



Review Article

# Assessing Earthquake Induced Vulnerability and Impact on Elderly Populations in Nepal

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## ABSTRACT:

**Background:** A disaster is a harmful situation that affects various aspects of human health. Elderly individuals face numerous challenges during and after a disaster, including health, socio-economic, and demographic issues. Due to their physical frailty and weakened immune systems, the elderly are particularly vulnerable during disasters. This study aims to assess the situation of the elderly population following an earthquake disaster.

**Methods:** The study was conducted in Thanapati VDC of Nuwakot district, encompassing all nine wards. The study population consisted of individuals aged 60 years and above in Thanapati VDC, with 50 percent (194 individuals) of the total elderly population selected as the sample population. The study employed both quantitative and qualitative methods.

**Result:** The proportion of elderly individuals in the study area was higher than the national average due to youth migration to urban areas and foreign countries for employment. Following the earthquake disaster, over 70 percent of the elderly population (77.8% physical health, 72.7% mental health) experienced physical and mental health issues. Only a small proportion (30.1%) sought medical attention and treatment for their health problems, indicating poor healthcare practices in the area. Additionally, more than 90% of the elderly population in the study area lived in temporary shelters after the disaster, facing various challenges in these temporary accommodations.

**KEYWORDS:** Earthquake, Natural Calamity, Vulnerability, Elderly, Rehabilitation, Nepal.

## INTRODUCTION

Population ageing is the result of demographic transition, where populations shift from high fertility and mortality rates to lower levels. This shift has led to significant changes in the age structure of populations worldwide, with a notable increase in the proportion and number of elderly individuals. The trend of population ageing began in the 1950s and has since accelerated, with the population aged 60 and over growing at a faster rate than the total population in most regions. In 1950, there were 205 million individuals aged 60 or over globally, and by 2012, this number had risen to nearly 810 million. Projections indicate that this number will more than double by 2050, reaching 2 billion (Help Age International, 2012).

Increase the socio-economic status of people and life expectancy at birth are greater achievement in human life. Where the life expectancy is increase there is the proportion of elderly people also increases. The elderly populations are increase all over the world due to the

technological innovation on health sector; increase the knowledge of people and socio-economic development. In the context of Nepal, the elderly people aged 60 years and above are 8.13 percent of the total population in 2011 which was increased from 7.46 percent in 2001, 5.88 percent in 1971 and 4.28 percent in 1911. The life expectancy is also increasing trend which is 66 years in 2011, 58 years in 2001, 41.96 years in 1971 and 19.18 years in 1911 (CBS, 2001 and 2011). With the improvement in living standards, an educational status and health facility, the life expectancy of the Nepalese population has been increasing. The ageing index, which indicates the number of old people compared to children, has been consistently increasing over decades. The index has increased from 7.78 in 1971 to 15.50 in 2011 (CBS, 2001 and 2011).

Nepal is the 11th most earthquake-prone country in the world (NPC, 2015). Ever since the first recorded earthquake of 1255 AD that killed one-third of the population of the Kathmandu Valley and its King, Abhaya Malla, Nepal has experienced a major earthquake every few generations. The last great earthquake (of magnitude 8.4) in 1934 AD resulted in more than 10,000 deaths in the Kathmandu Valley. On Saturday, 25 April 2015 at 11:56 local time, a 7.6 magnitude earthquake as recorded by Nepal's National Seismological Centre (NSC), struck Barpak in the historic district of Gorkha, about 76 km northwest of Kathmandu. Nepal had not faced a natural shock of comparable magnitude for over 80 years. The 8702 peoples were died from Nepal Earthquake 2015, among of them 3899 were male and 4801 were female and 22303 peoples were injured from the natural disaster (NPC, 2015).

In the context of Nepal elderly population increasing day by day, but the social security system is not satisfactory due to the lower level of development. The elderly people face many problems in every sector such as family, household, community, and national level. During post disaster period elderly peoples are more vulnerable than other people due to the physical and mental weakness and disabilities. They were also faced many health-related problems during and after disaster period due to the loss of the health institution, lack of knowledge, harmful social and cultural practices, lack of transportation and so on. They also affected by the long-term health effects due to the lack of health services in disaster period. The family system sifting from joint to nuclear family the elderly people are flee to live lonely. Many of the older people have no family support for enhance the quality of life.

In the context, the study area (Thanapati VDC) is one of the most affected by the Nepal Earthquake 2015. This study will be helpful to understand the elderly peoples, their needs, problems and real situation of elderly peoples of the study area.

