KNOWLEDGE REGARDING EARTHQUAKE PREPAREDNESS AMONG THE PEOPLE OF BIRATNAGAR SUB-METROPOLIS OF EASTERN NEPAL

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ABSTRACT

Introduction

Earthquake preparedness is necessary strategy and action that is done before an earthquake happens in order to decrease mortality and morbidity. Earthquake in Nepal killed more than 8000 people in 2015. Increased number of deaths were mainly considered due to lack of earthquake preparedness and necessary safety measures.

Objectives

The aim of this study was to assess the knowledge regarding earthquake preparedness and to find out relationship between the level of knowledge and with their selected socio-demographic variables.

Methodology

A cross sectional study was conducted among the people residing in ward number 11 and 18 of Biratnagar sub-metropolis from 1st July to 1st October 2015. Wards were selected through simple random sampling and 110 participants were selected through convenient sampling. Each participant had completed an interviewer-administered questionnaire. Descriptive and inferential statistics was applied for data analysis.

Result

Among 110 participants, 51.8% had knowledge score between 51% to 75%, 24.6% had knowledge score below 50% and only 23.6% had knowledge score above 75%. This research showed that there was significant relationship between knowledge and age, marital status, educational status, occupation and monthly income. Participants from 20 to 39 year had more knowledge score than participants from 40 to 60 years. The higher the educational status; more was the knowledge score. Unmarried participants had more knowledge score than married participants and business holders had more knowledge score than other occupation category.

Conclusion

Earthquake preparedness knowledge among participants was inadequate. Therefore, educational intervention program regarding this is required in these areas.

KEY WORDS

Earthquake, knowledge, Nepal

INTRODUCTION

An earthquake is the perceptible shaking of the surface of the earth, which can be violent enough to destroy major buildings and kill thousands of people. The recent massive destructive earthquake occurred in Nepal on 25th April, 2015 AD with the magnitude of 7.8 Richter scale. Another major earthquake was felt on 12th May, 2015 AD of 7.2 Richter scale. These earthquakes killed more than 8000 people in Nepal and injured more than 23000.[1-4] Earthquake preparedness is necessary action and strategy that is implemented before an earthquake happens and is done in order to prevent hazards and casualty during an earthquake.[5] Preparedness efforts also aim at ensuring that the resources necessary for responding effectively in the event of a disaster are in place, and one should know how to use those resources. The activities that are commonly associated with disaster preparedness include developing planning processes to ensure readiness; formulating disaster plans; stockpiling resources necessary for effective response; and developing skills and competencies to ensure effective performance of disaster-related tasks.[6] However, people in both developing and developed countries do not utilize these actions. In a developed country like China knowledge regarding earthquake preparedness was only found to be 51% and level of education was found to be significantly associated with it.[7] In a study at Dhaka of Bangladesh, the majority of the participants were not prepared for a major earthquake.[8] This data along with other research study documents that people in developing countries are six times more likely to die from earthquake than the people in developed country.[9] Nepal is a seismic prone country and the risk it faces from earthquakes are very high. Past records have shown that Nepal can expect two earthquakes of 7.5-8 Richter scale every forty years and one earthquake of magnitude of 8+ Richter scale every eighty years.[4] The preparedness level of Kathmandu citizen (n=430) was only found to be 50.3% although 92.6% of the participants had expressed their concern regarding earthquake preparedness.[9] A positive correlation between earthquake knowledge and earthquake preparation indicated that participants with more earthquake preparedness knowledge were more likely to be prepared for earthquake.[10] Considering the knowledge and negligence about earthquake preparedness as a key factor to prevent the hazards and casualties by earthquake next time and to contribute something towards up-liftmen of this worse condition of country, researchers were interested in study related to knowledge regarding earthquake preparedness. The objectives of the study were to assess the knowledge about earthquake preparedness among the people of selected ward of Biratnagar and to find out the relationship between the knowledge score and with their selected socio-demographic variables.

