J. Indian Assoc. Child Adolesc. Ment. Health 2021; 17(2):12-34

Original article

Psychological Problems Among Children Three Years After the Earthquake in Nepal

Nishtha Shrestha, Baiju Gopal

Address for correspondence: Nishtha Shrestha, Department of Psychology, CHRIST (Deemed to be University), Bangalore. Email: nishtha.shrestha@gmail.com

Abstract

Background: Frequent disasters and weak mental health system pose a risk to psychological health in Nepal. In 2015, a massive earthquake of 7.6 magnitude occurred in Nepal, which caused large scale destruction to human life and property. Limited research in children after disasters in Nepal prevent health professionals from implementing new evidence-based trauma treatments.

Aim: The study aimed to identify the long term emotional problems experienced by earthquake-affected children in Nepal. The role of gender, severity of exposure, socio-economic status and type of family in relation to emotional problems were also examined in the selected group.

Methods: A purposive sampling was used to select 454 children (4th and 5th standard) from two highly affected wards in Kathmandu Metropolitan City. Information about exposure to the earthquake was collected from children using the Level of Exposure Scale while the parents completed the Nepali version of the Strengths and Difficulties Questionnaire (SDQ/ 4-17).

Results: The effect of exposure to the earthquake was identified in the children even after three years. Boys had higher conduct, hyperactivity-inattention and peer problems while girls had high pro-social behaviour. Emotional problems were greater for those belonging to a

lower socio-economic status. Among the variables, gender was a better predictor of emotional problems in earthquake-affected children.

Conclusions: Emotional problems such as conduct problems, hyperactivity-inattention, peer problems are present in the earthquake-affected children in Kathmandu. Future researchers and clinicians need to monitor the children affected by the earthquake to recognise vulnerable groups and implement appropriate trauma-focused interventions.

Keywords: Child, earthquakes, emotions, mental health, Nepal

Introduction

Disasters are a common occurrence in Nepal. From 1971 to 2016, Nepal has witnessed a total of 21,856 disasters with epidemic and earthquake, causing the highest loss of human lives [1]. Along with the unique topography, the vulnerability to disasters is further worsened by factors such as weak government, unskilled manpower and inequalities in service delivery [2]. The inability to manage recurrent disasters in the form of floods, landslides and earthquakes [3] due to the influence of these factors has worsened the chances of development in the country. After a gap of over 80 years, Nepal witnessed a 7.6 magnitude earthquake in 2015. Out of the 8 million people affected by the April earthquake, 3.2 million were estimated to be children [4,5]. The challenges faced during rescue and recovery raised concerns about the existing emergency measures in the country. The earthquake also created a demand for mental health services which were not met due to the lack of implementation of the existing mental health policies [6]. The recovery from the aftermath of the disaster continues till date though mental effects from the trauma have been sidelined in this process of reconstruction.

Disasters bring disturbance in the development of children. The sudden and variable nature of disasters makes it difficult to protect the children from being a witness to the devastation.

Research has identified certain effects of an earthquake, which includes sleep disturbances, grief, substance abuse, depression, anxiety, fear of death etc. [5,7-8]. However, the response of individuals to trauma is diverse and hard to predict due to the influence of multiple variables [9,10]. The protective mechanisms of the body such as fight, flight or freeze response is activated during an encounter with stress. Exposure to prolonged stress, however, causes an alteration in the biological processes. This over-activation of the sympathetic nervous system brings about behavioural and emotional changes such as the risk of anxiety and depression has been linked to high levels of corticotrophin-releasing hormone secreted by the hypothalamus during stress [11]. These bodily changes are experienced by individuals through their emotions, and after a trauma, it becomes difficult to regulate emotions because of this heightened sensitivity of the stress system. The problematic behaviours observed after a traumatic incident such as avoidance, aggressiveness, dissociation etc., are some of the unhealthy coping skills adopted by individuals to manage these overwhelming emotions [12]. A lack of focus on the relationship between trauma and emotions prevents the clinicians from addressing the root causes behind the reactions of the individuals.

Along with the challenges of tracing the consequences of trauma, disaster research with children is further complicated due to developmental, societal and ethical concerns [13]. There is a need to focus on the lasting physical and emotional outcomes of disasters, especially on children [14]. However, in low-income countries like Nepal, these challenges deter researchers who are already faced with financial and technological limitations to carry out relatively easier research projects [15]. In a field dominated by western ideologies, understanding the nature of trauma in children from developing countries is negligible [16]. This limited research in the mental health of children [17] reduces the treatment options for health professionals leaving the children vulnerable to the impacts of future disasters in Nepal. Emotional problems are one among the many likely outcomes after disasters but are

not researched in comparison to the widely known disorders like post-traumatic stress disorder [18].

In the current study, we aim to address this gap in trauma research by assessing the emotional problems in children three years after the earthquake. Children below 14 years constitute 34.9% of the total population of Nepal [19]. The combination of ignorance towards mental health and high vulnerability to disasters puts the young group at risk for future mental health disorders. Thus, the objective of the research is to identify the emotional problems in earthquake-affected children and the factors contributing to the long-term effects of disasters in Nepal.

