

[ORIGINAL RESEARCH ARTICLE]


## Health Service Utilisation and Associated Factors among Older People in Kamalamai Municipality, Sindhuli District

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### Article History

Submitted 14 October 2025; Reviewed 15 November 2025; Accepted 29 December 2025

DOI: <https://doi.org/10.3126/ajps.v5i1.89341>

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### Published by

Department of Population Studies

Prithvi Narayan Campus

Tribhuvan University

Pokhara, Nepal



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### ABSTRACT

Population ageing is becoming a major concern in Nepal with the increasing prevalence of multiple chronic conditions. This study examines factors affecting health service utilisation among older people aged 60 years and above. A cross-sectional survey of 694 older people was conducted in Kamalamai Municipality, Sindhuli District. A structured digital questionnaire was applied to collect data. Data were analysed using descriptive statistics and a hierarchical multivariable logistic regression model. Sixty-four percent of older people had utilised health services in the past 12 months. This study demonstrates that health insurance, general health status, and morbidity conditions were significantly associated with health service utilisation. This study provides potential evidence for health policymakers to develop health strategies to improve health service utilisation among older people.

**Keywords:** health service utilisation, hierarchical logistic regression, Kamalamai municipality, older

people

## INTRODUCTION

With advancing age, older people become more vulnerable to ill-health with multiple chronic diseases (Barnett et al., 2012; Rechel et al., 2009). The higher prevalence of chronic diseases in older age means a higher demand for health services compared to other age groups (Faraji-Khiavi et al., 2022). Health service utilisation is important for improving health status, reducing morbidity and mortality, and preventing and treating health problems of older people. Carrasquillo (2013) and Fisher (2019) describe that health care utilisation refers to how older people use any health care services, medical procedures, prescribed medicine and consultations to prevent illness, cure diseases, and promote or regain good health.

Decisions to use health care services are shaped by various factors pertaining to older people's self-perceived health status and the availability of health care services to them (Fernández-Olano et al., 2006). Older people are at greater risk of multiple chronic diseases and functional limitations; they usually need more health care services. Ensuring access to appropriate health services is an important issue, which helps older people maintain their health status and improve their health-related quality of life.

Previous research in South Africa (Abera Abaerei et al., 2017) and India (Chatterjee et al., 2019) showed that the use of health services among older people was associated with demographic, social, economic, and environmental factors, as well as the burden of chronic diseases. Earlier studies in this respect in Nepal have examined the association between the socio-demographic variables and health service utilisation (Acharya et al., 2019; Khatiwada, 2024), and the association between predisposing, enabling, and need factors, and health service utilisation among older people (Chhetri et al., 2023; Ghimire et al., 2021; Karmacharya et al., 2021).

Previous studies in Nepal have partially explored the factors that influence health service utilisation among older people living in semi-urban settings, leaving important influences still underexamined. This study focused on filling the gaps left by earlier studies in Nepal, applying Andersen's Health Behavioural Model (Andersen, 1995). According to this model, it assumes that predisposing, enabling, need, and health-related behavioural factors determine health service utilisation among older people.

## DATA AND METHODS

### Data source

The data for this study were collected from a cross-sectional household survey conducted from the last week of January to the first week of March 2023 among the older people residing in Kamalamai Municipality, Sindhuli district.

### Study setting

Kamalamai Municipality is one of the two urban municipalities of Sindhuli district with 14 wards, located from the Chure range in the south to the Mahabharat in the north, covering 482.57 square kilometers. It is the most populous municipality with a total population of 70,207 (National Statistics Office, 2023). The population density of Kamalamai Municipality is 147 persons per square kilometre. The population growth rate is 0.94 percent, higher than that of the district and other municipalities.

### Study population and sample size

The study population was older people aged 60 years and above who were residents of the Kamalamai Municipality, Sindhuli district. The sample size of the study was calculated using OpenEpi (Dean et al., 2013), with the following parameters: the proportion of health service utilisation by older people was 62 percent (Ghimire et al.,

2021), 95 percent confidence interval, 5 percent margin of error, and design effect of 2. Based on the total older population aged 60 years and above ( $N=7,646$ ) in Kamalamai Municipality, the final sample size ( $n$ ) was 692.