## **MATERIALS AND METHODS**

### *Research Design & Study Population*

In this study descriptive and exploratory research design has been applied to analyze the collected information. Descriptive research design has been used to describe the collected information or data and exploratory research design have been used to find out the actual situation of elderly people.

Thanapati VDC was purposively selected the study area. All the wards (9 wards) were included in the study. Population above 60 years living in the Thanapati VDC has been selected as the sample population.

### *Sample Size*

According to district profile of Nuwakot, the population of Thanapati VDC was 2835 in 2011. Among the total population 377 (13.3%) was elderly population, who reached 60 years and above. The proportion of ageing population of Thanapati VDC is more than the national average (8.13%).

The sample size for this study has been determined at 194 elderly people, which is the fifty percent of the total ageing population of Thanapati VDC. About 50 percent of the elderly population residing in the study area has been selected the sample population.

#### *Data Collection & Analysis*

In this study structured questionnaire were used for data collection. The questionnaire includes the household schedule and individual questionnaire. Focus Group Discussion was also conducted to support the qualitative results. In the study area three focus group discussions were conducted. Checklist is used to conduct the focus group discussion (FGD) and in-depth study of the ageing population. Checklist for FGD includes the various subjects such as: perception and experience of elderly people during disaster period, condition of elderly people in disaster period, problems faced by old aged population, and working status of different agencies.

In this study both quantitative and qualitative methods have been used to analysis of the collected data. The quantitative data has been processed by using the SPSS software of computer. After the data entry in SPSS software all variables were checked by the frequency table and clean up the data. After processing the data analyzed with the help of frequency table cross-tabulation and custom tables by univariate, bi-variate and multi-variate tables. The qualitative information which was written at the time of focus group discussion was translate and analyzed descriptively.

#### *Socio-Demographic characteristics of study populations*

Among of the total respondents 57.2 % were male and 42.8 % were female. Likewise, the population of young old aged 60 – 69 years were 42.8 %, old aged 70 -79 years were 36.1 % and old old aged were 80+ years were 21.1 %. In the study area the higher proportion of respondents were Brahman/Chhetri 56.2 % and lower proportion of respondents were Dalits 6.7 % only.

**Table 1: Socio-Demographic characteristics of study populations**

Variables	Number	Percent
<b>Gender</b>		
Male	111	57.2
Female	83	42.8
<b>Age-Group (in Years)</b>		
60-69	83	42.8
70-79	70	36.1
80+	41	21.1
<b>Caste / Ethnicity</b>		
Brahman/Chhetri	109	56.2

Newar / Gurung	18	9.3
Tamang	54	27.8
Dalits	13	6.7
<b>Religion</b>		
Hindu	139	71.6
Bouddha	54	27.8
Cristian	1	0.5
<b>Literacy Status</b>		
Literate	51	26.3
Illiterate	143	73.7
<b>Marital Status</b>		
Married	113	58.2
Unmarried	2	1.0
Widow/widower	77	39.7
Separated	2	1.0
<b>Occupation on their economically active age</b>		
Agriculture	177	91.2
Non-Agriculture	17	8.8
<b>Management of money for daily work</b>		
Self-management	109	56.2
Depends on husband or wife	9	4.6
Depends on son or daughter in law	71	36.6
Depends on daughter or son in law	1	0.5
Depends on grandson or granddaughter	4	2.1

[Source: Field Study 2016]

Among of the total respondents' higher proportions of them 71.6 % were followed Hindu religion, 27.8 % were followed Bouddha religion and only 0.8 % of them were followed Cristian religion. Among of the total respondents 73.7% were illiterate, 58.2 % were currently married, 39.7 % were widow/widower, and 91.2 % of respondents were involved in agriculture on their economically active age. Similarly, Higher proportion of old aged populations were self-managed economic source for their daily work and very lower proportion only 0.5 % were depends on their daughter or son-in-law.

#### *Health Situation of Study Populations*

Health is a most important factor for the quality of life. Health situation of the men / women determines the other related factor to achieve the quality of life, such as education, income, life expectancy and so on. Health of the old aged population is most important for their further life. The current health condition of senior citizens refers to very good, good, normal and bad. Its information is obtained in scaling order, i.e. very good means the interviewed respondents him/herself have not any physical problems in current time and they did not face the any kinds

of physical health problems from some years. Likewise, good means the interviewed respondents faced the various health problems in past time but they have not any health problems in present time. Similarly, normal health condition refers the old aged people face the general sickness but they are not face the complicated health problems and bad health condition refers the respondents are facing the different kind of health problems.