METHODOLOGY

A community based cross sectional study was conducted among 110 participants residing in ward number 11 and 18 of Biratnagar sub-metropolis of Morang District in Eastern Nepal from 1st July to 1st October 2015. Simple random sampling technique using lottery method without replacement was used to select the wards, and participants were selected using non-probability convenience sampling method. Sample size was calculated by using the formula [$N= z^2p(1-p)/d^2$], prevalence rate of (51%)[6] was used for this study at 95% confidence interval and 10% degree of precision. Sample size was divided equally among the two wards. Participants over the age of 20 years and both gender and only one participant from each family were included in the study. Participants who were seriously ill during the data collection period were excluded from the study. Ethical approval was taken from concerned authority of Nobel Medical College and Teaching Hospital, Biratnagar. The permission to conduct research was also taken from the local ward office. The confidentiality was maintained by coding the participants name in the questionnaire, without disclosing the participants information to others. Informed consent was taken from participants prior to data collection. Newly formed interviewer administered questionnaire was used and its validity and reliability was tested. Pretesting of these questionnaires was done in 10% of sample in ward number 10 and these data were not included in final study. Questionnaire was categorised into 2 parts: Socio-demographic information (10 questions) and knowledge based structured questionnaire regarding earthquake, earthquake preparedness, property protection preparedness during earthquake and life protection preparedness during earthquake (20 questions in total). Each correct answer was scored as one and a wrong answer scored as zero. The maximum score was 20. The score of knowledge was converted into percentage and categorised into below 50%, 51% to 75% and 75% above. Collected data was entered in Microsoft Excel and analysed by SPSS version 17. Data was presented by using both descriptive and inferential statistics (t test and one way ANOVA test). The P value was considered significiant at 95% confidence interval.

RESULT

Table 1: Socio-demography profile of study participants (n=110)

Characteristic	Number	Percentage (%)
Age in years		
20-29	40	36.4
30-39	25	22.7
40-49	11	10.0
50-59	8	7.3
60 above	26	23.6
Sex		
Male	55	50.0
Female	55	50.0
Marital status		
Married	77	70.0
Unmarried	22	20.0
Widow/Widower	11	10.0
Ethnicity		
Upper higher caste	31	28.2
Relativelydisadvantage Janjati	6	5.5
Dalit	13	11.8
Relatively disadvantage non-dalit terai group	51	46.4
Religious minorities	9	8.2
Religion		
Hindu	101	91.8
Muslim	9	8.2
Type of family		
Nuclear	47	42.7
Joint	63	57.3
Educational status		
Illiterate	33	30.0
Literate	16	14.5
Primary Level	26	23.6
Secondary Level	15	13.6
Higher Secondary and above	20	18.2
Occupational status		
Farmer	10	9.1
Labor	28	25.5
Household	35	31.8
Service	14	12.7
Business	12	10.9
Student	11	10.0
Monthly Income(In NRs)		
5000-10000	46	41.8
10001-15000	21	19.1
15001-20000	19	17.3
20001-25000	10	9.1
25001above	14	12.7
Home Ownership		
Owner	97	88.2
Tenure	13	11.8
Experience of earthquake	110	100.0
Training related to earthquake preparedness not taken	110	100.0

Table 1 represents socio-demography of study participants. Out of 110 participants, 36.4% were of age group 20-29 years with equal gender distribution. Majority (70%) was married and 46.4% of participants were of relatively disadvantage non-dalit terai group. Majority (91.8%) were Hindu and from joint family (57.3%). Majority of participants were illiterate and 31.8% of participants were household worker. Majority (41.8%) had income of range NRS. 5000-10000. Majority (88.2%) of participants had their own home. All the participants were exposed to earthquake but no one had exposure to any training on earthquake preparedness.

Figure 1: Knowledge score of participant(n=110)

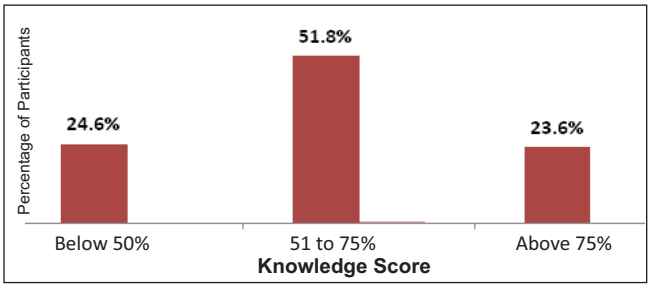

Figure 1 shows that 51.8% of participants had knowledge score between 51 to 75% followed by 24.6% of the participants had knowledge score below 50% and 23.6% of the participants with knowledge score above 75%. Where as the mean knowledge score was 12.95 ±3.64 and mean knowledge percentage was 64.77% ± 18.20.

Table 2: Relationship between knowledge and elected variables (n=110)