Method

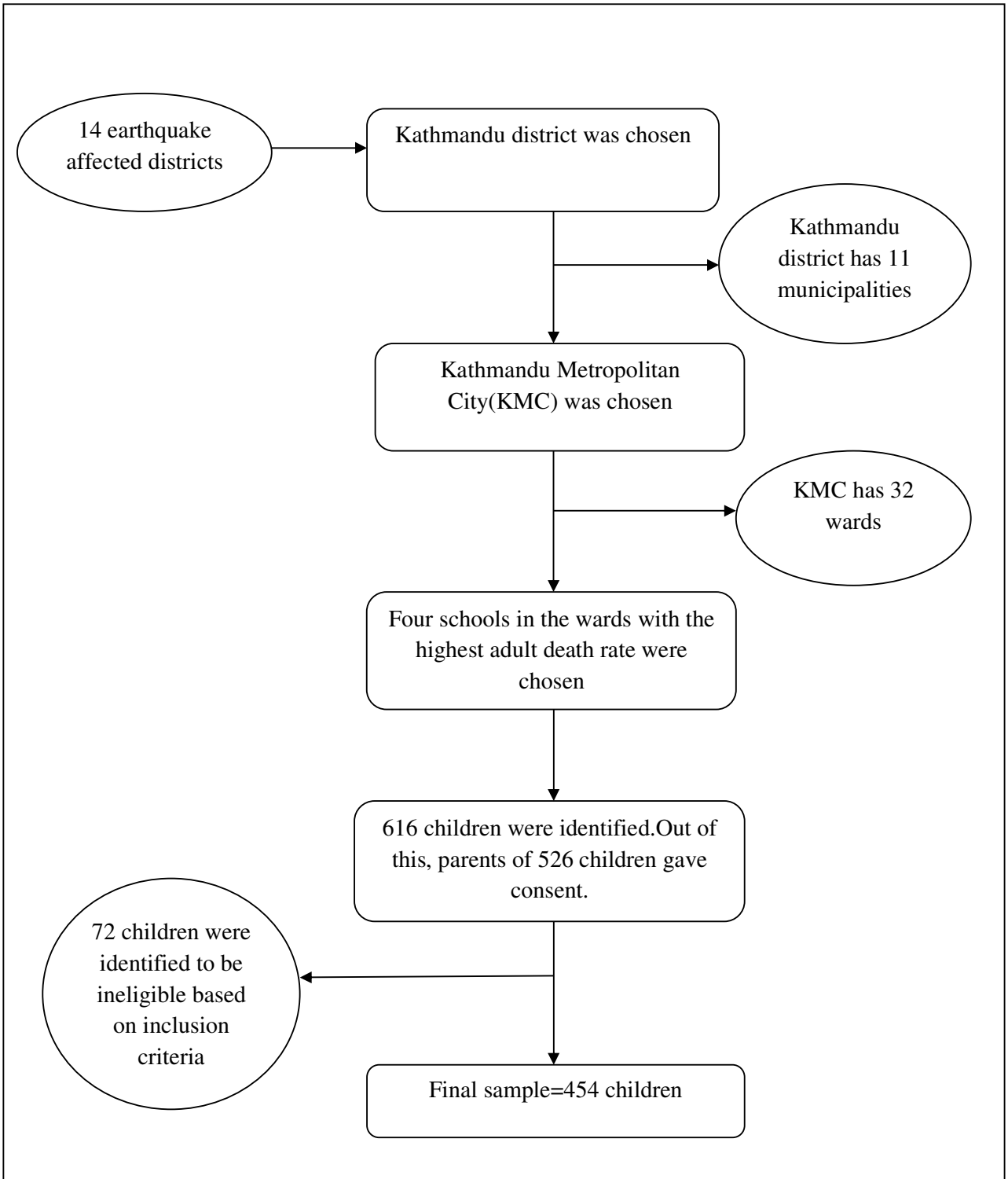
Participants

A cross-sectional research design was adopted for the study. Purposive sampling was employed to select 454 children. The children who were studying in Grade 1 and 2 (6-7 years) in 2015, present in Kathmandu at the time of the earthquake, studying in schools belonging to the wards with highest adult death(30-45 years) in Kathmandu Metropolitan City, and no prior history of mental illness and trauma were included in the study. Children who had undergone any form of professional counselling after the earthquake and had ongoing stressors in their life were excluded from the study. The total population of children studying in Grade 1 and 2 in Kathmandu district in 2015 was 87,909 [20]. For a population size above 50,000, a margin of error of 5% and a confidence level of 95%, the required sample size was calculated to be 385. However, based on the response during the pilot study, more number of children were targeted to account for factors such as loss of forms, failure to receive consent, children being present outside Kathmandu during the earthquake etc.

Procedure

The study was conducted three years after the earthquake in July 2018. A total of four schools, two government and two private, were chosen randomly from the selected wards. At the time of the study, the children were studying in 4th and 5th standard in the chosen schools. Figure-1 explains the detailed procedure of the sample selection for this study.

Figure-1: **Procedure of sample selection for the study**



Instruments

Written informed consent was taken from the institutions as well as the parents/ caregivers of the children. Children completed the assent forms in the presence of the researcher, and any apprehensions about the study were clarified prior to data collection. The study was approved by the Institutional Review Board of CHRIST (Deemed to be University) and Nepal Health Research Council (NHRC).

The researchers collected data with regard to the socio-demographic details of the child, emotional and behavioural difficulties and their level of exposure to the earthquake. Apart from the level of exposure questionnaire, which was completed by the children in the presence of the researcher, the rest of the forms were filled by the parents/caregiver. All the tools were in the Nepali language to help both children and parents understand the questions easily.

