THE BURDEN OF MORBIDITY, ASSOCIATED EXPENDITURE, AND LIFE SATISFACTION AMONG GERIATRIC POPULATION IN NEPAL

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ABSTRACT

An increase in life expectancy has raised a concern about whether these extra added years are characterized by good health and independence or health problems and dependency on others for care. Maximum life satisfaction (LS) is necessary to have healthy aging. The current study aimed to analyze the morbidity burden, associated expenditure, and life satisfaction among elderly population. A cross-sectional study was conducted at four different Municipalities of Bhaktapur district from February 1 to Sep 31, 2023 after obtaining ethical approval from Institutional Review Committee. A total sample size was 212 elderly participants above 60 years were included in this study. Stratified sampling method was applied. The questionnaire consisted of: a) socio-demographic b) morbidity and treatment cost c) coping strategy d) life satisfaction (LISAT-11). Descriptive statistics, chi-square ($\chi 2$) test, T-test and Anova was applied. This study involved 212 elderly participants (median age 69), primarily female (56.1%) and mostly from privileged ethnic backgrounds (86.8%).This study highlighted gender disparities, income sources, health conditions, and healthcare costs. Chronic conditions were prevalent among females and illiterate individuals. Cardiovascular issues were common. Females used outpatient services more, while males were hospitalized. Health expenses were significant, mainly covered by insurance and personal savings. Life satisfaction varied based on demographics and lifestyle factors. The elderly population bears a burden of morbidity, marked by a notable presence of health conditions and diseases. This burden leads to considerable personal expenses on healthcare services, especially concerning medication costs. Despite the financial pressures from healthcare expenditures, older individuals exhibit diverse degrees of life satisfaction.

KEYWORDS

Aging, health expenditure, mental health, morbidity, quality of life

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INTRODUCTION

Aging results as a variety of molecular and cellular damage that accumulates over time and causes a steady decline in physical and mental ability, a rise in the risk of illness, and finally mortality.[1] The United Nations suggested using 60+ years to refer to the older population, but most industrialized nations define the "elderly population" as those over 65.[2] By 2030, one in six people in the world will be aged 60 years or over. In 2050, 80% of older people will be living in low- and middle-income countries.[1] The world's populations are aging at a quicker rate than in the past, and this demographic shift will have an effect on practically all facets of society.[3]

The life expectancy in Nepal is in increasing trend, which was about 54 years in 1991 and the average life expectancy is rising by one year in every two years.[4,5] The elderly population accounts for 8.1 % of the total population in our country, where Gandaki Province has the highest (11.8%) and Karnali Province has the least (5.6%) elderly above 60 years.[6] Ageism, according to the United Nations, is a global issue that negatively impacts the health and general well-being of the aged and is linked to poor physical and mental health, greater social isolation and loneliness, financial insecurity, and a diminished quality of life.[7] As people age, their health often deteriorates, which results in higher healthcare costs.[8] The government of Nepal does not have a rigorous policy to ensure availability of specialized geriatric health care for its senior citizen. Traditionally, senior citizens reside with and are taken care of by their children specially sons and daughters-in-law.[9] Sons are the primary source of health care expenditures for older people; 49.0% of older parents' expenses were managed by their son.[10] But the traditional system of joint families has been replaced by a nuclear family, and the internal and external migration of youth leaves behind elderly.[9] There is limited data in Nepal on the health care costs in the elderly population. The current study aimed to analyze the morbidity burden, associated expenditure, and life satisfaction among elderly population.

MATERIALS AND METHODS

A descriptive cross-sectional study was conducted from February to September 2023. Elderly Nepalese citizens living in Bhaktapur District in 4 different municipalities (Bhaktapur, Changunarayan, Madhayapur Thimi, Suryabinayak) were included in this study.

Data collection was started after taking ethical approval from Institutional Review Committee (IRC) of Kathmandu Medical College (KMC) (Ref: 30122022/06). Objectives and purpose of the study was explained clearly to respondents. Information was taken for necessary purposes. Consent was taken. Privacy and confidentiality of information about the individual was strictly maintained. In all respects autonomy of the research participants was fully respected and ensured.