**Table 2: Current health condition of old aged population**

Variables	Current Health Condition				Total (n)
	% Very Good	% Good	% Normal	% Bad	
<b>Gender</b>					
Male	0.9	22.5	65.8	10.8	111
Female	0.0	10.8	67.5	21.7	83
<b>Age Group</b>					
60-69	1.2	26.5	65.1	7.2	83
70-79	0.0	12.9	71.4	15.7	70
80+	0.0	7.3	61.0	31.7	41
<b>Caste / Ethnicity</b>					
Brahman / Chhetri	0.0	21.1	61.5	17.4	109
Newar / Gurung	0.0	27.8	66.7	5.6	18
Tamang	1.9	7.4	79.6	11.1	54
Dalits	0.0	15.4	53.8	30.8	13
<b>Literacy Status</b>					
Literate	0.0	25.5	68.6	5.9	51
Illiterate	0.7	14.7	65.7	18.9	143
<b>Total</b>	<b>0.5</b>	<b>17.5</b>	<b>66.5</b>	<b>15.5</b>	<b>194</b>

[Source: Field Study 2016]

In the study area, the higher proportion of old aged population reported that their health condition is normal and very few people said that their health condition is very good. Among of the total elderly population 66.5 percent said that their health is normal, 17.5 percent said their health is good, 15.5 percent said that their health is bad and only 0.5 percent respondent said that their health is very good. The female populations who have bad health condition were higher than male population. Higher proportions of people aged 80 years and above have bad health condition than other age groups. Similarly, higher proportions of Newar/Gurung population have good health condition and higher proportions of Dalits people have bad health condition than other caste/ethnic groups. And more illiterate people have bad health condition than literate population.

#### A. Physical Health Problems among Respondents

Physical health problems refer the problems appeared in any parts of body such as stomach pain, respiratory / asthma, blood pressure, gastritis, sugar, uric acid and so on. In any society,

all people have not physical problems, some people have physical problems and some people have not. The physical health problems are different in different situation and ages. All people are not faced the similar physical health problems, they also faced the different physical health problems due to their age, gender, their occupation, food habits and so on.

**Table 3: Physical health problems and its types**

Variables	% Having physical problems	Total (n)	% Stomach pain	% Respiratory/Asthma	% Blood pressure	% Sugar/ diabetics	% Gastritis	% Uric acid / joint pain	% Heart disease	% Kidney / urine related problems	Having physical problems		Total (n)
											% Before earthquake	% After earthquake	
<b>Gender</b>													
Male	69.4	111	13	33.8	10.4	3.9	7.8	27.3	7.8	13	37.7	62.3	77
Female	89.2	83	43.2	12.2	4.1	2.7	4.1	52.7	1.4	8.1	24.3	75.7	74
<b>Age Group</b>													
60-69	67.5	83	26.8	19.6	8.9	1.8	5.4	39.3	5.4	8.9	19.6	80.4	56
70-79	82.9	70	24.1	22.4	10.3	3.4	8.6	31	5.2	12.1	29.3	70.7	58
80+	90.2	41	35.1	29.7	0	5.4	2.7	54.1	2.7	10.8	51.4	48.6	37
<b>Caste / Ethnicity</b>													
Brahman/ Chhetri	78.9	33	23.2	18.6	9.3	5.8	4.6	38.4	5.8	10.5	34.9	65.1	24
Newar / Gurung	77.8	18	21.4	21.4	0	0	28.6	28.6	0	28.6	14.3	85.7	14
Tamang	74.1	54	40	35	2.5	0	2.5	45	5	2.5	32.5	67.5	40
Dalits	84.6	13	27.3	18.2	18.2	0	0	45.5	0	18.2	18.2	81.8	11
<b>Literacy Status</b>													
Literate	72.5	51	8.1	21.6	5.4	10.8	13.5	32.4	8.1	8.1	45.9	54.1	37
Illiterate	79.7	143	34.2	23.7	7.9	0.9	3.5	42.1	3.5	11.4	26.3	73.7	114
<b>Total</b>	<b>77.8</b>	<b>194</b>	<b>27.8</b>	<b>23.2</b>	<b>7.3</b>	<b>3.3</b>	<b>6</b>	<b>39.7</b>	<b>4.6</b>	<b>10.6</b>	<b>31.1</b>	<b>68.9</b>	<b>151</b>

[Source: Field Study 2016]

Among of the total old aged populations 77.8 percent have physical health problems and only 22.2 percent have not physical health problems. The old aged populations who have physical health problems, 27.8 percent have stomach pain, 23.2 percent have respiratory or asthma, 7.3 percent have blood pressure, 3.3 percent have sugar or diabetes, 6.0 percent have gastritis, 39.7 percent have uric acid or joint pain, 4.6 percent have heart disease and 10.6 percent have kidney or urine related problems. Among of them 68.9 percent faced the problems after the earthquake and only 31.1 percent population have faced the problems before the earthquake.