Apart from the basic socio-demographic details such as gender, ethnicity, income etc., the socio-demographic form asked the parents regarding their observations about the changes they had witnessed in their child after the earthquake, any incidents of death, injury or loss in the family or friends, presence of any recent stressors and whether the child had undergone any form of counselling after the earthquake. This allowed the researchers to ensure that the problems identified by the parents were a result of the exposure to the earthquake.

Level of Exposure Scale: Level of exposure is a self-administered questionnaire that consists of six questions about the experiences of the earthquake. The items are based on a 4-point Likert scale (1=none and 4=a great deal). The total score is computed by adding the scores of the six items. The minimum score is 0, and the maximum score is 24 [21]. Front and back translation of the tool into a Nepali version was done by official translators. The reliability

coefficient of this scale in the original study was 0.71, and in the present study, it was found to be 0.6.

Strengths and Difficulties Questionnaire(SDQ): Strengths and difficulties questionnaire (SDQ) is a 25 item scale which contains five subscales (emotional problems, conduct problems, hyperactivity-inattention, peer problems and pro-social behaviour). All except the last are added to generate a total difficulties score. It is a measure which can be utilized for screening as well as a research tool. The tool has three versions, and for the purpose of the study, the SDQ (parent version) for 4 to 17 years was selected. The Nepali translation of the tool was taken from the official website. The reliability co-efficient of the parent version is 0.82 [22] and in the current study was found to be 0.8. Due to the lack of norms for the Nepali population, children with a total difficulties score of 13 and above were considered to fall in the group of high total difficulties.

Statistical analysis

The data was analyzed using Statistical Package for the Social Sciences (SPSS), Version 21. Descriptive statistics such as percentage, median and interquartile range were calculated. As the data lacked a normal distribution, non-parametric statistics such as Mann-Whitney U test and Kruskal-Wallis test were used to examine the differences in emotional and behavioural difficulties in terms of gender, level of exposure, socio-economic status and type of family. Finally, multiple linear regression was performed to identify significant predictor variables in the data.

Results

In the sample, 208 (45.8%) were boys, and 246 (54.2%) were girls. The study consisted of 220 students (48.5%) from public schools and 234 students (51.5%) from private schools.

(Table 1). The median(IQR) of the participants was 10(2) years. Table-1 provides a detailed description of the socio-demographic characteristics of the sample.

Table-1: Socio-demographic Characteristics of the Study Sample (N= 454)

Characteristics	Frequency (%)
Class	
Four	218 (48)
Five	236 (52)
Age	
8	26 (5.7)
9	88 (19.4)
10	182 (40.1)
11	97 (21.4)
12	38 (8.4)
13	17 (3.7)
14	6 (1.3)
Type of school	
Public	220 (48.5)
Private	234 (51.5)
Gender	
Boy	208 (45.8)
Girl	246 (54.2)
Religion	
Hinduism	346 (76.2)
Buddhism	81 (7.8)
Christianity	18 (4)
Islam	9 (2)
Ethnicity	
Chhetree	68 (15)
Brahman-Hill	67 (14.8)
Magar	32 (7)
Tamang	69 (15.2)
Newar	130 (28.6)
Musalman	8 (1.8)
Rai	8 (1.8)
Others	72 (15.9)
Socio-economic status	
Poverty group (Less than 19,261)	35 (7.7)
No poverty group (19,261 onwards)	257 (56.6)
Not mentioned	162 (35.7)
Type of family	
Nuclear	356 (78.4)
Joint	89 (19.6)
Divorced	7 (1.5)
Others	2 (0.4)
Father's education	

Illiterate	38 (8.4)
Literate	40 (8.8)
Below 10	103 (22.7)
SLC	91 (20)
Intermediate	61 (13.4)
Bachelors	53 (11.7)
Masters	26 (5.7)
Informal	1 (0.2)
Not stated	41 (9)
Mother's education	
Illiterate	73 (16.1)
Literate	45 (9.9)
Below 10	101 (22.2)
SLC	81 (17.8)
Intermediate	61 (13.4)
Bachelors	36 (7.9)
Masters	16 (3.5)
Not stated	41 (9)

The data from strengths and difficulties questionnaire showed that 149 (32.8%), 152(33.5%) and 153 (33.7%) children were in the high, average and low category of total difficulties score. A Spearman rank-order correlation was used to analyse the relationship between the level of exposure and the subscales of SDQ. A significant positive correlation was identified in total difficulties score (r=.078, $p < .05$) and peer problems (r=.079, $p < .05$) of the children (Table 2).

Table-2: Correlation Between Level of Exposure and Strengths & Difficulties Subscales

*Correlation is less than 0.05 level(1-tailed)
**Correlation is less than 0.01 level(1-tailed)

Measure	1	2	3	4	5	6	7
1.Level of exposure	-	.078*	.013	.068	.059	.079*	-.062
2.Total difficulties score	.078*	-	.742**	.724**	.771**	.609**	.314**
3.Emotional problems	.013	.742**	-	.372**	.402**	.291**	-.008
4.Conduct problems	.068	.724**	.372**	-	.473**	.327**	.322**
5.Hyperactivity	.059	.771**	.402**	.473**	-	.319**	.306**
6.Peer problems	.079*	.609**	.291**	.327**	.319**	-	.344**
7.Prosocial	-.062	.314**	-.008	-.322**	.306**	-.344**	-

Table-3 shows the bivariate analysis. The statistical analysis reveals that there were significant differences between boys and girls in terms of total difficulties score, conduct problems, hyperactivity-inattention, peer problems and prosocial behaviour ($p<0.05$) (Figure 2). In terms of socio-economic status, it was identified that emotional problems were greater for poverty group than for no poverty group ($p< .05$). No significant differences in the severity of exposure and type of family in relation to emotional and behavioural problems were identified in the study.