In this study, ethnic group has been classified as privileged (privileged ethnic groups are those that hold a dominant status within a society, often benefiting from systemic advantages e.g. *Brahmin*, *Chettri*, *Janajati*) and under privileged (e.g. *Dalit*).

Both male and female above the age of 60 years were included in the study. Seriously ill, disabled, who could not answer the questions (with dementia) and did not give the consent was excluded from the study.

Sample size: $n = Z^2pq/d^2$

n = sample size

z = level of confidence according to the standard normal distribution (for a level of confidence of 95%, z = 1.96)

p = prevalence of morbidity = 9.77%[11] = 0.0977 (Analyzing the burden of morbidity, associated expenditure, and coping strategies among India's elderly population)

q=1-p=1-0.0977=0.9023

d = tolerated margin of error = 4%

$$n = \frac{(1.96)^2 0.0977 \times 0.9023}{(0.04)^2} = 211.6 \sim 212$$

Stratified sampling method was used. All the eligible participants were subsequently contacted in door-to-door survey. Households with elderly population were selected with the help of Female Community Health Volunteers (FCHVs). In stratified sampling method each municipality represented a stratum. In this study, four municipalities (Bhaktapur, Changunarayan, Madhapur Thimi and Suryabinayak) were selected. To maintain equal representation, the sample size equally allocated among them. Sample size for each municipality = Total sample size / Number of municipalities=212/4=53

53 samples from each of the 4 municipalities (Bhaktapur, Changunarayan, Madhapur Thimi, Suryabinayak). were selected. The data was collected through questionnaire. Questionnaire was asked in the form of interview. Questionnaire was pretested in

Lalitpur Municipality. Necessary changes were made accordingly. The questionnaire consisted of 3 sections: a) socio-demographic b) morbidity and treatment cost c) coping strategy d) life satisfaction

Life satisfaction tool (LISAT-11)[12] was used where it consisted of 11 questions. The highest score was 6 very satisfying, lowest 1 very dissatisfying. The scores were categorized as "low" (score of 5–20), "medium" (score of 21–25), and "high satisfaction" (score of 26–35). After completion of questionnaire survey, data was entered in SPSS-20 and coded for analysis. The analysis included both descriptive and inferential statistics.

Descriptive statistics (frequencies, mean, median, interquartile range and standard deviations) was used to describe the variables of interest. The chi-squared ($\chi 2$) tests were used to assess the associations of socio-demographic factors with the presence of morbidity conditions: chronic condition and with multimorbidity (individuals with ≥2 chronic conditions). T-test and Anova was applied to see the difference of mean of demographic variables with life satisfaction score. In all statistical tests p =0.05 or less was considered statistically significant.

RESULTS

A total of 212 elderly participants were included in the study. The median age of the participants was 69 years old; IQR(10). The majority of the participants were female 119 (56.1%), privileged ethnicity184 (86.8%), married 185 (87.3%), illiterate 126 (59.4%), and lived in a joint family 193 (91.0%). The average household income was Nepali Rs 2,22,160 annually and Nepali Rs 18,513 monthly. The main source of income was their family business 70 (33.0%) and rent 35 (16.5%). The number of the elderly participants who received the old age allowance were 102 (48.1%) (Table 1).

Table 2 depicts life style and habits amongst elderly. Most of the old age participants had good appetite 192 (92.9%). They did physical exercise 180 (84.9%) in form of walking 137 (64.6%). Only 43 (20.3%) were involved in sports but were socially active 145 (68.4%). The elderlies who had smoking and drinking alcohol habits were less. Only 33 (15.6%) had smoking habit and 8 (3.8%) had alcohol consumption habit.

Out of 212 elderly participants, 125 (59.0%) had multi morbidity whereas 87 (41.0%) had a single chronic morbidity. In age group of 65 years, 13 (44.8%) had chronic morbidity and 16 (55.2%) had multi morbidity. Chronic morbidity and multimorbidity was more common among females 119 (56.1%), than males illiterate elderly 126 (59.4%) and among the privileged group 184 (86.4%) (Table not shown).