About 90 percent of the female reported about their physical problem significantly which was higher than male percent having physical health problems. The higher proportions of people aged 80 years and above having physical health problems is 90.2 percent which was higher than other age groups. Similarly, many Dalits people have physical problems was 84.6 percent which was higher than other caste/ethnic groups and more illiterate people have physical problems than literate populations.

#### B. Mental Health Problems among Respondents

In this study mental health refers the health condition related with mind and thinking. In this study mental health problem means feeling insecurity, feeling boredom or stress, feeling loneliness and feeling neglect or depression. Many people remember that health problems mean only physical health problems but physical problems not only health problems, mental problems also health problems. This study conducted in rural area of Nepal, so many respondents is not aware about mental health problems.

**Table 4: Mental health problems and its types**

Variables	Having Mental Problems			If Yes Types of Mental Problems				
	% Yes	% No	Total (n)	% Feeling Insecurity	% Boredom /Stress	% Loneliness	% Neglect or depression	Total (n)
<b>Gender</b>								
Male	71.2	28.8	111	27.8	38.0	31.6	2.5	79
Female	74.7	25.3	83	22.6	38.7	29.0	9.7	62
<b>Age Group</b>								
60-69	74.7	25.3	83	24.2	38.7	33.9	3.2	62
70-79	65.7	34.3	70	21.7	41.3	30.4	6.5	46
80+	80.5	19.5	41	33.3	33.3	24.2	9.1	33
<b>Caste / Ethnicity</b>								
Brahman/Chhetri	64.2	35.8	109	22.9	38.6	30.0	8.6	70
Newar/Gurung	88.9	11.1	18	37.5	31.3	25	6.3	16
Tamang	79.6	20.4	54	30.2	39.5	30.2	0	43
Dalits	92.3	7.7	13	8.3	41.7	41.7	8.3	12
<b>Literacy Status</b>								
Literate	66.7	33.3	51	29.4	50	20.6	0	34
Illiterate	74.8	25.2	143	24.3	34.6	33.6	7.5	107
<b>Total</b>	<b>72.7</b>	<b>27.3</b>	<b>194</b>	<b>25.5</b>	<b>38.3</b>	<b>30.5</b>	<b>5.7</b>	<b>141</b>

[Source: Field Study 2016]

The higher proportions of female have been faced mental problems than proportion of male population and among of having mental problems the female population falls neglect or depression than male population. Similarly, the people aged 80 years and above have been faced mental problems more than other age groups. Feeling insecurity and boredom / stress was higher in age group 80 years and above population and neglect or depression was also

higher in age group 80 years and above. In all caste / ethnicity higher proportion of population has been faced mental problems. Among of them more Dalits people have been faced mental problems than other caste / ethnic group and among of Dalits people who have been faced mental problems, higher proportions faced the problems boredom / stress and loneliness. Similarly, the higher proportions of illiterate population have been faced mental problems but no one literate people faced the neglect or depression.

Most of the old aged populations who involved in focus group discussion (FGD) said that they have not mental health problems. In their own word appearance of the mental health problems is the symptoms of mad or mental disordered. But they said that they have the problems like feeling insecurity, felling boredom, mental stress, feeling loneliness and so on, so we can say that they have wrong knowledge about mental health problems. The older populations have various mental tensions about their physical condition, family situation, and other various factors. After the earthquake many older populations lose their wealth, some population lose their domestic animal and some population lose their relatives, so they are in various mental problems. An older woman in Tamang community said, “Do not remind me that situation.” Many older populations are in tension by losing the wealth, which was earned by hard working in their young age.

*Situation of Health Checkup among Old Aged Population*

Health checkup is most important factor to find out the health problems and to minimize the health problems. In the context of Nepal practices of health checkup is very poor and in rural area the practice of health checkup also poor. Many of the people do not visit the health institution and does not health checkup.