Table-3: Bivariate Analysis of SDQ TDS and Subscales

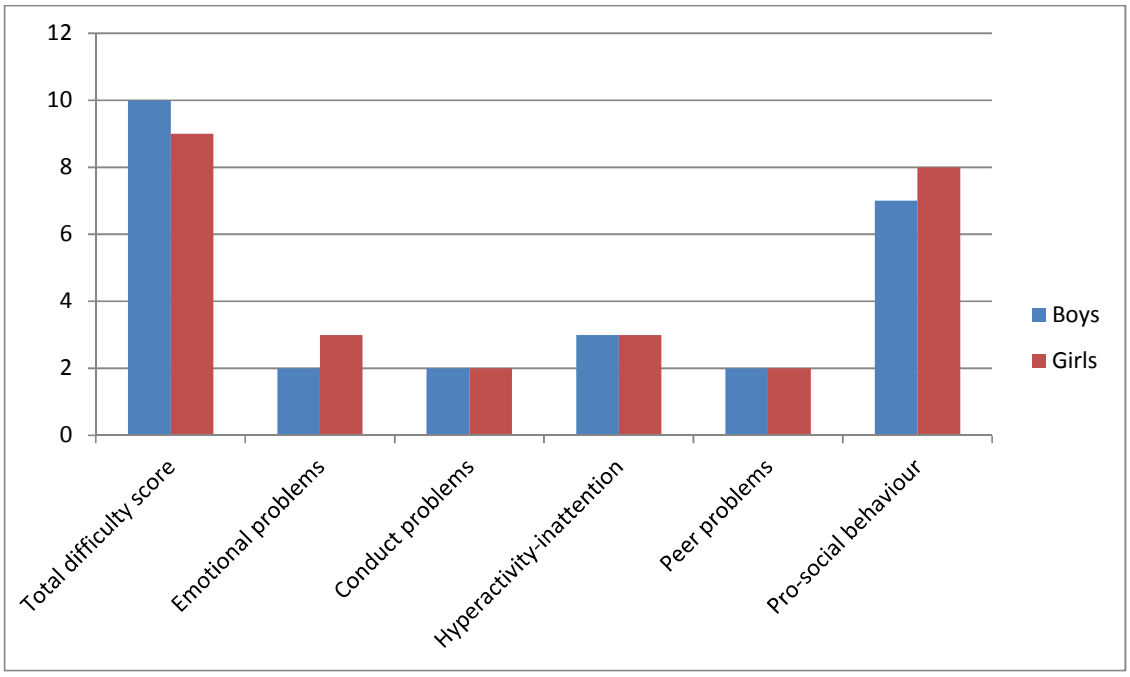
Characteristics	TDS		*p*	EPS		*p*	CPS		*p*	HAS		*p*	PPS		*p*	PSS		*p*
	Mdn	IQR		Mdn	IQR		Mdn	IQR		Mdn	IQR		Mdn	IQR		Mdn	IQR	
Gender			.01*			.75			.00*			.03*			.01*			.02*
Boy	10	8		2	4		2	3		3	3		2	2		7	3	
Girl	9	7		3	3		2	2		3	3		2	2		8	3	
Socio-economic status^			.30			.01*			.58			.25			.23			.48
Poverty group	11	9		4	3		2	2		2	3		2	3		8	3	
No poverty group	9	7		2	3		2	2		3	3		2	2		8	3	
Type of family			.85			.88			.54			.38			.27			.12
Nuclear	9	8		3	3		2	2		3	3		2	2		8	3	
Joint	9	8		2	3		2	3		3	2		2	2		8	3	
Divorced	9.5	14		3	4		2	2		2.5	6		1.5	4		6	6	
Others	-	-		-	-		-	-		-	-		-	-		-	-	
Level of exposure			.60			.97			.77			.49			.47			.54
Low	9	7		3	3		2	2		3	2		2	2		8	3	
Average	9	7		2	3		2	2		2	3		2	2		8	3	
High	10	7		3	3		2	2		3	3		2	2		8	3	

Notes. Mdn=Median; IQR=Interquartile range; TDS= Total difficulty score; EPS= Emotional problems; CPS= Conduct problems; HAS= Hyperactivity-inattention; PPS=Peer problems; PSS=Prosocial behaviour.

^Analysis was done on only 292 students due to missing data

*p <0.05

Figure-2: Bar graph depicting the median of boys and girls across the subscales of SDQ



Multiple linear regression was applied to predict conduct problems based on gender, socioeconomic status, type of family and severity of the exposure. The model explains 4.3% of variance in conduct problems. This is a "recommended minimum effect size representing a practically significant effect for social science data" [23]. The model presented in Table 4 also shows that both gender and severity of exposure were significant predictors of conduct problems, but gender is the better predictor of conduct problems (ß=-.16, $p<0.05$).

