International Journal of Community Medicine and Public Health
Gautam L et al. Int J Community Med Public Health. 2021 Dec;8(12):5643-5648
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20214550

Original Research Article

Long term post-traumatic stress disorders among the earthquake affected people of Sindhupalchwok, Nepal

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Received: 27 September 2021
Accepted: 03 November 2021

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ABSTRACT

Background: People who are suffering from PTSD have disturbing feelings and thoughts which is related to their experience even after a long time of such traumatic events happened. This study highlight the characteristics and prevalence of PTSD among the earthquake survivors.
Methods: Cross sectional study was carried out using standard PCL-5 PTSD questionnaire. Interview was taken among 376 survivors of earthquake after 4 years of earthquake in Sindhupalchok. Descriptive statistics, Chi-square test and multiple logistic regression were used to describe data and test association.
Results: The mean age of the respondents was 39.47±16.18 years. Almost 2/5th of the respondents were either buried, injured or physically or mentally disabled during earthquake. Majority of the survivors had loss their loved one while most of them loss their property. Among the respondents who were buried 28.6% had develop PTSD which was 22.2% among physical or mental disable during earthquake. PTSD showed significant association with age, loss of known person and loss of property however didn't show with gender, caste, experience of earthquake and so on. The prevalence of PTSD was 71 (21.5%) out of 331 respondents. Female (63.4%) were more prone to PTSD than male (36.6%).
Conclusions: PTSD is prevalent among 21.5% of survivors even after 4 years of earthquake which showed an urgent need to address PTSD among the respondents and immediate intervention to prevent and treat such problems in case of future disasters.

Keywords: Earthquake, Long-term, Prevalence, PTSD

INTRODUCTION

In 2015, Nepal experienced a destructive temblor of 7.8 magnitude followed by 7.3. Altogether, 8,979 people lost their lives and 22,309 were injured in the 2015 Earthquake.[1] Sindhupalchok one of the most severely affected districts in Nepal has total 3,570 deaths, 1,435 injuries with 96% household destruction.[2] Natural disasters like earthquake have devastating effect among human beings. People who experienced or witnessed disasters might develop psychological condition. The most common psychological problem among the survivors is post-traumatic stress disorders (PTSD). People suffering from PTSD have disturbing feelings and thoughts, related to the experience of traumatic events even after long period.

Many survivors had lost their loved one and they had unforgettable trauma which might hunt them throughout their life. This study highlight the characteristics and prevalence of PTSD among the earthquake survivors of Shindhupalchok district after 4 years of earthquake.

METHODS

This study was conducted in four wards of Chautara Sangachokgadi Municipality- 8,10,12,13 named as Irkhu, Jalkini, Thulosirubari and Sangachok of Shindupalchok district respectively. Since it was one of the most devastated area of Nepal earthquake, 2015. This cross sectional study was conducted after 4 years of earthquake in May 2019 among the residents of study area, above 14 years of age. The wards were selected randomly and households were chosen using systematic random sampling. Sample size was calculated with reference of Haiti earthquake which was 36.75%.[3] PTSD prevalence in 95% confidence interval with 10% non-response rate which was 376 which was distributed proportionally to all wards. Interview was taken using structured questionnaire. PTSD Checklist for DSM-5 (PCL-5) was used to assess the prevalence of PTSD.[4] The PCL-5 is a 20-item self-report questionnaire with a score of 0-4 for each question and maximum score of 80. To assess the presence or absence of PTSD symptoms individual who had PTSD score ≥33 were considered to have PTSD.[5]

Research proposal was approved from Institutional Research Committee of Manmohan Memorial Institute of Health Science (IRC/MMIHS) and all ethical considerations were followed during the whole process of study.

The data were managed according to the objective of the study using SPSS software version 21.0. Statistical analysis included descriptive statistics: mean, SD, frequency, and percent. Chi-square test and multiple logistic regression were used to assess the association between PTSD with other variables. The association of variables with p value <0.05 was considered significant. Informed consent was taken before interview including privacy, confidentiality and all other ethical issues were addressed.

RESULTS

This study was conducted in Chautara Sangachowkgadi Municipality, one of the devastated area of "Gorkha earthquake 2015". The prevalence of PTSD was 21.5% despite 4 years of the earthquake. The study was conducted among 376 respondents age ranged from 14 to 94 years of. The mean age of the respondents was 39.47±16.18 years. Majority of the respondents were 20-50 years and 43% were Janajati by caste. Half of the respondents belongs to nuclear family and two out of five respondents had more than 3 siblings followed by 2 siblings (29.7%) (Table 1).

Regarding the earthquake related experience of respondents almost 2/5th respondents were either buried, injured, physically or mentally disabled. Majority of the survivors had loss known person while almost all lost their property. Above three quarter of the respondents had witnessed the victims of the earthquake (Table 2).