Most common health system affected was cardiovascular 86 (40.6%). Other commonly affected health systems were endocrine 76 (35.8%), digestive 59 (27.8%), respiratory

Table 1: Socio demographic characteristics of participants (n=212)

Demographic variables	Total n (%)
Age, median (IQR)	69 (10)
Sex	
Male	93 (43.9)
Female	119 (56.1)
Ethnicity	
Privileged	184 (86.8)
Under privileged	28 (13.2)
Religion	
Hindu	172 (81.1)
Buddhist	25 (11.8)
Christian	15 (7.1)
Education	
Illiterate	126 (59.4)
Up to primary	52 (24.5)
Up to secondary	19 (9.0)
Higher secondary and above	14 (6.6)
Graduate and above	1 (0.5)
Marital status	
Married	185 (87.3)
Unmarried	2 (0.9)
Without partner	25 (11.8)
Living arrangements	
Living alone	18 (8.5)
Living with family	193 (91)
Living with others	1 (0.5)
Annual household income, mean	NRs. 222,160
Source of income	
Business	70 (33)
Rent	35 (16.5)
Remittance	10 (4.7)
Agriculture	15 (7.1)
Pension	29 (13.7)
Others	53 (25)
Old age allowance	
Yes	102 (48.1)
No	110 (51.1)

system 57 (26.9%), eye 54 (25.5%), neurology 38 (17.9%), Orthopedics 37 (17.5%) (Fig. 1).

Out of total sample population, only 68 (41.46%) male and 96 (58.54%) females used to take OPD services monthly whereas 21 (61.76%) male and 13 (38.24%) female elderly population were hospitalized within a year of the survey. This shows that OPD service taken by female participants is 1.41 times more in number than males whereas hospitalization among males was 2.62 times more in number than females.

Regarding out-of-pocket expenditure, cost of buying medicines was comparatively higher in both OPD cases and hospitalized cases. The average hospitalized expenses for an old age participant in a year was found Rs. 69,415 annually and the average OPD expenses calculated for an old age participant in a month was Rs. 3,867.

The out-of-pocket expenditure for OPD care is therefore 20.88% of monthly household income. Hospitalized service cost is about 31.25% of annual household income (Table 3). The major source for meeting the health care expenses was insurance 181 (85.4%), their own savings 23 (10.8 %), borrowing money 3 (1.4 %) (not shown in table).

Table 4 shows association of morbidities with various socio demographic variables. It was seen that elderly people living with their families had comparatively more chance of getting ill than those who were alone or living with others (p =0.02). It was found that participants who had a source of income from family business showed a higher prevalence of morbidities compared to those in agriculture and other occupations; this difference was statistically significant (p =0.003).

Similarly, those elderly who were socially active were found to have morbidities. This association was found to be significant (p =0.024) and elderly who take tension in life were found to have more morbidity (p =0.007). No statistically significant difference was found among age, sex of the participants, educational status, marital status, physical activity, smoking and alcohol habit.

Table 2: Life style indicators of elderly

Life style indicators	n (%)
Appetite	
Yes	197 (92.9)
No	15 (7.1)
Physical activity	
Yes	180 (84.9)
No	32 (15.1)
Type of physical activity involved in	
Walking	137(64.6)
Exercise	17(8.0)
Yoga	26(12.3)
Sports	
Yes	43 (20.3)
No	169 (79.7)
Socially active	
Yes	145 (68.4)
No	67 (31.6)
Smoking habit	
Yes	33 (15.6)
No	179 (84.4)
Alcohol consumption	
Yes	8 (3.8)
No	141 (66.8)
Occasional	63 (29.7)
Tension	
Yes	116 (54.7)
No	96 (45.3)

Table 3: Out of pocket health expenditure during last recent visit

	Male	Female	Total pop	Total expenditure (NRs)	Average expenditure per population (NRs)
OPD services taken (within a month)	68	96	164	634250	3867
i. Doctor fees				73400	
ii. Medicines				436350	
iii. Lab diagnosis				68300	
iv. Others				56200	
Hospitalized (within a year)	21	13	34	2360100	69415
i. Admission fees				429500	
ii. Medicine cost				1147500	
iii. Bed charge				485100	
iv. operation fees				298000	

