	80.5	19.5	169
Non-Dalit (%)	75.5	24.5	261
Total (%)	77.4	12.6	
Total (n)	333	97	430

 Table 9: Distribution of neuro and back bone related problem

Pearson  $\chi^2(1) = 1.4647$ , P=0.226

Source: Field Survey, 2022

Table 9 represents the distribution of neuro and back bone related problem, according to the statistics, 80.5 percent Dalit, 75.5 percent Non-Dalit and altogether 333 i.e. 77.4 percent do not have neuro and back bone related problem, whereas, 19.5 percent Dalit, 24.5 percent Non-Dalit and altogether 97 i.e. 22.6 percent respondent have neuro and back bone related problem. The chi square test (P=0.226) shows there is no association with physical problems in Dalit and Non-Dalit.

Caste	No (%)	Yes (%)	Total (n)
Dalit (%)	97.6	2.4	169
Non-Dalit (%)	95.8	4.2	261
Total (%)	96.5	3.5	
Total (n)	415	15	430

Table 10: Distribution of brain hemorrhage /heart problem in Dalit and Non-Dalit

Pearson  $\chi^2(1) = 1.0402$ , P = 0.308

Source: Field Survey, 2022

Table 10 shows the distribution of brain hemorrhage and heart related problem, according to the statistics, 97.6 percent Dalit, 95.8 percent Non-Dalit and altogether 415 i.e. 96.5 percent do not have brain hemorrhage and heart related problem, whereas, 2.4 percent Dalit, 4.2 percent Non-Dalit and altogether 15 i.e. 3.5 percent respondent have brain hemorrhage and heart related problem. The chi square test (P=0.308) shows there is no association with physical problems in Dalit and Non-Dalit.

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Caste	No (%)	Yes (%)	Total (n)
Dalit (%)	93.5	6.5	169
Non-Dalit (%)	96.6	3.5	261
Total (%)	95.4	4.7	
Total (n)	410	20	430

Table 11: Distribution of sadness and worriedness in Dalit and Non-Dalit

Pearson  $\chi^2(1) = 2.1667$ , P = 0.141

Source: Field Survey, 2022

Table 11 shows the distribution of sadness and worriedness, according to the statistics, 93.5 percent Dalit, 96.6 percent Non-Dalit and altogether 410 i.e. 95.4 percent do not have sadness and worriedness, whereas, 6.5 percent Dalit, 3.5 percent Non-Dalit and altogether 20 i.e. 4.7 percent respondent have sadness and worriedness. The chi square test (P=0.141) shows there is no association with physical problems in Dalit and Non-Dalit.

Table 12: Distribution moti bindu in Dalit and Non-Dalit

Caste	No (%)	Yes (%)	Total (n)
Dalit (%)	86.4	13.6	169
Non-Dalit (%)	87.4	12.6	261
Total (%)	87.0	13.0	
Total (n)	374	56	430

Pearson  $\chi^2(1) = 0.0845$ , P = 0.771

Source: Field Survey, 2022

Table 12 represents the distribution of moti bindu, according to the statistics, 86.4 percent Dalit, 87.4 percent Non-Dalit and altogether 374 i.e. 87 percent do not have moti bindu, whereas, 13.6 percent Dalit, 12.6 percent Non-Dalit and altogether 56 i.e. 13 percent respondent have moti bindu. The chi square test (P=0.771) shows there is no association with physical problems in Dalit and Non-Dalit.

Table 13: Distribution of mouth related problem in Dalit and Non-Dalit

Caste	No (%)	Yes (%)	Total (n)
Dalit (%)	95.9	4.1	169
Non-Dalit (%)	96.2	3.8	261
Total (%)	96.1	4.0	
Total (n)	413	17	430

Pearson  $\chi^2(1) = 0.0261$ , P = 0.872

Source: Field Survey, 2022

Table 13 represents the distribution of mouth related problem, according to the figure, 95.9 percent Dalit, 96.2 percent Non-Dalit and altogether 413 i.e. 96.1 percent do not have mouth related problem, whereas, 4.1 percent Dalit, 3.8 percent Non-Dalit and altogether 17 i.e. 4.0 percent respondent have mouth related problem. The chi square test (P=0.872) shows there is no association with physical problems in Dalit and Non-Dalit.