#### *Sampling techniques*

This study followed a multi-stage sampling design. In the first stage, Kamalamai Municipality was selected purposively as the study site due to its diverse socioeconomic status and semi-urban area. In the second stage, all wards of the Kamalamai Municipality were selected as primary sampling units (PSUs). The sample size for each ward was determined based on the probability proportional to the number of older people aged 60 years and over in that ward. In the third stage, a list of households with older people aged 60 years and above was prepared using the District Election Office's voter roll, and an updated household list was prepared after consulting community leaders and residents once we reached the ward's central catchment area. In the fourth stage, the required number of households/eligible individuals was selected from the list of households by simple random sampling techniques using 'Decision Analyst STATS 2.0' software. From a sample household, only one eligible person was interviewed.

#### **Data collection and statistical analysis**

Data were collected through face-to-face interviews with eligible individuals using a structured digital questionnaire. Initially, digital questionnaires were prepared in Kobo Collect/Toolbox in English and then translated into Nepali and set up in Kobo Toolbox. Hence, digital questionnaires in Nepali on the Kobo Toolbox were used to collect data via individual interviews.

Crosstabulations are performed to examine the association between predisposing, enabling, need, and health-related behavioural factors and health service utilisation. Variables with a  $p$ -value less than 0.25 in the bivariate analysis (i.e. chi-square analysis) were included in the multivariable logistic regression model (Hosmer & Lemeshow, 2000) to avoid excluding potentially important predictor variables. Four hierarchical logistic regression models were conducted. In the initial step of the hierarchical logistic regression, Model 1 included four predisposing factors. Model 2 consisted of significant variables from Model 1 and three enabling factors. Model 3 included significant variables from Model 2 and four needs factors, and Model 4 consists of significant variables from Model 3 and four health-related behavioural factors.

#### **Study variables**

##### ***Dependent Variable***

The dependent variable is binary, coded as 1 for older people who have visited a health facility or consulted a doctor or other health care provider, and 0 for older people who have not. This variable was assessed by asking older people two questions: (1) In the past 12 months, have you visited any health care facility, or has any health worker visited you? (2) Have you consulted a doctor or other health care provider in the past 12 months? The outcome variable, Health service utilisation in this study, refers to an older person's visit to any health facility for treatment or to consult with a doctor or health care provider about their health problem or illness.

##### ***Independent Variables***

The predisposing factors include eight variables: age, sex, education, marital status, living arrangement, family type, and caste/ethnicity. Age is classified as 60-69 years, 70-79 years, and 80 years and above. Education is categorised as no education, literate but no formal education, basic education, and secondary and higher education. Marital status is classified as married, widowed/divorced, or separated. The living

arrangement is categorised as living alone, living with spouse only, living with son/daughter-in-law, or living with others. Family types are classified as nuclear and joint families. Caste/ethnicity is categorised into three groups: Hill Caste, Hill Janajati, and Hill Dalit.

The enabling factors include working status, economic dependency, social security allowance, health insurance, and wealth quintile. Working status is divided into two categories: currently working and not working. Economic dependency is divided into three categories: not dependent, partially dependent, and entirely dependent. The variables social security allowance and health insurance coverage are classified as yes and no categories.

Need factors include general health status, ADL, IADL, disability, and morbidity. General health status is categorised as good, fair, and poor. Disability is classified as none, mild, moderate, and severe disability. Morbidity condition is classified as no morbidity, one morbidity, and multimorbidity.

Health-related behavioural factors consisted of smoking, tobacco use, alcohol consumption, and physical activities. Smoking, tobacco use, and alcohol use are classified into two groups: never smoker/tobacco user/alcohol user and current/former smoker/tobacco user/alcohol user. Physical activities are divided into yes and no categories.

## **RESULTS**

### **Health service utilisation**

A total of 694 older people aged 60 years and above, with males accounting for 54.3 percent and females for 45.7 percent. The mean age of older people was 71.7 years with a standard deviation of 8.4 years. Sixty-four percent of older people had utilised health services in the last 12 months. Chi-square analysis showed that health service utilisation did not differ significantly by age group, sex, marital status, living arrangement, caste/ethnicity, or education level. Among the enabling factors, health insurance and wealth quintile were significantly associated with health service utilisation, indicating that health service utilisation among older people differed significantly by health insurance and wealth quintile. Likewise, among the needs factors, general health status and multimorbidity were significantly associated with health service utilisation among older people. Furthermore, the results indicated that among the health-related behavioural factors, smoking, tobacco use, and alcohol consumption were significantly associated with health service utilisation among older people.

