Pak J Med Res
Vol. 55, No. 1, 2016

Original Article

Stress, Anxiety, Depression, and Posttraumatic Stress Disorder among General Population Affected by Floods in Pakistan

Naeem Aslam, Anila Kamal
National Institute of Psychology, Quaid-i-Azam University, Islamabad.

Received: 26 November 2014, **Accepted:** 18 March 2015, **Published:** 21 March 2016

Abstract

Background: Natural disasters evoke certain distressful traumatic reactions which impede the lives of the survivors. The flood in July 2010 were one of the Pakistan's largest natural disasters.
Objectives: To determine the prevalence of stress, anxiety, depression and posttraumatic stress disorder among adults exposed to 2010 floods in Pakistan.
Study type, settings and duration: Cross sectional study done in flood affected areas of Pakistan. Data was collected from February 2013 to May 2013.
Subjects and Methods: Sample of the study comprised of 2000 individuals. The data was collected from highly flood affected areas like Mianwali, Muzafar Garh, and Dera Ghazi Khan from Punjab, Nowshera and Peshawar from Kyber Pukhtunkhwa and Neelum Valley form Azad Jammu Kashmir. Data was collected by using convenient sampling technique. Stress, Anxiety and depression were measured by using Depression, Anxiety and Stress Scale. Posttraumatic stress disorder was assessed using the self-report measure, Impact of Event Scale.
Results: Age range of the participants was between 15 to 65 years (*Mean* 28.7, *SD* = 7.1), for both genders. After about three years of floods, posttraumatic stress disorder was still present in both genders. However, it was higher among females and unemployed individuals. Moreover, higher exposure to flood was positively associated with posttraumatic stress disorder whereas, age, and education were negatively related with distress and posttraumatic stress disorder.
Conclusion: Psychological disorders persists for several years after the disaster and results in significant personal distress.
Policy message: The association between psychological distress, gender, age, education and employment status has to be taken into consideration when mental health policies for flood-survivors are planned at the national level.
Key words: Stress, anxiety, depression, posttraumatic stress disorder, prevalence, flood affectees.

Introduction

The 2010 flood in Pakistan not only brought extensive destruction to the affected areas, but also left the survivors with mental disorders especially, Posttraumatic Stress Disorder (PTSD) and other mental health problems. The physical devastation of the flood to the homes and infrastructure of one-fifth area of Pakistan was reported[1]. However, there is scarcity of the research on psychological and emotional maladies suffered by thousands of residents affected by floods. Trauma studies have shown that after exposure to disaster, psychological problems like stress, anxiety, depression, and PTSD become more frequent[2]. However, PTSD is the most severe type of illness that impairs the person's daily life functions with lifetime estimates of 7 to 12% [3]. The prevalence of PTSD from disaster varies from 11-32% [4]. A study reported that after 2.5 years of Tsunami, the incidence of PTSD and major depressive disorder was 36.5% and 28.6%, respectively followed by specific phobia (30.2%), agoraphobia (17.5%), and social anxiety disorder (11.1%) and women had a higher prevalence of specific phobia than men (45.5% vs. 13.3%) [5]. The prevalence of PTSD, depression, and co-morbid psychological conditions after the Tsunami were 33.6% 14.3% and 11.3% respectively[6]. In another study, following 2008 earthquake in Kashmir, there was high prevalence of stress, anxiety, depression, and PTSD among those who were affected and exposed to the earthquake as compared to those individuals who were not affected[7]. In an earthquake in China, the prevalence of acute stress disorder (ASD) and PTSD was 15% and 29%, respectively[8].

Traumatic responses after exposure to a disaster may go for years. However, it varies across population

Corresponding Author:
Naeem Aslam
National Institute of Psychology
Quaid-i-Azam University, Islamabad.
Email: naeemaslam@nip.edu.pk

and nature of disaster. In a study, 6 months after exposure to Wenchuan earthquake in China, the prevalence of PTSD was 15.57% in the survivors with old age, female gender, living alone, and serious injuries as the major risk factors[9]. Similarly after exposure to Hurricane, lower education, greater severity of trauma and greater number of traumatic and stressful life events, particularly financial problems, were found associated with chronic PTSD[10]. After Chile earthquake, researchers found that posttraumatic stress symptoms were dramatically but unevenly elevated among residents of strongly shaken areas. The higher was the level of exposure more were the symptoms[11]. Females showed higher level of distress as compared to males and females with high disaster exposure had higher risks of PTSD[12].

In the present study, we aimed to see the prevalence of distress responses and PTSD among flood-affected individuals and see the relationship of demographic variables such as age, gender, education and socioeconomic status and nature of losses with the psychopathology in individuals who had experienced severe exposure to a natural disaster[1].

Subjects and Methods

This cross sectional study was done on individuals who had been exposed to the 2010 floods in Pakistan. Data was collected from February 2013 to May 2013. Sample comprised of 2000 flood affected individuals of both genders who were selected using convenient sampling technique. The data was collected from the different highly flood affected areas of Pakistan including Mianwali, Muzafar Garh, and Dera Ghazi Khan from Punjab, Nowshera and Peshawar from Kyber Pukhtunkhwa and Neelum Valley form AJK. Only those individuals were taken who had experienced the flood and who had no history of suffering from psychiatric illness in the past or present and who could comprehend and understand the questionnaires.