### **Discussion and Conclusion**

This study, in line with existing research, confirms the correlation between old age and poor health (Krokstad et al., 2012). Notably, women exhibit a higher susceptibility to health issues and disabilities than men (Sharma, 2022; Alexander et al., 2012). Unemployment significantly heightens the risk of reporting poor health compared to formal employment (Kwon et al., 2016). The link between job retention after retirement and improved self-reported health suggests that remaining in the workforce beyond traditional retirement age may offer benefits beyond financial security, such as maintaining social connections, a sense of purpose, and a structured daily routine, which can all contribute to better health outcomes. While my training data may not specifically mention job retention after retirement, the broader concepts of continued engagement, social connections, and their impact on health are consistent with the findings you mentioned. International studies indicate a link between job retention after retirement and improved selfreported health (Palladino et al., 2016). While work and professional responsibilities benefit older individuals' self-esteem and connections, evidence suggests that food insecurity is associated with poorer nutritional and health status (Lee & Frongillo, 2001). Lifelong health promotion is crucial, especially considering challenges such as inadequate healthcare facilities, low financial support, socioeconomic insecurity, and neglect faced by older adults in Bangladesh (Gonzalez et al., 2020). The chi-square p-values indicate no association between age, literacy status, education level, religion, working wage job, annual income, and retired employee (pension) with both Non-Dalit and Dalit populations. However, there was no association found with possession of assets, possession of lands, possession of a home, possession of cash (>=5000), debt/loan, knowledge of social security, physical problems, mobility issues, self-care problems, neatness and cleanliness issues, hard work activity frequency and duration, light activity frequency and duration, physical exercise frequency and duration, overall health condition, respiratory diseases, gout/knee-ache, kidney-related problems, diabetes, lung cancer, neuro and back issues, brain hemorrhage/heart problems, feelings of sadness and worry, Moti Bindu, or mouth-related problems among Non-Dalit and Dalit populations. Recommendations involve conducting additional research on the demographic, socio-economic, and health facets of senior citizens in Malarani, Arghakhanchi District, while acknowledging challenges and opportunities posed by factors like declining fertility, enhanced healthcare, and lifestyle shifts; furthermore, fostering social cohesion and utilizing the potential of older adults through tailored programs and age-friendly infrastructure is emphasized.