Table 1: Socio-demographic information.

Indicators	Frequency	Percentage (%)
Age group (years)		
14-19	32	8.5
20-35	146	38.8
36-50	136	36.2
51-64	27	7.2
>64	35	9.3
Total	376	100.0
Gender		
Female	203	54.9
Male	167	45.1
Total	370	100
Caste		
Brahmin	44	12.4
Chhettri	129	36.4
Janajati	155	43.8
Dalit	26	7.3
Total	354	100.0
Family type		
Nuclear	183	50.6
Joint	169	46.7
Extended	10	2.8
Total	362	100

Table 2: Experiences related to exposure of earthquake.

Indicators	Frequency	%
Earthquake effect		
Buried	32	8.6
Injured	85	22.8
Physical or mental disability	19	5.1
None	231	62.1
Total	372	100
Loss of a known person		
Father	12	3.2
Mother	27	7.3
Friends and relatives	49	13.2
Family members	115	31.0
None	168	45.3
Total	371	100
Property loss		
Minimum	35	9.4
Medium	132	35.4
Maximum	171	45.8
None	35	9.1
Total	373	100
Seen cases of injury, physical and mental disability		
Yes	287	78.0
No	81	21.7
Total	368	100

Table 3 illustrate the information about the different indicators to calculate PTSD according to PCL-5 score.

The range is from nothing to extreme level. Although, after 4 years of earthquake the disturbance is still present among respondents. Keeping distance from earthquake related things is still in extreme level among 12.4% of the respondents while event during earthquake that still causes sadness is extreme among 11.8% of them. Loss of weight without my will and feeling of self-responsible for earthquake related events and experience was least prevalent among the respondents. All 20 indicators of PCL 5 are significantly associated with PTSD with <0.001 p value.

Table 3: Effects of earthquake among respondents.

Effects of earthquake	Nothing at all	Minimum	Medium	Maximum	Extreme	Total
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Remembrance of earthquake	40 (10.7)	136 (36.3)	94 (25.1)	76 (20.3)	29 (7.7)	375 (100)
Traumatic dreams of earthquake	144 (38.4)	124 (33.1)	67 (17.9)	32 (8.5)	8 (2.1)	375 (100)
Feeling of tremors	91 (24.3)	107 (28.5)	100 (26.7)	68 (18.1)	9 (2.4)	375 (100)
Any event during earthquake that still causes sadness	52 (14.0)	115 (30.9)	103 (27.7)	58 (15.6)	44 (11.8)	372 (100)
Body's response on remembrance of earthquake(inability to breathe, sweating and so on)	141 (37.8)	116 (31.1)	68 (18.2)	36 (9.7)	12 (3.2)	373 (100)
Keeping distance from earthquake related things	64 (17.3)	111 (30.0)	85 (23.0)	64 (17.3)	46 (12.4)	370 (100)
Keeping distance from earthquake related external things	76 (20.5)	100 (27.0)	95 (25.7)	61 (16.5)	38 (10.3)	370 (100)
Inability to remember important things due to remembrance of earthquake	108 (29.3)	121 (32.9)	75 (20.4)	47 (12.8)	17 (4.6)	368 (100)
Feeling of self-responsible for earthquake related events and experience	197 (53.7)	84 (22.9)	50 (13.6)	25 (6.8)	11 (3.0)	367 (100)
Intact negative thoughts like fear, anger, blame, shame	142 (38.3)	122 (32.9)	71 (19.1)	27 (7.3)	9 (2.4)	371 (100)
Do not want to do the activities that were joyful in past	178 (48.1)	109 (29.5)	54 (14.6)	19 (5.1)	10 (2.7)	370 (100)
Feeling of separation and going apart from people	165 (44.7)	106 (28.7)	51 (13.8)	29 (7.9)	18 (4.9)	369 (100)
Problems to think positive not feeling happy	176 (47.8)	122 (33.2)	47 (12.8)	15 (4.1)	8 (2.2)	368 (100)
Anxiety, anger and irritability	164 (44.4)	122 (33.1)	51 (13.8)	23 (6.2)	9 (2.4)	369 (100)
Tendency not to sleep	134 (36.4)	94 (25.5)	65 (17.7)	53 (14.4)	22 (6)	368 (100)
Easily frightened	135 (36.9)	121 (33.1)	62 (16.9)	37 (10.1)	11 (3)	366 (100)
Loss of weight without my will	233 (63.5)	71 (19.3)	40 (10.9)	16 (4.4)	7 (1.9)	367 (100)
Inability to focus on the things	163 (4.1)	126 (34.1)	51 (13.8)	24 (6.5)	6 (1.6)	370 (100)
Difficulty sleeping	181 (49.1)	96 (26.0)	50 (13.6)	29 (7.9)	13 (3.5)	369 (100)

The average score of PTSD was 22.48±13.57 with minimum score 0 to maximum 74 out of 80. The prevalence of PTSD was 71 (21.5%) out of 331 respondents. Half of the respondents who developed PTSD were from age group 36-50 years (50.7%) followed by 20-35 years (29.6%). Female (63.4%) were more prone to PTSD than male (36.6%), among those respondents who had PTSD 45.56% were Chhetri followed by Janjati (35.3%) (Table 4).

