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Original Research Article

Post-traumatic stress disorder among flood survivors of Kodagu subdistrict in Karnataka: a cross sectional study

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ABSTRACT

Background: Mental health being a major concern gradually rising from the shadows, post-traumatic stress disorder is triggering as a major public health issue followed by any disaster. Hence, we aimed to determine the prevalence of post-traumatic stress disorder and its associated factors among the flood survivors.
Methods: This cross-sectional study was conducted among the flood survivors who resided on the banks of river Kaveri and river Harangi in Somwarpet Taluk of Kodagu district, Karnataka, India. A semi structured questionnaire was administered by interview method to capture the data from 331 participants who were sheltered at the relief camps during the flood in the year 2019. Association of sociodemographic variables with PTSD was analyzed using the Chi-square test and Logistic regression.
Results: The mean (SD) age of the participants was 42.94 (±14.10) years and 141 (42.6%) were males. The prevalence of high severity symptoms of PTSD was 28.4%. Poor social support was perceived by 87.3% of the participants. Age, Loss of official documents, owning agricultural land and distance to river from the house were significantly associated with PTSD.
Conclusions: PTSD after the disaster was 28% in the population and the majority perceived poor social support. Post flood, employment of support programs and mindfulness programs are the needs of the hour.

Keywords: Post-traumatic stress disorder, Floods, Disasters, Survivors, Social support

INTRODUCTION

Flood is one among the natural disasters which is commonly seen across globe as a traumatic event which results in spectrum of mental and physical health consequences.[1] The after effect of flood showcase the substantial upshot on individual wellbeing, relationship and mental health.[2] Post-traumatic stress disorder is one such psychological disorder that can be seen sequelae to traumatic events.[3]

Post-traumatic stress disorder (PTSD) is a mental illness that develops as an effect of threatening, catastrophic situations and is characterized by cluster of symptoms of re-experiencing the traumatic event, avoidance of stimuli related to the event, hyperarousal and supressed cognition.[4,5] It is found that about eight million adults develop PTSD worldwide every year.[5] It is estimated that 15-25% of the victims who experience life threatening traumas develop and suffer from PTSD the estimate also showcases that the lifetime prevalence of PTSD among the population ranges 1% to 9%, as individuals who have developed chronic PTSD may take longer recovery time, that is more than 8 to 10 years after the event.[6,7] Available studies present that the symptoms of PTSD among flood survivors fluctuates from 8% to 80%, and factors supporting these symptoms encourages the incidence of PTSD.[8] Researches in United states have shown that of all men and women who experience traumatic events, 3-15% of the women and 1-6% of the men develop PTSD

as a post exposure effect.[9] PTSD can be developed after almost every distressing traumatic events. It is also found in many Indian settings after natural disasters like earthquake, cyclones, tsunami, flood and in numerous man-made disasters like community riots, terrorism, partner violence, road traffic accidents and including extreme physical diseases.[10,11] Most of the victims of the flood are afraid of the reoccurrence of flood damaging their livelihood and the after task requires massive time and money used to clean and repair their houses.[12] Perse, in Indian context, damage to the house and properties, physical injury to self or family member, and death of the family members are the factors that influence negative effect on the livelihood, fuelling to the risk of developing PTSD.[13] Kodagu is being affected by the heavy rainfall caused natural disasters like flood and landslide since 2018, while the focus on mental health of the survivors is compromised over physical health and financial crisis. Thus, the aim of this study was to determine the prevalence of PTSD among these flood survivors, and sub objective was to find the factors associated to PTSD.

METHODS

Study period and setting

A Community-based cross-sectional study was conducted at Somwarpet taluk of Kodagu district. Somwarpet Taluk is a majorly affected by the riverine flood every year after 2018 and the riverine flood prone areas on the banks of river Kaveri and river Harangi was selected, for the study.

Study participants and sampling

Multistage sampling technique was used to select 331 flood survivors of the year 2019. The list of relief camps set by the gram panchayats of Somwarpet taluk in the year 2019 was obtained from the panchayat offices. All the relief camps were selected and list of individuals rescued and relocated to the relief camps during the 2019 flood was retrieved. Lottery method was used to select the participants aged 18 and above from the sampling frame. Written informed consent from study participants was taken after explaining the purpose of the study. Individual identifiers were omitted to maintain the confidentiality.

Sample size determination

The sample size was determined using the single population proportion formula, by considering the prevalence of 26.9% from a study conducted in Tamil Nadu, with 5% absolute precision and 10% non-response rate, the calculated sample size for the study was 331.[14]

Data collection

Data were collected through the face-to-face interview on house-to-house visits, using semi structured questionnaire by the researcher who was aware of ethical principles such as anonymity, data management, securing informed consent of the participants.