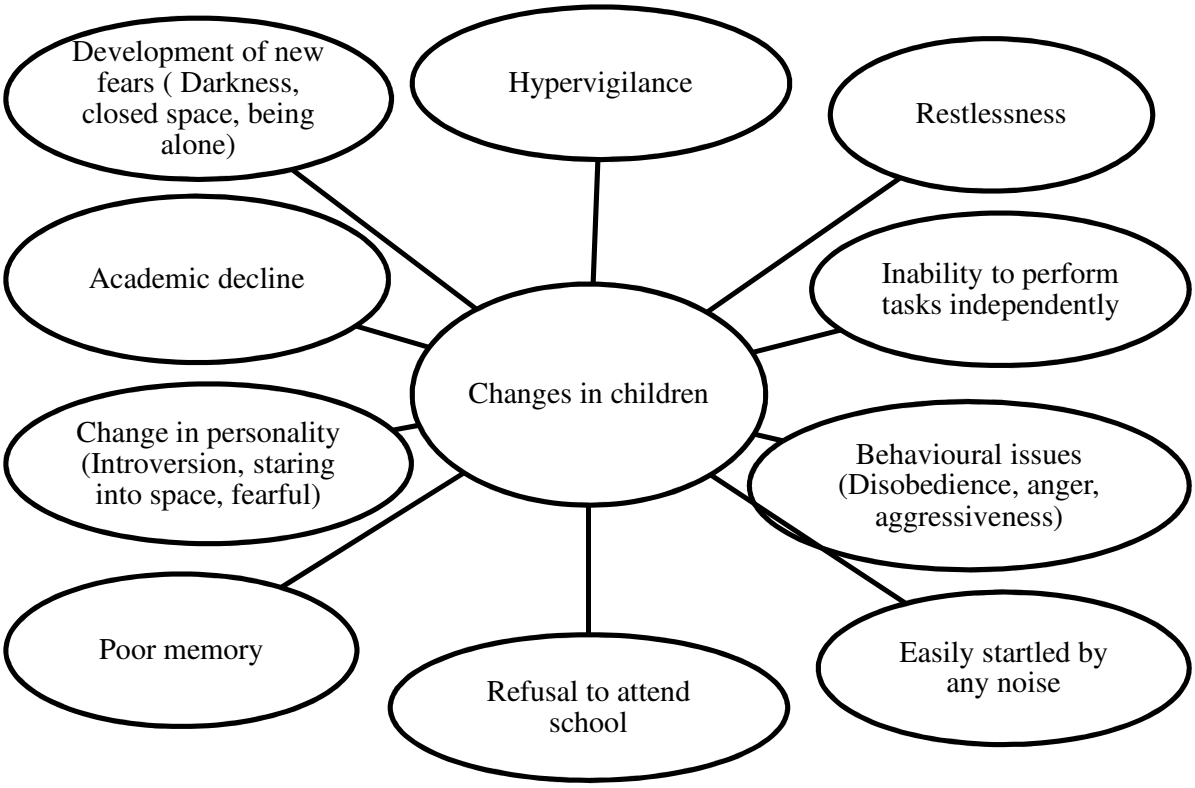
Table-4: Summary of the Multiple Regression Analyses (N=292)

Variable	TDS			EPS			CPS			HAS			PPS			PSS		
	B	SEB	β	B	SEB	β	B	SEB	β	B	SEB	β	B	SEB	β	B	SEB	β
Gender	-1.6	.68	-.14*	-1.8	.27	-.04	-.56	.20	-.16*	-.46	.26	-.11	-.41	.19	-.13*	.33	.25	.08
Socioeconomic status	-.86	1.04	-.05	-.96	.42	-.14*	.02	.31	.00	.38	.39	.06	-.29	.29	-.06	.18	.38	.03
Type of family	-.12	.76	-.01	-.02	.30	-.00	-.12	.23	-.03	.03	.29	.01	-.02	.22	-.01	-.11	.28	-.02
Total LOE	.07	.11	.04	-.02	.04	-.02	.07	.03	.12*	.02	.04	.03	-.01	.03	-.01	-.00	.04	.00
R^2	.024			.020			.043			.014			.020			.008		
F	1.80			1.50			3.26*			1.03			1.45			.57		

*p<0.05

The responses from the parents to the question about the changes observed in the children after the earthquake are illustrated in Figure 3.

Figure-3: Parental observation of the changes in the children after the earthquake



Discussion

We found that emotional problems exist among the children in Kathmandu even after three years of the earthquake. The sense of safety in children is threatened after a traumatic event. The sensitivity towards threat is heightened with repeated experience of stress triggering overwhelming arousal to even minor stimulus. Due to the inability to regulate their arousal, such children display behaviour such as irritability, aggressiveness, impulsivity, anxiety [12].In the sample, the children were exposed to recurring trauma, in the form of aftershocks,

which continue even till date. This experience could act as a reminder of the initial fear and helplessness, thereby sustaining the effects of original trauma in the children years after the earthquake [24].