Table 4: Association of morbidities and socio demographic variables				
Sociodemographic variable	**Morbidity**		**Total**	**p-value (chi-square)**
	Chronic	**Multimorbidity**		
Age				
60-69	56 (64.4%)	64 (51.2%)	120 (56.6%)	0.152
70-79	19 (21.8%)	40 (32%)	59 (27.8%)	
80+	12 (13.8%)	21 (16.8%)	33 (15.6%)	
Sex				
Male	35 (40.2%)	58 (46.4%)	93 (43.9%)	0.401
Female	52 (59.8%)	67 (53.6%)	119 (56.1%)	
Ethnicity				
Privileged	73 (83.9%)	111 (88.8%)	184 (86.8%)	0.203
Under privileged	14 (88.8%)	14 (11.2%)	28 (13.2%)	
Marital status				
Married	74 (85.1%)	111 (88.8%)	185 (87.3%)	0.218
Unmarried	2 (2.3%)	-	2 (0.9%)	
Without a partner	11.1 (12.6%)	14 (11.2%)	25 (11.8%)	
Education level				
Primary	19 (21.8%)	33 (26.4%)	52 (24.5%)	0.523
Secondary	6 (6.9%)	13 (10.4%)	19 (9.0%)	
Higher secondary	7 (8%)	7 (5.6%)	14 (6.6%)	
Graduate and above	1 (1.1%)	-	1 (0.5%)	
Illiterate	54 (62.1%)	72 (57.6%)	126 (59.4%)	
Living arrangements				
Living alone	14 (16.1%)	4 (3.2%)	18 (8.5%)	0.002*
Living with family	72 (82.8%)	121 (96.8%)	193 (91.0%)	
Living with others	1 (1.1%)	-	1 (0.5%)	
Source of income				
Business	24 (27.6%)	46 (36.8%)	70 (33.0%)	0.003*
Rent	17 (19.5%)	18 (14.4%)	35 (16.5%)	
Remittance	7 (8%)	3 (2.4%)	10 (4.7%)	
Agriculture	12 (13.8%)	3 (2.4%)	15 (7.1%)	
Pension	8 (9.2%)	21 (16.8%)	29 (13.7%)	
Others	19 (21.8%)	34 (27.2%)	53 (25%)	
Physical activity				
Yes	73 (83.9%)	107 (85.6%)	180 (84.9%)	0.735
No	14 (16.1%)	18 (14.4%)	32 (15.1%)	
Involved in sports				
Yes	13 (14.9%)	30 (24%)	43 (20.3%)	0.107
No	74 (85.1%)	95 (76%)	169 (79.7%)	
Socially active				
Yes	52 (59.8%)	93 (74.4%)	145 (68.4%)	0.024*
No	35 (40.2%)	32 (25.6%)	67 (31.6%)	
Smoking habit				
Yes	17 (19.5%)	16 (12.8%)	33 (15.6%)	0.183
No	70 (80.5%)	109 (87.2%)	179 (84.4%)	
Alcohol consumption				
Yes	4 (4.6%)	4 (3.2%)	8 (3.8%)	0.866
No	57 (65.5%)	84 (67.2%)	141 (66.5%)	
Occasional	26 (29.9%)	37 (29.6%)	63 (29.7%)	
Tension				
Yes	38 (43.7%)	78 (62.4%)	116 (54.7%)	0.007*
No	49 (56.3%)	47 (37.6%)	96 (45.3%)	

Table 5: Life satisfaction among elderly comparing with different demographic variables				
Variables	**N**	**mean±Sd**	**F (t-test)**	**p value**
Sex				
Male	93	21.8±23.0	11.9	**0.001**
Female	119	23.0±3.82		
Ethnicity				
Privileged	184	22.3±3.1	7.246	**0.008**
Under privileged	28	23.57±4.19		
Religion				
Hindu	172	22.64±3.48		
Buddhist	25	21.56±2.08	1.18*	0.308
Christian	15	22.26±3.41		
Education				
Primary	52	21.25±2.1		
Secondary	19	21.31±2.21	5.01*	**0.001**
Higher secondary	14	21.85±3.81		
Graduate and above	1	20.00±0		
Illiterate	126	23.26±3.7		
Marital Status				
Married	185	22.40±3.3		
Unmarried	2	24.00±1.41	0.54*	0.57
Without partner	25	23.00±3.4		
Living arrangement				
Living alone	18	24.83±4.65	5.01*	**0.007**
Living with family	193	22.26±3.13		
Living with others	1	23.00±0		
Source of income				
Business	70	22.08±2.50		
Rent	35	21.22±1.51		
Remittance	10	23.3±3.9	5.37*	**<0.001**
Agriculture	15	22.1±2.53		
Pension	29	24.30±4.56		
Others	53	22.49±3.35		
Appetite				
Yes	197	22.49±3.43	1.90	0.16
No	15	22.46±2.09		
Physically active				
Yes	180	22.27±3.07	7.07	**0.008**
No	32	23.68±4.46		
Involved in sports/games				
Yes	43	21.39±2.17	7.76	**0.006**
No	169	22.76±3.14		
Socially active				
Yes	145	22.02±2.69	14.89	**<0.001**
No	67	23.50±4.30		
Smoking				
Yes	33	21.72±2.7	1.33	0.24
No	179	22.63±3.4		
Alcohol				
Yes	8	23.62±2.19		
No	141	22.46±3.67	0.47	0.62
Occasional	63	22.41±2.64		
Tension				
Yes	116	22.93±3.90	10.14	**0.002**
No	96	21.95±2.44		