Study variables

The outcome variable PTSD was measured using the 17 items of the PTSD checklist civilian version (PCL-C) (Cronbach's α=0.94). PTSD was measured dichotomously as present and absent. A total score of 45 and above was considered as PTSD present.[15] Independent variables include the sociodemographic variables (age, gender, income, marital status, type of house, occupational status), trauma related factors (exposure, rescue, damage to properties) and psychosocial factors like social support. Social support was measured using the Oslo 3 item scale, with its scores ranging from 3 to 14 with higher scores portraying strong social support and lower scores representing poor social support.[16]

Statistical analysis

Data was entered and analysed in the SPSS for windows V15. We computed descriptive, bivariate and multivariate logistic regression analysis to see the frequency distribution and to test the association between independent and dependent variables, respectively. Factors associated with PTSD were selected during the bivariate analysis with $p<0.05$ for further analysis in the multivariable logistic analysis.

RESULTS

A total of 331 participants participated in the study. The mean age of the participants was 42.94 years (SD±14.10 years) having the age range of 20-85 years. The majority of the participants 190 (57.4%) were female; 269 (81.3%) were married; 73 (22.1%) had attained high school level education; more than half (58.3%) were employed; The mean family monthly income was Rs. 23,746.22 (SD± Rs. 7,459.5) (Table 1). Among the participants, 291 (87.9%) of them were rescued during the disaster and rest were recused as precautionary measures. Among the 291 rescued during disaster, 253 had witnessed flood water above the floor level inside their houses; the mean duration of exposure to flood was 1.08 days (SD±0.62 days) and ranged from 1 to 5 days (Table 2). Damage to the house and household items was common among all the participants; 47 (14.8%) had damage to their jewels, 140 (42.3%) had their documents damaged; the mean of estimated cost of damage was Rs. 1,22,993.96 (SD± Rs. 67,856.12) and actual cost ranged from Rs. 20,000 to Rs 4,00,000. The mean distance to river from the house was found to be 379.91 meters (SD±255.3). The perceived social support among the participants observed to be 289 (87.3%) perceived poor social support and 42 (12.7%) had perceived moderate social support (Table 3).

Table 1: Distribution of the respondents according to the sociodemographic characters (n=331).

Variables	N	%
Age (years)		
20-34 (Youth)	108	32.6
35-49 (Early adults)	132	39.9
50-64 (Late adults)	51	15.4
≥65 (Elderly)	40	12.1
Gender		
Male	141	42.6
Female	190	57.4
Marital status		
Unmarried	31	9.4
Married	269	81.3
Widowed	28	8.5
Separated/divorced	3	0.8
Level of education		
Illiterate	55	16.6
Primary school	59	17.8
Middle school	60	18.1
High school	73	22.1
Intermediate/diploma	37	11.2
Graduate	39	11.8
Professional degree	8	2.4
Occupation		
Unemployed	138	41.7
Unskilled worker	114	34.4
Skilled worker	30	9.1
Shop/farmer	2	0.6
Semi-professional & Professional	47	14.2
Monthly family income: (INR)		
≤ 10,001	10	3
10,002-29,972	241	72.8
29,973-49,961	76	23
≥49,962	4	1.2
Agricultural land		
Own land	79	23.9

Table 2: Exposure to the flood and experience.

Variables	N	%
Type of rescue (n=331)		
Precautionary rescue	40	12.1
Rescued during disaster	291	87.9
Level of water (feet) (n=253)		
1 to 2	211	83.4
3 to 5	42	16.6
Days of exposure to flood (n=291)		
1	234	80.4
2	50	17.2
≥3	7	2.4

The prevalence of PTSD among the participants was found to be 28.4% (95% CI 23.6 to 33.5). In bivariate analysis, age, occupation, owning agricultural land, damage to crops and documents, distance to river were significantly associated ($p<0.05$).

Table 3: Perceived social support by the respondents (n=331).

Variables	N	%
Perceived social support		
Poor social support	289	87.3
Moderate social support	42	12.7

The odds of developing PTSD were 5.3 times higher among elderly compared with youth (AOR=5.3, 95% CI 2.1-13.0). Agricultural landowners were 2.6 times more likely to develop PTSD compared with non-owners (AOR=2.6, 95% CI 1.2-5.7). The likelihood developing PTSD were 2.4 times higher among participants who had their documents damaged when compared with those had their documents safe (AOR=2.4, 95% CI 1.3-4.3). The odds of developing PTSD were 6.9 times higher among the participants who had their houses at more than 700 meters from river compared with those who had their houses less at less than 101 meters (AOR=6.9, 95% CI 2.5-18.7) (Table 4).