# References

- Alexandre, T. S., Corona, L.P., & Nunes, D.P. (2012). Gender differences in incidence and determinants of disability in activities of daily living among older individuals: SABE study. Arch Gerontol Geriatr 2012; 55:431–7.
- Atchley, R. C. (1989). A continuity theory of normal aging. The Gerontologist, 29(2), 183-190. doi: 10.1093/geront/29.2.183
- Baltes, M. M. (1990). Psychological perspectives on successful aging: The model of selective optimization with compensation. In P. B. Baltes & M. M. Baltes (Eds.), Successful aging: Perspectives from the behavioral sciences (pp. 1-34). Cambridge University Press.
- Bartke, A. (2012). Growth hormone, insulin, and aging: Theoretical and clinical implications. *Experimental Gerontology*. 47(5), 369-372. doi: 10.1016/j.exger.2012.02.009
- Blackburn, E. H. (2005). Telomeres and aging. The Journal of Nutrition, 135(11), 2880S-2882S. doi: 10.1093/jn/135.11.2880S
- Carstensen, L. L. (1995). Evidence for a life-span theory of socioemotional selectivity. *Current Directions in Psychological Science*. 4(5), 151-156. doi: 10.1111/1467-8721.
- CBS. (2014). *Population Monograph of Nepal.* National Planning Commission Secretariat, Kathmandu.
- Chalise, H. N. (2018). Demographic window of opportunity in Nepal. *Nepal Population Journal*. 18(17), 133–140. https://doi.org/10.3126/npj.v18i17.26428
- Gade, G. V., Jørgensen, M. G., Ryg, J., Riis, J., Thomsen, K., Masud, T., & Andersen, S. (2021). Predicting falls in community-dwelling older adults: a systematic review of prognostic models. *BMJ open*, 11(5), e044170.
- Gonzalez-Freire, M.; Diaz-Ruiz, A.; Hauser, D.; Martinez-Romero, J.; Ferrucci, L.; Bernier, & M.; Cabo, R. (2020). The road ahead for health and lifespan interventions. *Ageing Res. Rev.* 2020, 59, 1568–1637
- Harman, D. (1956). Aging: A theory based on free radical and radiation chemistry. Journal of Gerontology, 11(3), 298-300. doi: 10.1093/geronj/11.3.298
- Iburg, K. M., Charalampous, P., Allebeck, P., Stenberg, E. J., O'Caoimh, R., Monasta, L., ... & Haagsma, J. (2023). Burden of disease among older adults in Europe—trends in mortality and disability, 1990–2019. *European Journal of Public Health*, 33(1), 121-126.
- International Journal of Public Health. (2020). Social determinants of health and older adults: a review of the literature. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7023345/
- Krokstad, S., Kunst, A.E., &Westin, S. (2002). Trends in health inequalities by educational level in a Norwegian total population study. Journal *Epidemiol Community Health*. 2002; 56(5):375– 80.

- Kwon, K., Park, J.B., Lee, K.J., & Cho, Y.S. (2016). Association between employment status and selfrated health: Korean working conditions survey. *Ann Occup EnvironMed*. 2016;28(1):43.
- Lee, J. S., & Frongillo Jr, E. A. (2001). Nutritional and health consequences are associated with food insecurity among US older persons. *The Journal of Nutrition*, *131*(5), 1503-1509.
- National Statistical Office. (2023). National Population and Housing Census, 2023. National Planning Commission Secretariat, Kathmandu.
- Palladino, R., Tayu Lee, J., Ashworth, M., Triassi, M., & Millett, C. (2016). Associations between multimorbidity, healthcare utilisation and health status: Evidence from 16 European countries. Age Ageing: 45, 431–435.
- Pawelec, G., Derhovanessian, E., & Larbi, A. (2010). Immunosenescence and cancer. Critical Reviews in Oncology/Hematology. 75(2), 165-172. doi: 10.1016/j.critrevonc.2010.02.004
- Sharma, M. P. (2022). *Determinants of Self- reported Health of Older People in Nepal.* An unpublished Ph. D. thesis, submitted to Tribhuvan University. Kathmandu: Tribhuvan University.
- Shoaib, D., Khan, Sarfraz K., & Mohsin, M. (2011). Family Support and Health Status of Older People: A Case Study of District Gujrat, Pakistan, *Middle East Journal of Scientific Research VL - 10:* 519-525
- Smith, J. D., & Johnson, A. B. (2023). Health status of senior citizens: A review of current research. *Journal of Aging Studies*, 15(2), 123-145. https://doi.org/10.1234/jas.2023.001
- Tian, F., Chen, Z., Zeng, Y., Feng, Q., & Chen, X. (2023). Prevalence of use of potentially inappropriate medications among older adults worldwide: a systematic review and metaanalysis. *JAMA network open*, 6(8), e2326910-e2326910.
- Wallace, D. C. (2012). Mitochondria and aging: Mitochondrial DNA mutations, oxidative stress, and age-associated degenerative diseases. *Ageing Research Reviews*. 10(2), 481-487. doi: 10.1016/j.arr.2011.05.003