*Anova test applied

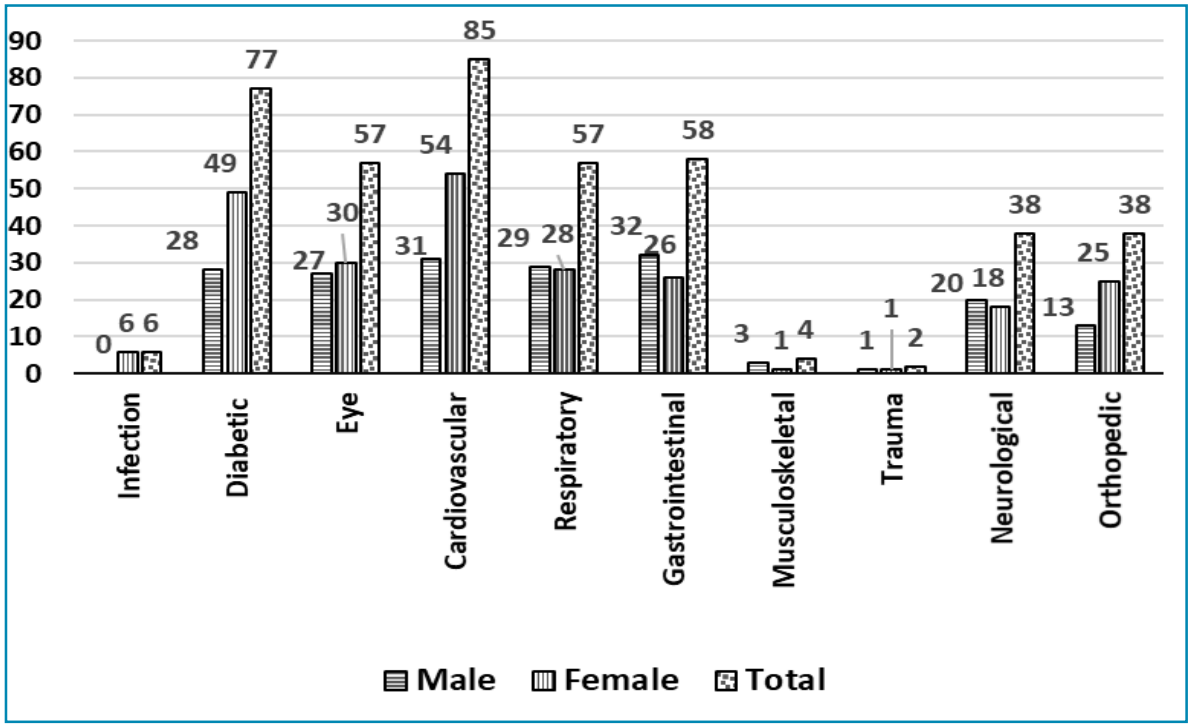

Fig. 1: Distribution of morbidity pattern among elderly

Life satisfaction (LS) among elderly was medium 90 (42.5%) and 89 (42.0%) had low satisfaction. Table 5 depicts LS among the elderly comparing with different demographic variables. Elderly females have a higher average life satisfaction compared to elderly males, and the difference is statistically significant (p =0.001). Similarly, there was a significant difference between ethnic group, different education level, with different living arrangement groups, those having different source of income, those involved in sports and those in tension (p <0.05).