**Table 1***Health Service Utilisation among Older People*

	Population		Health service utilisation		
	N	%	Yes	No	$\chi^2$ p-value
			%	%	
<b>Predisposing factors</b>					
Age group					
60-69	301	43.4	60.5	39.5	<b>0.207</b>
70-79	269	38.8	66.9	33.1	
80+	124	17.9	66.1	33.9	
Mean age $\pm$ SD	71.7 $\pm$ 8.4		71.9 $\pm$ 8.4	71.3 $\pm$ 8.4	
Sex					
Male	377	54.3	63.1	36.9	0.959
Female	317	45.7	65	35	
Marital status					
Married	392	56.5	65.6	34.4	0.300
Widowhood/Separated/Divorced	302	43.5	61.9	38.1	
Type of family					
Nuclear family	228	32.9	63.2	36.8	0.742
Joint family	466	67.1	64.4	35.6	
Living arrangement					
Living alone	66	9.5	59.1	40.9	<b>0.182</b>
Living spouse only	131	18.9	68.7	31.3	
Living with son/daughter-in-law	428	61.7	64.7	35.3	
Living with others	69	9.9	55.1	44.9	
Caste & ethnicity					
Hill caste	306	44.1	68	32	<b>0.098</b>
Hill Janajati	227	32.7	59.5	40.5	
Hill Dalit	161	23.2	62.7	37.3	
Education level					
No education	489	70.5	62.8	37.2	<b>0.196</b>
Literate but no education	71	10.2	74.6	25.4	
Basic education	90	13	64.4	35.6	
Secondary and above	44	6.3	59.1	40.9	
<b>Enabling factors</b>					
Working status					
Currently working	296	42.7	66.9	33.1	<b>0.149</b>
Not working	398	57.3	61.8	38.2	
State of economic dependence					
Not dependent	198	28.5	64.6	35.4	0.860
Partial dependent	413	59.5	64.2	35.8	
Full dependent	83	12.0	61.4	38.6	
Received any allowance					
Yes	477	68.7	64.4	35.6	0.744
No	217	31.3	63.1	36.9	
Health insurance covered					

# Health Service Utilisation and Associated Factors among Older People in Kamalamai Municipality, Sindhuli

	Population		Health service utilisation		
	N	%	Yes	No	$\chi^2$ p-value
			%	%	
Yes	369	53.2	71.8	28.2	<b>0.000</b>
No	325	46.8	55.1	44.9	
Wealth quintile					
Poorest	140	20.2	55	45	<b>0.033</b>
Poorer	138	19.9	67.4	32.6	
Middle	140	20.2	64.3	35.7	
Richer	138	19.9	61.6	38.4	
Richest	138	19.9	71.7	28.3	
<b>Need factors</b>					
General health status					
Good	227	32.7	49.8	50.2	<b>0.000</b>
Fair	360	51.9	68.9	31.1	
Poor	107	15.4	77.6	22.4	
Activities of daily living					
Independent	345	49.7	66.1	33.9	<b>0.228</b>
Dependent	349	50.3	61.9	38.1	
Instrumental activities of daily living					
High functioning	431	62.1	63.3	36.7	0.640
Low functioning	263	37.9	65	35	
Disability					
None	209	30.1	61.2	38.8	<b>0.172</b>
Mild	374	53.9	66.3	33.7	
Moderate	93	13.4	64.5	35.5	
Severe	18	2.6	44.4	55.6	
Multimorbidity					
No morbidity	114	16.4	40.4	59.6	<b>0.000</b>
One morbidity	236	34.0	66.1	33.9	
Multimorbidity	344	49.6	70.3	29.7	
<b>Health-related behavioural factors</b>					
Smoking					
Never smoker	358	51.6	68.2	31.8	<b>0.013</b>
Current/ex-smoker	336	48.4	59.5	40.5	
Tobacco use					
Never use	485	69.9	66.8	33.2	<b>0.013</b>
Current/Ex-user	209	30.1	57.4	42.6	
Alcohol consumption					
Never user	403	58.1	67.5	32.5	<b>0.018</b>
Current/ex-user	291	41.9	59.1	40.9	
Physical activities					
No	101	14.6	70.3	29.7	<b>0.134</b>
Yes	593	85.4	62.9	37.1	
Total	694	100.0	64.0	36.0	