Gender differences in emotional problems were identified in the study. The externalizing behaviours were found to be prominent in the boys while there was no such significant variation in terms of internalizing behaviours. The girls in the sample were found to be better at asking for help during difficulty, as demonstrated by the pro-social scale. In the study, information regarding the current behaviours of children was collected from parents. It has been found that parents are good at identifying the external behaviours, but children are a better source for collecting data about their internal emotional state [13]. The lack of differences in internalizing behaviours could be attributed to this weakness among parents to observe the changes in their children's emotions. Another possibility for this finding could be the differences in the way each gender responds to trauma. In Asian society, girls are socialized to hide their feelings as violence is a trait usually associated with masculinity. These societal norms could be an obstacle for the girls to show their discomfort and for the boys to seek social support when needed [25]. Resilience is an essential factor for recovery after trauma. A study conducted one year after the earthquake in Nepal identified high levels of resilience among Nepali children and adolescents [26]. It could be that the girls in this sample were more resilient as compared to the boys, which reduced the impacts of the trauma in this group. Trauma is a painful experience as it reminds individuals of their inner vulnerability. In Nepal, forgetting is a coping skill adopted by individuals to handle the loss and destruction due to the traumatic experience [27]. This cultural learning could have been internalized by the girls allowing them to cope better than the boys resulting in less emotional problems after the earthquake.

The level of exposure played a role in the emotional problems being faced by the children. The data shows as a categorical variable, the impact of exposure on children was not significant. However, when the level of exposure was treated as a continuous variable, high exposure to incidents such as death, injury, destruction etc. had an effect in the behaviours of the children. Other studies have adopted a similar method in exploring the effect of exposure on individuals following a trauma [28,29]. The details about deaths they had witnessed, injury among the friends and family, destruction in their surroundings etc. were collected from the children retrospectively. Though such details are difficult to forget, the weak relationship between exposure and emotional problems in the present study could be due to the poor recall among the children. Furthermore, children completed the exposure scale in their respective classrooms. Even though appropriate measures were taken to ensure that each child answered the form on their own, this group administration could have prevented the children from sharing their personal details in the forms. The responses of parents about the post-disaster changes observed in the children also provide support to the fact that the experience of earthquake created problems in personal, academic and social domains of the children.

In the study, socio-economic status was found to be significant only for emotional problems subscale. Despite the parents being informed that their data would be kept confidential, some of them chose not to reveal their income. Nevertheless, the data shows that those below the poverty line were at risk for emotional problems as lack of income is likely to expose children to additional stressors such as family conflict, worries about basic needs, poor access to healthcare etc. The type of family had no difference in the emotional problems in the sample. A possible explanation could be that some of the selected children currently were not living with their families due to personal issues. Further research is needed to see if a change in family dynamics could have affected their coping strategies towards trauma.

The present study showed the long term effects of disaster on children. Similar studies have found that individuals continued to show signs of depression, emotional problems, PTSD when assessed at time periods ranging from 2 to 25 years after the trauma [29-33]. Some studies have identified gender differences after an experience of the earthquake [16, 34-36] but other studies reported no significant variation in symptoms between the gender [28,33]. This shows that there are many constructs that influence the behaviours of boys and girls which need to be explored to understand the role of gender in trauma. Exposure is a variable that is strongly related to trauma as proven by studies which have shown that individuals who are directly exposed to the disaster show more trauma symptoms [35,37-38]. These studies point to the need to prioritize people who have higher experiences with trauma during the implementation of interventions. Socio-economic status measured in terms of income as in the present study was found to have differing results. While some studies reported, low income leads to more symptoms [39,40], a study in India did not find socio-economic status to have any influence on the adjustment of children [33]. As mentioned earlier, parents were not comfortable sharing details about their economic status and choosing other aspects such as material deprivation, and hardship would give a better idea of the complex relationship between socio-economic status and individuals [41]. With regard to the type of family, the researchers failed to identify studies incorporating this variable probably due to the multitude of factors that need to be considered when family dynamics are explored such as parental psychopathology, parenting style, parent-child relationships etc.

There are some limitations to the study. Though parents were asked to share information about past psychopathology or stressors in children, some parents did not answer this question. This could be due to the existing stigma towards mental health identified by previous studies on the status of mental health in Nepal [27,42]. Furthermore, this problem with lack of pre-trauma functioning is present in all disaster studies, and it is not possible to

conduct disaster research beforehand without knowing the impact of the event [13,43]. The study collected data about the children only from parents which could lead to parental bias. The observations of teachers could have provided further information about children but were not possible due to time constraints faced by the researchers as well as the teachers. There are multiple variables that can influence the reactions of individuals to trauma such as parental psychopathology, type of parenting, the resilience of children etc. which was not analyzed in the present study. Finally, to reduce heterogeneity in the sample, data was collected only from Kathmandu, which reduces the generalizability of the results to the entire population of Nepal.

Despite these limitations, the results of the present study contribute to the limited database on disaster studies among children from low-income countries. Children continue to face challenges after the earthquake, which highlights the need to develop suitable interventions to target these problems. Follow-up studies post-disaster have shown the effectiveness of treatments in reducing the impact of trauma [24,29]. Future researchers should focus on developing alternative evidence-based interventions for children and not be limited to medications which is the main mode of treatment in Nepal [44,45]. Considering the poor availability of resources to direct for mental health improvement in Nepal, it becomes necessary that clinicians start including parents in the treatment plan for children. The observations of parents in the study show that they are a reliable source for gathering information about the mental health of children. Children rely on their parents immediately after a disaster, and the parental reactions will influence the recovery of children. Teaching parents to identify the warning signals in children post-disaster, creating a safe environment, modelling healthy behaviours etc. could increase the resilience of children for future disasters [43,46-47]. This training programme can also be extended to teachers such that schools become a mediator between parents and mental health professionals.