Characteristic	Score of Knowledge % (Mean±SD)	P value
Age in Years		
20-29	70.25±13.10	p<0.01*
30-39	70.00±14.06	
40-49	67.73±24.01	
50-59	65.00±18.20	
60 above	50.00±16.91	
Sex		
Male	65.55±17.86	p=0.702**
Female	64.00±18.66	
Marital Status		
Married	65.71±17.41	p=0.002*
Unmarried	70.23±15.99	
Widow/Widower	47.27±19.02	
Ethnicity		
Upper higher caste	72.58±16.42	p=0.111 *
Relativelydisadvantage Janjati	63.33±20.65	
Dalit	64.62±19.19	
Relatively disadvantage non -dalit terai group	61.37±18.08	
Religious minorities	58.33±16.77	
Religion		
Hindu	65.35±18.29	p=0.933**
Muslim	58.33±16.77	
Type of Family		
Nuclear	69.04±17.68	p=0.888**
Joint	61.59±18.06	
Education Status		
Illiterate	46.52±15.78	p<0.01*
Literate	63.75±10.87	
Primary Level	67.88±11.93	
Secondary Level	74.67±7.89	
Higher Secondary and above	84.25±9.21	
Occupational Status		
Farmer	59.50±11.65	p<0.01*
Labor	75.00±10.95	
Household	59.64±17.84	
Service	57.86±20.23	
Business	78.93±10.22	
Student	5.42±12.87	
Montly Income (NRS)		
5000-10000	59.35±17.87	p<0.01*
10001-15000	57.38±18.27	
15001-20000	75.79±13.36	
20001-25000	73.92±15.38	
25001above	64.77±18.20	
House Ownership		
Owner	63.57±17.92	p=0.627**
Tenure	74.23±18.12	

* One way ANOVA ** t-test

Table 2 shows there was statistically significant relationship between knowledge and age, marital status, educational status, occupation and monthly income where as there was no statistically significant relationship between knowledge and sex, ethnicity, religion, family type and home ownership. Age group 20-39 had more knowledge score than other age group and unmarried participants had more knowledge score than married participant. The more the educational level, higher was the knowledge score where as knowledge score was seen more among the business holder than other occupational category.

DISCUSSION

This research finding revealed that the mean knowledge percentage of the participants was 64.77%. Majority of participant(51.8%) had knowledge score between 51 to 75%. Similar cross sectional study showed that 56.1% of Tehran resident had knowledge score below 50% which is in contrast with the result of this study.[5] This difference may be due to different format of questionnaires used. This study showed significant relationship between knowledge and age ($p<0.01$) which is supported by study conducted by Mahmoud Nekoei Moghadam et al in Iran where significant relationship between age and knowledge was found ($p=0.001$).[11] Knowledge was found to be more among the younger age group participants which is also supported by the study conducted in Iran.[5] In contrast to this study, the study conducted by Oral M et al in Turkey revealed no statistical significance between age and knowledge, this might be due to different format of questionnaire used and research conducted in Turkey was done in the area where earthquake had caused massive damage.[6]

In this study there was no significant relationship between knowledge and sex ($p=0.702$) and this result was supported by study conducted by Tuladhar G et al 2015 in Nepal.[12] Although in both of the studies, knowledge was not statistically significant with sex but knowledge score was slightly more among the male participants in both of the studies. In contrast to this, study conducted by Ostad Taghizadeh A et al in 2009 revealed that the knowledge score was more among the female participants and this difference might be due to different educational status among the female participants.[5]

This study showed significant relationship between knowledge and marital status ($p=0.002$) which was supported by study conducted by Mahmoud M et al which showed significant association between marital status and knowledge ($p=0.001$).[11] This study revealed significant relationship between knowledge and educational status ($p<0.000$) which was supported by study conducted by Tekeli-Yesil S et al at Istanbul which showed significant relationship between knowledge and educational status ($p=< 0.001$).[13] It was further supported by study conducted by Ostad Taghizadeh A et al in 2009.[5] All of these studies revealed that, the more the educational status, the higher the knowledge scores.

Statistically significant relationship between knowledge and occupation ($p<0.00$)was revealed in this study, which was supported by study conducted by Ostad Taghizadeh A et al in Tehran which showed significant association between knowledge and occupation ($p=0.040$).[5] Home ownership was not statistically significant with knowledge in this study ($p=0.627$) which was also supported by study conducted by Ostad Taghizadeh A et al in Tehran($p=0.949$).[5] However, it was contrasted by study conducted by Oral M et al in Turkey which showed significant association between knowledge and home ownership.[6] As the study in Turkey was study was conducted in area which has sustained great infrastructure damage by recent earthquake, increased knowledge scores among property owners was more which is in contrast with this study.

CONCLUSION

The findings of this study revealed that people residing in Biratnagar sub-metropolis didn't have satisfactory knowledge scores regarding earthquake preparedness. Educational status was one of the major factor associated to increase the knowledge regarding earthquake preparedness.

RECOMMENDATION

To mitigate the damage from future earthquakes, it will be important to increase the people's educational status as well as their knowledge about earthquake preparedness. Intervention targeted to increase the knowledge regarding regarding earthquake preparedness is recommended.

LIMITATION OF THE STUDY

This study could not be generalised in large population due to small sample size.

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CONFLICT OF INTEREST

We declare no conflict of interest.

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