### Factors associated with health service utilisation

The hierarchical multiple logistic regression was conducted to comprehensively identify factors influencing the health service utilisation among older people. Model 1 included predisposing factors with a p-value <0.25 in bivariate analysis (Table 2), and results showed that caste and ethnicity were significantly associated with health service utilisation. Compared with Hill Caste, older people from Hill Janajati were 33 percent less likely to use health services (OR=0.67, 95% CI=0.46-0.96,  $p<0.05$ ), and those from Hill Dalit were 18 percent less likely to use health services. Model 2 showed that health insurance and household wealth quintiles were significantly associated with health service utilisation. Older people with health insurance were 99 percent more likely to use health services than older people without health insurance (OR=1.99, 95% CI=1.46-2.71,  $p<0.001$ ). Similarly, compared with older people who belonged to the poorest households, those who belonged to poorer households (OR =1.63\*, 95% CI=1.01-2.63,  $p<0.05$ ) and richest households (OR=1.93, 95% CI=1.17-3.20,  $p<0.05$ ) were more likely to utilise health services. Model 3 revealed that health insurance, wealth quintiles, health status, and morbidity were significantly associated with health service utilisation. The odds of health insurance and the odds of the poorest and richest wealth quintiles decreased slightly after adjusting for need factors in the model. The study found that older people with health insurance were more likely to use health services (OR=1.72, 95% CI=1.25-2.37,  $p<0.001$ ) than older people without health insurance. Similarly, compared with older people in the poorest wealth quintile, those in the richest wealth quintile were more likely to use health services (OR=1.71, 95% CI=1.02-2.89,  $p<0.05$ ).

**Table 2**

*Hierarchical Multiple Logistic Regression Analysis of Predisposing, Enabling, Needs, and Health-Related Behavioural Factors Affecting Health Service Utilisation among Older People*

	Model 1		Model 2		Model 3		Model 4	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
<b>Predisposing factors</b>								
Age group								
60-69								
70-79	1.34	[0.96, 1.88]						
80+	1.28	[0.82, 1.99]						
Living arrangement								
Alone								
Living spouse only	1.62	[0.89, 2.94]						
Living with son/daughter-in-law	1.32	[0.79, 2.20]						
Living with others	0.92	[0.48, 1.75]						
Caste & ethnicity								
Hill Caste								
Hill Janajati	0.67*	[0.46, 0.96]	0.74	[0.52, 1.06]				
Hill Dalit	0.82	[0.55, 1.23]	0.94	[0.63, 1.42]				
Education level								
Illiterate								
Literate but no education	1.72	[0.99, 3.00]						
Basic education	1.03	[0.64, 1.66]						
Secondary and above	0.71	[0.38, 1.35]						

## Health Service Utilisation and Associated Factors among Older People in Kamalamai Municipality, Sindhuli

	Model 1		Model 2		Model 3		Model 4	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
<b>Enabling factors</b>								
Working status								
Currently working								
Not working			0.75	[0.55, 1.03]				
Health insurance								
No								
Yes			1.99***	[1.46, 2.71]	1.72***	[1.25, 2.37]	1.82***	[1.32, 2.51]
Wealth quintile								
Poorest								
Poorer			1.63*	[1.01, 2.63]	1.47	[0.89, 2.42]	1.47	[0.89, 2.44]
Middle			1.38	[0.86, 2.22]	1.36	[0.83, 2.25]	1.39	[0.84, 2.31]
Richer			1.20	[0.74, 1.93]	1.10	[0.67, 1.79]	1.16	[0.71, 1.91]
Richest			1.93*	[1.17, 3.20]	1.71*	[1.02, 2.89]	1.72*	[1.01, 2.93]
<b>Needs factors</b>								
General health status								
Good								
Fair					1.90***	[1.33, 2.72]	1.93***	[1.36, 2.75]
Poor					3.56***	[1.99, 6.37]	2.85***	[1.60, 5.05]
Activity of daily living								
Independent								
Dependent					0.71	[0.50, 1.02]		
Disability								
None								
Mild					0.96	[0.66, 1.41]		
Moderate					0.68	[0.38, 1.21]		
Severe					0.35	[0.12, 1.01]		
Morbidity								
No morbidity								
One morbidity					2.50***	[1.56, 4.01]	2.46***	[1.54, 3.92]
Multimorbidity					3.05***	[1.88, 4.93]	2.46***	[1.55, 3.91]
<b>Health-related behavioural factors</b>								
Smoking								
Never smoker								
Current/ex-smoker							0.84	[0.58, 1.20]
Tobacco use								
Never user								
Current/Ex-user							0.79	[0.54, 1.15]
Alcohol use								
Never user								
Current/ex-user							0.90	[0.62, 1.30]
Physical activity								
No								
Yes							1.15	[0.69, 1.90]
Constant	1.38	[0.81, 2.34]	1.20	[0.74, 1.94]	0.35***	[0.20, 0.62]	0.32**	[0.15, 0.69]