The vulnerability of Nepal towards disasters also point to the need to conduct disaster preparedness training for the children. An awareness of the ways to protect themselves and their loved ones can provide a sense of control and reduce fear and worry faced by children in a threatening situation. Policymakers can address this gap in training which could help children deal with the aftershocks that occur periodically in Nepal. Further disaster studies are needed to chart the course of trauma in children in Nepal. Researchers need to utilise robust research designs and validated tools such that the data can be replicated and compared against future trauma studies. This could also contribute to the development of baseline data that overcomes the problem of pre-disaster information and allows clinicians to target the vulnerable groups, thereby ensuring the effective application of limited funds and skilled manpower. Finally, mental health professionals should team up with researchers to monitor the long-lasting effects of an earthquake to ensure those affected directly and indirectly receive support whenever the symptoms appear and allow individuals to deal with trauma memories at a pace that suits them.

To conclude, we found that the children in Kathmandu experience emotional problems as a result of the earthquake in 2015. The results of the study point to the role of gender, the severity of exposure, and lower socio-economic status in maintaining the emotional problems among the earthquake-affected children in Kathmandu. These risk factors need to be considered in the implementation of future interventions for children affected by the disaster. In a country with a poor mental health system, the study has pointed out areas which can contribute to the further development of mental health. The occurrence of natural disasters in Nepal is certain, but with suitable screening and treatment methods, we can avoid the lasting effects of trauma on the vulnerable groups of the population.

References

1. Government of Nepal, Ministry of Home Affairs. Disaster risk management in Nepal :

Status , achievements , challenges and ways forward. Kathmandu NP: Government of Nepal, 2017.

2. Aryal KR. Disaster vulnerability in Nepal. Int J Disaster Risk Reduct 2014, 9:137–146.
3. Acharya L, Upadhya KD, Kortmann F. Mental health and psychosocial support aspects in disaster preparedness: Nepal. Int Rev Psychiatry 2006, 18:587–592.
4. Government of Nepal, National Planning Commission. Post disaster needs assessment :Volume A. Kathmandu NP: Government of Nepal, 2015.
5. Government of Nepal. After the earthquake: Nepal's children speak out. Kathmandu NP: Government of Nepal, 2015.
6. Sherchan S, Samuel R, Marahatta K, Anwar N, Ommeren MHV, Ofrin R. Post-disaster mental health and psychosocial support: Experience from the 2015 Nepal earthquake. WHO South-East Asia J Public Health 2017, 6:22–29.
7. International Medical Corps, TPO Nepal. Exploring the mental health and psychosocial support needs and resources among earthquake-affected communities in Nepal. Kathmandu NP, 2015.
8. Kane JC, Luitel NP, Jordans MJD, Kohrt BA, Weissbecker I, Tol WA. Mental health and psychosocial problems in the aftermath of the Nepal earthquakes: Findings from a representative cluster sample survey. Epidemiol Psychiatr Sci 2018, 27:301–310.
9. Bicknell-Hentges L, Lynch JJ. Everything counselors and supervisors need to know about treating trauma. Paper presented at: American Counseling Association Annual Conference and Exposition; 2009 March; Charlotte, North Carolina.
10. Osofsky JD. Helping young children and families cope with trauma. Louisiana US: Louisiana State University Health Sciences Center.
11. Raabe FJ, Spengler D. Epigenetic risk factors in PTSD and depression. Front Psychiatry 2013, 4:80.
12. Bloom SL. Trauma theory abbreviated. Pennsylvania US, 1999.
13. Pfefferbaum B, North CS. Research with children exposed to disasters. Int J Methods Psychiatr Res 2008, 17:S49–56.
14. Frost JL. Lessons from disasters: Play, work, and the creative arts. Child Educ 2005, 82:2–8.
15. Sharma JR, Khatri R, Harper I. Understanding health research ethics in Nepal. Dev World Bioeth 2016, 16:140–147.
16. Bal A. Post-traumatic stress disorder in Turkish child and adolescent survivors three

years after the Marmara earthquake. Child Adolesc Ment Health 2008, 13:134–139.