DISCUSSION

Symptoms of PTSD usually onsets before 3 months in adults. However, there are times that delay symptoms by months or even by years in some people, this might be because some people show up minimal symptoms at the beginning and then experience crisis which fuels the symptoms.[17] Most of the sample have had negative impact by the flood in their various aspects of life such as housing, income, family etc. Many samples met the criteria of having at least one symptom of PTSD, among all the event experienced individuals 28.4% of them showcased of having PTSD symptoms according to the PCL-C scale. This finding was consistent with the other studies on people with PTSD and experience of Natural disasters, such as 27.4% in Tehri and 23.7% in Pauri, 25.1% in Wuhu.[18,19] On the other hand, the finding was less than 37.3% among landslide victims in Koshe, 51.3% in Tamil Nadu.[5,20] Contrary, it was more than 22% in Kerala, 19.8% in Uttarakashi, 18.5% among earthquake victims in Nepal.[18,21,22] The conceivable explanations for these differences can be administration of dissimilar instruments, cut off points, other study designs and magnitude of the trauma in the studies, cultural context and socioeconomic status versus negative consequences of the disastrous event.[5,23] Age, Loss to documents, owning agricultural land and distance to river from the house were significantly associated with PTSD. The higher likelihood of developing PTSD as the age increases from our study was consistent with findings from other studies.[20,21,24-26] This can be for the reason that elderly group already prone to have decreased quality of life in terms of physical health and psychosocial well-being, as a result they have less effective emotion cope up actions taken, less social interactions and support after the disaster.[25,27,28]

Table 4: Factors associated with PTSD (n=331).

Variables	Categories	PTSD N (%)		AOR (95% CI)
		Yes (%)	No (%)	
Age (years)	>64 (elderly)	23 (57.5)	17 (42.5)	5.3 (2.1-13.0)
	50-64 (late adults)	24 (47.1)	27 (52.9)	3.5 (1.5-7.9)
	35-49 (early adults)	27 (20.5)	105 (79.5)	1.1 (0.5-2.3)
	20-34 (youth)	20 (18.5)	88 (81.5)	1
Own agricultural land	Yes	12(15.2)	67 (84.8)	2.6 (1.2-5.7)
	No	82 (32.5)	170 (67.5)	1
Damage to documents	Yes	53 (37.9)	87 (62.1)	2.4 (1.3-4.3)
	No	41 (21.5)	150 (78.5)	1
Distance to river	>700	19 (61.3)	12 (38.7)	6.9 (2.5-18.7)
	401-700	33 (29.5)	79 (70.5)	2.8 (1.3-6.1)
	101-400	23 (22.8)	78 (77.2)	2.3 (1.0-5.3)
	<101	19 (21.8)	68 (78.2)	1

The odds of developing PTSD among participants who had their documents damaged were 2.4 times higher when compared with those had their documents safe. This can be because of the loss the documents containing the valuable assets may sometimes lead to loss of some assets and damage to educational records contribute to the additional cost to bear along with the other major repair costs. Owning an agricultural land in the flooded area was another factor which enhances the development of PTSD by 2.6 times in comparison with individuals with no agricultural land in the flooded region. This might be due to the flood induced agricultural losses like damage to crops contributing to the financial losses and also can be because of the participant having intimate engagement in agriculture and responsibility of family finance from the agriculture leading to more stress.[29,30] The closer the distance to disaster area, higher the stress is been reported by many other studies.[31,32] On the contrary, our study findings are that participants who had their houses situated farther from the river had 6.9 times more likelihood of developing PTSD than the participants lived near to the river. This can be because of the habituated mindset of the individuals living closer to the river and individual living distant from the river have lesser chance of experience to flood earlier. This threat and fear for damage to belongings and health precipitates the onset of PTSD.

Limitations

The cross-sectional study design prevents us from establishing the temporal relationship with the associated factors found. There are chances for self-reporting bias and recall bias as the participants might not have confronted the presence of other mental illness which can confound the outcome or exposure to other traumas which might have influenced the development of PTSD.

CONCLUSION

PTSD after the disaster was 28% in the population and the majority perceived poor social support. Post flood, Capacity building efforts such as home rebuilding efforts, economic aid is not just the need of the survivors but also the employment support programs and mindfulness programs that will provide benefit by addressing the ongoing disaster-related adverse circumstances shown here to be associated with PTSD.

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