\*\*\* p < .001, \*\* p < .01, \* p < .05

Model 4 showed that health insurance, wealth quintile (richest), health status, and morbidity continue to have statistically significant and independent effects on the likelihood that older people use health services. Older people with health insurance (OR=1.82, 95%CI=1.32-2.51,  $p<0.001$ ), who belonged to the richest wealth quintile (OR=1.72, 95%CI=1.01-2.93,  $p<0.05$ ), were associated with a higher likelihood of utilising health services compared to older people who had no health insurance and who belonged to the poorest wealth quintile, respectively. Older people with fair health status (OR=1.93, 95%CI=1.36-2.75,  $p<0.001$ ) and poor health status (OR=2.85, 95%CI=1.60-5.0,  $p<0.001$ ) were more likely to utilise health services compared to older people with good health status. Similarly, older people with one morbidity (OR=2.46, 95%CI=1.54-3.92,  $p<0.001$ ) and multimorbidity (OR=2.46, 95%CI=1.55-3.91,  $p<0.001$ ) were more likely to use health services than older people with no morbidity. However, the odds of health service utilisation among older people with one morbidity and multimorbidity decreased slightly in the final model compared to Model 3.

## DISCUSSION

This study primarily aimed to determine which predisposing, enabling, needs, and health-related behavioural factors are associated with health service utilisation among older people. In this study, the level of health service utilisation among older people in the past 12 months is 64 percent, which is lower than previous studies conducted in the Dhulikhel municipality (Sanjel et al., 2012), Pokhara metropolitan city (Acharya et al., 2019; Karmacharya et al., 2021), Kushma municipality (Chhetri et al., 2023), and slightly higher than Sudurpaschim province of Nepal (Ghimire et al., 2021). This study found that older people from Hill Janajati were less likely to utilise health services compared to those from Hill Caste. Earlier studies conducted in Sudurpaschim province of Nepal by Ghimire et al. (2021) showed that older people belonging to Janajati were less likely to utilise health services compared to the upper-caste. A study conducted by Acharya et al. (2019) suggested that older people belonging to a privileged group were less likely to utilise health services than those belonging to underprivileged groups. However, after controlling for enabling factors such as working status, health insurance, and wealth quintile, this study found no significant association between Hill Janajati and health service utilisation.

Health insurance and the richest wealth quintile were significant positive predictors of health service utilisation among older people. This finding is consistent with studies from India (Rahaman et al., 2022) and Ghana (Awoke et al., 2017) but not with studies conducted in different settings in Nepal (Acharya et al., 2019; Karmacharya et al., 2021). It suggested that older people in the richest wealth quintile have better financial capacity and can pay the costs needed to access health services, which could be a plausible reason for the higher likelihood of utilising health services.

As observed previously in Nepal (Karmacharya et al., 2021), Ethiopia (Amente & Kebede, 2016), India (Rahaman et al., 2022) and China (Zeng et al., 2021), older people with poor health status were more likely to utilise health services. The possible explanation for this result may be attributed to the fact that older people with poor health status are more likely to suffer from chronic diseases and require frequent visits to health facilities.

Older people living with one or more morbidities were more likely to use health services compared to those living without morbidity. This finding aligns with the results from earlier studies conducted in Nepal (Acharya et al., 2019; Chhetri et al., 2023; Ghimire et al., 2021; Poudel et al., 2022), Thailand (Thanakiattiwibun et al., 2023), and

India (Puri & Pati, 2022). It indicates that older people were more likely to suffer from multiple chronic diseases, need more primary health care services, and have more frequent visits to health facilities (Zeng et al., 2021), which could be a plausible cause of a higher likelihood of using health services.

## CONCLUSION

The present study indicates that health insurance, general health status, and morbidity conditions had a greater influence on the utilisation of health services among older people. It highlights the need to be given to health insurance or medical insurance, since it can make healthcare services more affordable and accessible for older people. Beyond health insurance, health strategies for older people should focus on preventing and managing chronic diseases, and supporting their well-being and healthy ageing.

## DECLARATIONS

**Authors' contributions:** NRT conceptualized and designed the study, collected and analyzed the data, prepared the manuscript, and revised the manuscript.

GS co-conceptualized the study, supervised the research, and critically reviewed.

VKKC co-conceptualized the study, co-supervised the research, and validated statistical analysis.

**Data availability statement:** The datasets used in this study are not publicly available due to data confidentiality.

**Ethical approval:** All participants provided informed consent prior to data collection.

Oral ethical approval was obtained from the local community.

**Competing interests:** The authors have no competing interests.

**Funding declarations:** No funding was available for this research.

**Declaration on AI use:** AI tools were used only for language editing.

## Acknowledgements

We extend our sincere gratitude to the older people residing in Kamalamai Municipality, Sindhuli district, for their valuable time in participating in this study, which made this study possible.

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