17. Patel V, Flisher AJ, Nikapota A, Malhotra S. Promoting child and adolescent mental health in low and middle income countries. J Child Psychol Psychiatry 2008, 49:313–334.
18. Neria Y, Nandi A, Galea S. Post-traumatic stress disorder following disasters: A systematic review. Psychol Med 2008, 38:467–480.
19. Government of Nepal, Central Bureau of Statistics. Population monograph of Nepal (Volume II). Kathmandu NP: Government of Nepal, 2014.
20. Government of Nepal, Ministry of Education. Flash I report 2072 (2015-016). Kathmandu NP: Government of Nepal, 2015.
21. Erdur O. Psychological reactions of Turkish earthquake survivors (Doctoral disseration,University of Texas at Austin).
22. Goodman R. Psychometric properties of the strengths and difficulties questionnaire. J Am Acad Child Adolesc Psychiatry 2001, 40:1337–1345.
23. Ferguson CJ. An effect size primer: A guide for clinicians and researchers. Prof Psychol Res Pract 2009, 40:532–538.
24. Piccardi L, Palmiero M, Nori R, Baralla F, Cordellieri P, D'Amico S, et al. Persistence of traumatic symptoms after seven years: Evidence from young individuals exposed to the L'Aquila earthquake. J Loss Trauma 2017, 22:487–500.
25. Axinn WG, Ghimire DJ, Williams NE, Scott KM. Gender, traumatic events, and mental health disorders in a rural asian setting. J Health Soc Behav 2013, 54:444–461.
26. Schwind JS, Formby CB, Santangelo SL, Norman SA, Brown R, Hoffman Frances R, et al. Earthquake exposures and mental health outcomes in children and adolescents from Phulpingdanda village, Nepal: A cross-sectional study. Child Adolesc Psychiatry Ment Health 2018, 12:54.
27. Kohrt BA, Hruschka DJ. Nepali concepts of psychological trauma: The role of idioms of distress, ethnopsychology and ethnophysiology in alleviating suffering and preventing stigma. Cult Med Psychiatry 2010, 34:322–352.
28. Acharya S, Bhatta DN, Assannangkornchai S. Post-traumatic stress disorder symptoms among children of Kathmandu 1 Year after the 2015 earthquake in Nepal. Disaster Med Public Health Prep 2018, 12:486–492.
29. Goenjian AK, Steinberg AM, Walling D, Bishop S, Karayan I, Pynoos R. 25-year follow-up of treated and not-treated adolescents after the Spitak earthquake: Course and predictors of PTSD and depression. Psychol Med 2020, 1–13.

30. Piyasil V, Ketuman P, Plubrukarn R, Jotipanut V, Tanprasert S, Aowjinda S, et al. Post traumatic stress disorder in children after tsunami disaster in Thailand: 2 years follow-up. J Med Assoc Thail 2007, 90:2370–2376.
31. Piyasil V, Ketumarn P, Prubrukarn R, Ularntinon S, Sitdhiraksa N, Pithayaratsathien N, et al. Post-traumatic stress disorder in children after the tsunami disaster in Thailand: A 5-year follow-up. J Med Assoc Thail 2011, 94:138–144.
32. Irwanto, Faisal, Zulfa H. Posttraumatic stress disorder among Indonesian children 5 years after the Tsunami. Southeast Asian J Trop Med Public Health 2015, 46:918–923.
33. Kumar M, Fonagy P, Target M. Long term impact of disasters trauma on the psychosocial adjustment of children in Gujarat,India. Afr J Trauma Stress 2016, 5:29–37.
34. Erkan S. The effects of earthquakes on the behavioral and emotional problems of preschoolers. Soc Sci 2009, 4:347–354.
35. Ying L, Wu X, Lin C, Jiang L. Traumatic severity and trait resilience as predictors of posttraumatic stress disorder and depressive symptoms among adolescent survivors of the Wenchuan earthquake. PLoS One 2014, 9:e89401.
36. Xu J, Dai J, Rao R, Xie H. The association between exposure and psychological health in earthquake survivors from the Longmen Shan Fault area: The mediating effect of risk perception. BMC Public Health 2016, 16:417.
37. Kar N, Mohapatra PK, Nayak KC, Pattanaik P, Swain SP, Kar HC. Post-traumatic stress disorder in children and adolescents one year after a super-cyclone in Orissa, India: Exploring cross-cultural validity and vulnerability factors. BMC Psychiatry 2007, 7:8.
38. Derivois D, Cénat J-M, Mérisier GG. Multi-natural disasters in Gonaives Haiti: Long-term outcomes among child and adolescents and social support. Int J Emerg Ment Health 2014, 16:292-297.
39. Spell AW, Kelley M Lou, Wang J, Self-Brown S, Davidson KL, Pellegrin A, et al. The moderating effects of maternal psychopathology on children's adjustment post–hurricane Katrina. J Clin Child Adolesc Psychol 2008, 37:553–563.
40. Henderson SEK, Elsass P. Predictors of trauma and distress in Sri Lanka five years after the Indian Ocean tsunami: A cross-sectional study. Int J Disaster Risk Reduct 2015, 14:438–444.

41. Munsell EP, Kilmer RP, Vishnevsky T, Cook JR, Markley LM. Practical disadvantage, socioeconomic status, and psychological well-being within families of children with severe emotional disturbance. J Child Fam Stud 2016, 25:2832–2842.
42. Hall SE, Watson TS, Kellums ML, Kimmel J. Mental health needs and resources in Nepal. Int J Cult Ment Health 2016, 9:278–284.
43. Masten AS, Osofsky JD. Disasters and their impact on child development: Introduction to the special section. Child Dev 2010, 81:1029–1039.
44. Luitel NP, Jordans MJD, Adhikari A, Upadhaya N, Hanlon C, Lund C, et al. Mental health care in Nepal : Current situation and challenges for development of a district mental health care plan. Confl Health 2015, 9:3.
45. Regmi SK, Pokharel A, Ojha SP, Pradhan SN, Chapagain G. Nepal mental health country profile. Int Rev Psychiatry 2004, 16:142–149.
46. Bath H. The three pillars of trauma-informed care. Reclaiming Child Youth 2008, 17:17–21.
47. Schneider SJ, Grilli SF, Schneider JR. Evidence-based treatments for traumatized children and adolescents. Curr Psychiatry Rep 2013, 15:332.

Nishtha Shrestha, PhD Scholar; Dr. Baiju Gopal, PhD, Associate Professor, Department of Psychology, CHRIST (Deemed to be University), Bangalore.