Among the 71 respondents who developed PTSD 42.25% had loss their family members other than father and mother while 23.9% hadn't lost anyone. Half of the respondents had PTSD score more than 32 even though they were not injured, buried or had physical or mental disability.

Among the respondents who were buried 28.6% had develop PTSD which was 22.2% among Physical or mental disable during earthquake. PTSD was more prevalent among the survivors who lost their parents and proportion of PTSD was in increasing trend according to the severity of property loss.

Almost half (49.3%) of the respondents who developed PTSD had lost maximum level of property. PTSD was

significantly association with age, loss of known person and loss of property however not associated with gender, caste, experience of earthquake and so on (Table 5).

Table 4: Association of different indicators with PTSD.

Characteristics	PTSD status		Total	P value
	Absent N (%)	Present N (%)		
Age categories				
14-19	23 (79.3)	6 (20.7)	29	0.04
20-35	109 (83.8)	21 (16.2)	130	
36-50	83 (69.7)	36 (30.3)	119	
51-64	17 (77.3)	5 (22.7)	22	
>64	28 (90.3)	3 (9.7)	31	
Total	260 (78.5)	71 (21.5)	331	
Gender				
Female	146 (77.2)	43 (22.8)	189	0.41
Male	111 (81.0)	26 (19.0)	137	
Total	257 (78.8)	69 (21.2)	326	
Caste				
Brahmin	28 (75.7)	9 (24.3)	37	0.46
Chhettri	91 (74.6)	31 (25.4)	122	
Janajati	112 (82.4)	24 (17.6)	136	
Dalit	14 (77.8)	4 (22.2)	18	
Total	245 (78.3)	68 (21.7)	313	
Number of siblings				
None	12 (80.0)	3 (20.0)	15	0.86
1	26 (72.2)	10 (27.8)	36	
2	77 (80.2)	19 (19.8)	96	
3	34 (75.6)	11 (24.4)	45	
>3	97 (78.9)	26 (21.1)	123	
Total	246 (78.1)	69 (21.9)	246	
Family type				
Nuclear	132 (82.0)	29 (18.0)	161	0.25
Joint	109 (73.2)	40 (26.8)	149	
Extended	5 (83.3)	1 (16.7)	6	
Total	246 (77.9)	70 (22.1)	316	

Table 6 shows the presence of PTSD is significantly associated with the age categories and loss of a known person. The person in the age group 36-50 (OR: 3.836, 95% CI for OR: 1.014-14.514) were 3.836 times more likely to presence of PTSD as compared to the person in the age group >64 (reference age group).

Similarly, respondents who lost their father (OR: 9.501, 95% CI for OR: 2.125-42.492), mother (OR: 9.027, 95% CI for OR: 2.861-28.487), friends and relatives (OR: 3.321, 95% CI for OR: 1.271-8.679) and family members (OR: 5.068, 95% CI for OR: 2.380-10.790) were 9.501, 9.027, 3.321 and 5.068 times more likely to develop PTSD respectively as compared to those who didn't loss known person because of earthquake.

Table 5: Association of earthquake related experiences and PTSD.

Characteristics	PTSD status		Total	P value
	Absent N (%)	Present N (%)		
Effect of earthquake				
Buried	17 (60.71)	11 (39.3)	28	0.07
Injured	60 (75.9)	19 (24.1)	79	
Physical or mental disability	13 (72.2)	5 (27.8)	18	
None	163 (82.3)	35 (17.7)	198	
Total	253 (78.7)	70 (21.3)	323	
Loss of a known person				
Father	5 (50.0)	5 (50.0)	10	0.00
Mother	14 (63.6)	8 (36.4)	22	
Friends and relatives	33 (75.0)	11 (25.0)	44	
Family members	72 (70.6)	30 (29.4)	102	
None	134 (88.7)	17 (11.3)	151	
Total	258 (78.4)	71 (21.6)	329	
Loss of property				
Minimum	27 (84.4)	5 (15.6)	32	0.04
Medium	88 (74.6)	30 (25.4)	118	
Maximum	114 (76.5)	35 (23.5)	149	
None	29 (96.7)	1 (3.3)	30	
Total	258 (78.4)	71 (21.6)	329	
Witnessed the cases of injury, physical and mental disability				
Yes	202 (77.7)	58 (22.3)	260	0.34
No	54 (83.1)	11 (16.9)	65	
Total	256 (78.8)	69 (21.2)	325	

Table 6: Multiple logistic regression analysis for post-traumatic stress disorder.