**Table 5: Health checking behaviors and reasons of do not health checkup**

Variables	Health checkup after problems appeared			Reasons of not health checkup				
	Yes	No	Total (n)	Normal problems	Health institution is far from home	Lack of money	Lack of caregiver to go to health institution	Total (n)
<b>Gender</b>								
Male	34.7	65.3	95	85.5	0	4.8	9.7	62
Female	24.4	75.6	78	67.8	3.4	6.8	22	59
<b>Age Group</b>								
60-69	28.2	71.8	71	88.2	0	5.9	5.9	51
70-79	38.1	61.9	63	74.4	5.1	7.7	12.8	39
80+	20.5	79.5	39	61.3	0	3.2	35.5	31
<b>Caste / Ethnicity</b>								
Brahman/Chhetri	38.1	61.9	97	76.7	1.7	5	16.7	60
Newar/Gurung	25	75	16	83.3	0	0	16.7	12



Tamang	10.4	89.6	48	79.1	2.3	2.3	16.3	43
Dalits	50	50	12	50	0	50	0	6
<b>Literacy Status</b>								
Literate	35.6	64.4	45	86.2	0	3.4	10.3	29
Illiterate	28.1	71.9	128	73.9	2.2	6.5	17.4	92
<b>Total</b>								
	<b>30.1</b>	<b>69.9</b>	<b>173</b>	<b>76.9</b>	<b>1.7</b>	<b>5.8</b>	<b>15.7</b>	<b>121</b>

[Source: Field Study 2016]

The elderly peoples of the study area only 30.1 percent old aged population has been checkup their health after problems appeared and 69.9 percent did not check up their health after problems appeared. Among of them 75.6 percent female and 65.3 percent male did not check up their health after problems appeared. According to age group 79.5 percent of people aged 80 years and above did not check up their health after problems appeared.

Among of the Dalit people 50 percent did not check up their health after problems appeared and 71.9 percent of illiterate people did not check up their health, which is higher than literate people. Among of the old aged populations who did not check up their health, 76.9 percent of them did not check up their health due to the thoughts these problems were normal problems and some people did not check up their health due to the economic problems, lack of caregiver to go to the health institution and health institution was far from the house.

At the time of personal interview an old man above 90 years proudly said, "I have not taken any injection from birth to today, so I am healthy." From this statement we can say that the condition of health checkup is very poor.

#### *Effect of Earthquake among Old Aged Population*

Every disaster affects for all populations but degree of effects is different i.e. child, youth and old aged population. After the earthquake disaster the old aged populations of study area faced the various types of problems and various effects were appeared in their lifestyle.

**Table 6: Effect of Earthquake among Old Aged Population**

Variables	Number	Percent
<b>Physical Injuries from Earthquake</b>		
Yes	41	21.1
No	153	78.9
<b>Place of Living After Earthquake</b>		
Temporary Shelter	175	90.2
Own home/House	19	9.8
<b>Problems to living Temporary Shelter</b>		
No Problems	48	24.7
Lack of Space	66	34.0
Without walls and Partitions	20	10.3
Problems to change dress	18	9.3
Problems of cold	29	14.9

Fear of snake and other wild animals	13	6.7
<b>Total</b>	<b>194</b>	<b>100.0</b>

[Source: Field Study 2016]

In the study area 21.1% of old aged populations faced physical injuries and 78.9 % did not face the physical injuries from earthquake. After the earthquake disaster more than 90 % of respondents were living in temporary shelter and they faced the various types of problems to living in temporary shelter such as lack of space, without partitions and walls, problems to change dress, problems of cold, fear of snake and other wild animals and so on. Among of the total respondents 24.7 % did not face any kind of problems to living temporary shelter but 34 % were faced the problems of lacking space, 14.9 % faced problems of cold, 10 .3 % faced the problems related without partition and walls. Likewise, 9.3 % faced problems to change dress and 6.7 % faced the fear of snake and other wild animals.

### CONCLUSION

In the study area, a significant proportion of the elderly population (73.7%) were found to be illiterate, highlighting the need for literacy programs tailored to older adults. Additionally, 56.2% of the study population relied on economic resources for their daily needs, indicating their active engagement in economic activities. Despite facing various physical and mental health issues, a large number of respondents exhibited poor health-seeking behavior due to factors such as lack of awareness, financial constraints, and limited access to healthcare facilities. Therefore, targeted health programs focusing on the elderly population are essential in this area. Following the earthquake disaster, over 90% of the elderly population were forced to live in temporary shelters, leading to numerous challenges. It is crucial to prioritize rescue and relief efforts for the elderly in affected areas to address their specific needs and ensure their well-being. The elderly population possesses valuable skills, experiences, and knowledge that are vital for the reconstruction and development of the nation. Leveraging the expertise and wisdom of older individuals can serve as a cornerstone for rebuilding families, communities, and the country as a whole.

The study has some limitations. Firstly, due to a small sample size, the results of this study may not be generalizable to the entire population of Nepal. Secondly, the study was conducted in Thanapati VDCs. Thirdly, this study was undertaken to fulfill the requirements of a Master's in Population Studies at CDPS, TU.

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