Urdu translated versions of depression, anxiety and stress scale (DASS) [13] and Impact of event scale (IES) [14] were used to assess the stress, anxiety, depression and PTSD respectively. Alpha reliability of the DASS for the current sample was .93 and for IES was .89. Confirmatory factor analysis (CFA) was done using AMOS. The validity indices such as incremental fit index (IFI), normed fit index (NFI) and comparative fit index (CFI) of both scales were in acceptable range. For the data collection, the respondents were approached individually. All individuals were explained the purpose of the study and they were assured that the information collected would remain confidential and would be used only for the research purpose.

Data was analyzed by using Predictive Analytics Software (PASW 18). Descriptive statistics, Chi square analysis, independent sample t-test and ANOVA were used for analyses.

Informed consent was taken from all subjects and for children less than 18 years, the consent was taken from parents or caregivers.

Results

A total of 2000 participants of both gender completed the questionnaire and their data was analyzed. Their ages ranged from 15 to 65 years with a mean of 28.7 years. (*SD* = 7.1).

Table 1: Prevalence of stress, anxiety, depression and PTSD among men and women affected in flood (n=1953).

Level of Stress	*Valid n (1954)*	*Males (n=1364) n(%)*	*Females (n=589) n(%)*	*χ^2*	*p*
Normal stress		687(50.4)	252(42.8)	15.26	.004
Mild stress		215(15.8)	87(14.8)		
Moderate stress		238(17.4)	131(22.2)		
Severe stress		181(13.3)	89(15.1)		
Extremely severe stress		43(3.2)	30(5.1)		
Levels of anxiety	*(n=1962)*	*Males (n=1370)*	*Females (n=592)*	*χ^2*	*p*
Normal anxiety		524(38.2)	197(33.3)	8.23	.08
Mild anxiety		102(7.4)	44(7.4)		
Moderate anxiety		263(19.2)	140(23.6)		
Severe anxiety		151(11.0)	76(12.8)		
Extremely severe		330(24.1)	135(22.8)		
Levels of depression	*(n=1963)*	*Males (n=1371)*	*Females (n=591)*	*χ^2*	*p*
Normal depression		523(38.1)	186(31.5)	15.10	.004
Mild depression		198 (14.4)	122(20.6)		
Moderate depression		339(24.7)	151(25.5)		
Severe depression		183(13.3)	75(12.7)		
Extremely severe		128(9.3)	57(9.6)		
PTSD levels	*(n=1933)*	*Males (n=1348)*	*Females (n=585)*	*χ^2*	*p*
Subclinical range		125(9.3)	27(4.6)	16.52**	.001
Mild range		337(25.0)	142(24.3)		
Moderate range		493(36.6)	209(35.7)		
Severe range		393(29.2)	207(35.4)		

Table 2: Differences on distress responses and PTSD among employed and unemployed individuals (n = 1622).

	Employed (n=700)		*Unemployed (n=922)*		*t* (1620)	*p*	*95% CI*		
Variables	*M*	*SD*	*M*	*SD*			*Lower*	*Upper*	*Cohn's d*
DASS	18.51	11.91	22.91	12.69	7.65	.001	-5.52	-3.27	.36
Stress	7.45	4.25	8.81	4.37	6.74	.001	-1.75	-0.96	.31
Anxiety	5.22	4.35	6.56	4.70	6.31	.001	-1.75	-0.92	.29
Depression	5.88	4.38	7.53	4.77	7.71	.001	-2.07	-1.23	.36
PTSD	30.11	16.33	37.08	17.50	8.75	.001	-8.54	-5.41	.41

Table-1 shows that both genders had stress, however, moderate, severe and extremely severe stress was significantly higher in females as compared to males ($p < .01$). Females showed higher depression as compared to males (9.6% females had extreme severe depression as compared to 9.3% in males). For severe PTSD significant difference was seen between females (35.4%) and males (29.2%). However, values for anxiety were not significant.

Table-2 demonstrates the differences between currently employed and unemployed individuals. Results showed that unemployed individuals were psychologically more disadvantaged as compared to employed individuals. Unemployed individuals scored high in stress, anxiety, depression and PTSD.

Table-3 shows that adolescents between 16 to 20 years were highly affected whereas, least affected were the old age group. Posthoc analysis (Bonferroni) highlighted that adolescents showed more pathology as compared to adults and older adults.

Table-4 illustrates that age, year of education and years of marriage had negative relationship with stress, anxiety, depression, and PTSD.

Discussion

Present study showed that 3 years after their exposure to 2010 flood in Pakistan, population affected and exposed had stress, anxiety, depression, and PTSD. These findings are consistent with previous studies in which prevalence of PTSD and psychological distress was higher among disaster-exposed population as compared to those who did not experience the disaster[7]. In another study level of psychological distress among nurses showed high to moderate levels of psychological distress and 66.7% had significant post-traumatic symptoms[15].