Variable	P value	Odds ratio (OR)	95% CI for OR	
			Lower	Upper
Age categories	0.01			
14-19	0.516	1.689	0.347	8.231
20-35	0.874	1.117	0.284	4.391
36-50	0.048	3.836	1.014	14.514
51-64	0.631	1.564	0.252	9.723
>64®		1		
Loss of a known person	0.000			
Father	0.003	9.501	2.125	42.492
Mother	0.000	9.027	2.861	28.487
Friends and relatives	0.014	3.321	1.271	8.679
Family members	0.000	5.068	2.380	10.790
None®		1		

Values in bold are significant at p<0.05: -2 Loglikelihood =256.29; χ^2 (8) =41.25, p=0.0000, Hosmer-Lemeshow statistics =3.03 with 7 df, p=0.88, ® reference category, OR=odds ratio and CI=confidence interval.

DISCUSSION

On 25 April 2015, a 7.8 magnitude earthquake struck Nepal, killing 8700 people and injuring 22,000.[6] A second earthquake hit the country on 12 May, added 2500 injuries and 200 deaths especially in Sindhupalchok.[7] PTSD is common after terrible experience of disasters like earthquake. Predominantly, with time it subsides gradually. However, occasionally disasters could be the reason for severe psychological disturbances among survivors losing close people. Even after certain period of time of disaster the psychological effect are still prevalent among the affected district Sindhupalchowk. The age of respondents in this study was 39.47±16.18 years ranged from 14 to 94 years of age which was slightly different than the study conducted by Adhikari et al which was 43.60±14.40 ranged from 82 years and female participants (54.9%) were higher in the present study than the study conducted by Adhikari et al which was (43.06%).[8] The major caste of participants was similar but type of family was different than the study conducted by Mishra et al.[9]

This study found 37.9% of the respondents were either buried, injured or physically or mentally disturbed due to the earthquake which differs from the study conducted by Adhikari et al in Nuwakot showed just 2.41% which might be due to the level of severity of earthquake in study area.[8]

A study conducted after Lorca's earthquakes 16.8% of the respondents had lost family members, friends or neighbor's however the proportion of the respondents who lost important people lives was 54.7% in the present study.[10] More than 90% of the respondents lost their property in this study however different study showed different proportion of property loss ranged from 93.13% to 32.6%.[1,10]

Prevalence of PTSD in this study was 21.5%, higher among women (22.8%) than men (19%) after 4 years of earthquake. Different study showed the diverse proportion of PTSD ranging from 4.4% to 45.5%[3,8,9,11-18] Study revealed that women are more susceptible to PTSD than male which was similar with the findings of other study.[8,19] The dispersion of PTSD is likely to be due to duration of earthquake, magnitude of earthquake and severity of damage and loss.

Present study PTSD showed significant association with age, family type, loss of known person and loss of property however didn't show significant association with gender, caste, experience of earthquake and so on. Study conducted by Adhikari et al also showed the association of PTSD with age, injury to respondents and no association with gender and loss of property.[8] A study after Wenchuan earthquake revealed that deaths in families and household damage were significantly related to PTSD.[14] Another study by Mishra et al showed significant association of PTSD with earthquake exposure and loss of known person.[9]

If this study was conducted immediately after the earthquake, there might be high probability of early case detection and prompt treatment. The prevalence of long term effect would be minimized.

CONCLUSION

The study was conducted after 4 years of earthquake and still 21.5% of the respondents still have crossed the cutoff point for PTSD. Which revealed the severity of disaster even after long period of time and needed immediate action to prevent the consequences of such psychological issues. Psychological counselling, time to time screening for early diagnosis and prompt treatment together with long term follow up seems to be an urgent needs of the people living in severely destructed places like Sindhupalchok to forget the sorrow and live a normal life.

ACKNOWLEDGEMENTS

Contribution of public health students of MMIHS: TU-7th batch during data collection and 8th batch in data entry is highly appreciated. The cooperation of the respondents from the study area are is also greatly appreciated.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee Manmohan Memorial Institute of Health Science

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Cite this article as: Gautam L, Mishra DK, Pant GP, Khadka R, Chataut PD, Shrestha T, et al. Long term post-traumatic stress disorders among the earthquake affected people of Sindhupalchwok, Nepal. Int J Community Med Public Health 2021;8:5643-8.