DISCUSSION

Most common health system affected was cardiovascular 86 (40.6%). Other commonly affected health systems were endocrine76 (35.8%), digestive 59 (27.8%), respiratory system 57 (26.9%). This morbidity prevalence was different from the study done by Usha *et al*[13] and Dabade.[14] In these two studies done in different parts of India, musculoskeletal system was the most common morbidity among elderly.

In the present study chronic morbidity was more among those living with their families and financially independent elderlies. Similarly, socially active and those who had more tension had significantly more morbidities. This can be because of the reason that those elderlies living in families can have different food habits and could be sedentary compared to those living alone.[15] Socially active elderly spend more time in gossiping rather than being involved in physical activity.

In the study done by Usha *et al*[13] chronic morbidity was more among illiterate participants which was not significant and significantly more among unemployed and financially dependent elderlies. Dabade's study revealed that the age of participants increases the presence of morbidities.[14]

In the present study, out of 212 elderlies, 125 (59 %) had multi morbidity whereas 87 (41.0%) had chronic morbidity. The higher percentage having chronic morbidity was shown in previous study done by Usha *et al*.[13]

When considering out-of-pocket expenditure, the share of expenses on medication is significantly higher in both outpatient department (OPD) and hospitalized cases. It accounts for more than two-thirds and half of the total expenses in OPD and hospitalized cases, respectively.

In terms of medical expenses for the elderly population aged 65 years or above, government policies such as the old age allowance, also known as '*Briddha Bhatta*', provide Rs. 4,000 per month and health insurance coverage up to one lakh per year, with subsidies for individuals over 70 years old. A study done in Bhaktapur by Shrestha *et al*[16] revealed that opting for health insurance can reduce out-of-pocket expenses and provides crucial assistance

during emergency medical situations. Such health insurance policy appears justifiable as it aims to cover healthcare expenses for elderly individuals.

In the study done by Sujata *et al*[11] there is gender differential from the results as females are more likely to visit in OPD, whereas the reverse is the trend in hospitalized case which is quite similar to our findings.

The lifestyle of an individual further influenced life satisfaction. The study by Roopani[17] observed less satisfaction among alcohol and tobacco users, and more satisfaction among physically active individuals. In contrast, our study found that alcohol consumers reported higher life satisfaction, whereas physically active showed less life satisfaction. This difference may be due to a lower percentage of participants who were alcohol users in our study. Zapata-Lamana *et al*[18] in their study explored how various factors, including health and environmental quality, influence life satisfaction in physically active older adults. It highlights that despite being active, some elderly individuals may still experience low life satisfaction due to underlying health issues, social isolation, or other psychological factors.

In conclusion, elderly population bears a burden of morbidity, resulting in substantial healthcare expenses. Despite financial burden, life satisfaction levels vary among the elderly, influenced by gender, lifestyle choices. Female elderly individuals exhibit higher satisfaction, potentially due to robust social ties and proactive healthcare practices. Physical activity alone may not suffice for overall well-being without addressing other factors. Addressing gender-specific needs is crucial, considering the satisfaction gap between male and female elders. Promoting healthy lifestyles, improving healthcare access, and customized interventions are vital for enhancing elderly well-being. Further research is required to explore the intricate connections among health, expenditures, and life satisfaction among Nepal's elderly. Understanding these dynamics deeply is essential for crafting specific healthcare initiatives for the elderly in Nepal, highlighting the importance of providing holistic assistance for their welfare.

The geriatric population faces a burden of morbidity, with a notable prevalence of health conditions and illnesses. This burden of morbidity contributes to substantial out-of-pocket expenditures on healthcare services, particularly in relation to medicine costs. Despite the financial strain from healthcare costs, the old aged people display varying levels of life satisfaction.

Promoting healthy lifestyles, improving healthcare access, and customized interventions are vital for enhancing elderly well-being. Further research from various perspectives is needed to investigate the complex interconnections among health, expenses, and life satisfaction among Nepal's elderly. Understanding these dynamics deeply is essential for crafting specific healthcare initiatives for the elderly in Nepal.

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