In the present study, females scored high on most variables and this could be due to the fact that female ruminate more than males. Brooding rumination involves a passive consideration of current conditions, and it is associated with higher levels of depression. In a community sample, female adolescents were reported to be engaged in more brooding/intrusive rumination than male adolescents and a positive relationship was seen between brooding rumination to depressive symptoms[16]. Moreover, It can also be noted that the mere exposure to stressful situation is not sufficient cause rather the subjective appraisal is also important[17]. Female gender appraise the traumatic events more and think over it repeatedly[18].

Greater number of traumatic and stressful life events, particularly financial problems are associated

Table 3: Age wise comparison of the distress responses (n = 1715).

	Below 20 Years (279)		*20-40 Years (1255)*		*41-65 Years (181)*				
Variables	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*	*Post hoc*
Stress	9.39	4.20	8.20	4.43	7.09	3.84	16.21	.00	1>2,3;2>3
Anxiety	7.28	4.53	5.93	4.65	4.97	4.32	15.37	.00	1>2,3;2>3
Depression	8.15	4.76	6.82	4.72	5.45	4.42	18.64	.00	1>2,3;2>3
PTSD	38.04	16.76	33.80	17.60	31.78	18.11	8.75	.00	1>2,3

df = 2, 1712

Table 4: Relationship of demographic variables with the stress, anxiety, depression and PTSD.

Variables	*1*	*2*	*3*	*4*	*5*	*6*	*7*
Age	-						
Years of education	.13**	-					
Years of marriage	.84**	-.17**	-				
Stress	-.14**	-.11**	-.04	-			
Anxiety	-.13**	-.12**	-.04	.74**	-		
Depression	-.14**	-.12**	-.05	.77**	.80**	-	
PTSD	-.10**	-.25**	.02	.55**	.46**	.50**	-

**p <.01

with a delayed-onset trajectory. These findings suggest the importance of prevention efforts designed to mitigate the deleterious effects of post-disaster stress factors, most notably financial distress[9]. Identifying the risk and protective factors for the distress and psychopathology among the affected population, studies showed that financial problems after the disaster is a risk whereas social support serves as a protective factor. In youth Hurricane and community violence study, financial problems were the risk factors, while peer social support served as a protective factor for these youth. Risk factors help people to identify the potential victims after disasters[19]. Identification of these factors suggests directions for future research as well as potential target areas for screening and intervention with disaster-exposed population[20]. Post-disaster mental health recovery interventions are needed which include early identification, sustained psychosocial, social and economic support[8].

The convenience sample limits the external validity of the findings to other disaster-exposed population, and the self-report data is susceptible to response bias. Moreover, we relied solely on self-reports of survivors, which were often subject to recall biases. It should be noted that we do not have the pre-disaster psychological distress level, history of any other trauma exposure, family history of psychopathology, and/or psychosocial support they receive after the flood and so on and thus potentially limiting the generalizability of these results. It is also possible that more severely affected survivors were still in hospitals or shelters, and some might have been relocated to other places. Some might have received the psychosocial interventions. Hence, the study might undermine impact of the flood.

Authors Contribution

NA proposed the idea for this project, finalized the methodology and involved in data collection and AK provided guidance in statistical analysis and manuscript preparation.

Conflict of interest: This Research is a part of the funded project of Higher Education Commission (HEC) to the authors, under the thematic Research Grant Program (Phase-11).

References

1. National disaster Management Authority Report 2010. (Accessed on 7th March, 2016) Available from URL: http://ndma.gov.pk/Documents/Annual%20Report/NDMA%20Annual%20Report%202010.pdf
2. Kessler RC. Posttraumatic stress disorder: The burden to the individual and to society. The J Clin Clinical Psychiat 2000;61:4–12.
3. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters, EE. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. Arch Gen Psychiat 2005;62:593–602.
4. Kar N, Bastia BK. Post-traumatic stress disorder, depression and generalised anxiety disorder in adolescents after a natural disaster: a study of comorbidity. Clin Pract Epidemol Ment Health 2006;2:17-23.
5. Hussain A. Weisaeth L. Heir T. Psychiatric disorders and functional impairment among disaster victims after exposure to a natural disaster: A population based study, J of Affect Disorders 2011;128:135–41.
6. Thavichachart N, Tangwongchai S, Worakul P, Kanchanatawan B, Suppapitiporn S, Pattalung AS et al. Posttraumatic Stress Disorder of the Tsunami Survivors in Thailand. J Med Assoc Thai 2009;92(3):420-9.
7. Aslam N. Tariq N. Trauma, depression, anxiety and stress among earthquake affected and non-affected individuals. Pak J Psychol Res 2010;25(2):13-48.
8. Yuan KC. Ruo YZ, Zhen YS. Xu DZ. Jian ZY. Edwards JG et al. Prevalence and predictors of stress disorders following two earthquakes. Int J Soc Psychiat 2013;59(6):525-30.
9. Zhou X. Kang L. Sun X. Song H. Mao W. Huang X et al. Prevalence and risk factors of post-traumatic stress disorder among adult survivors six months after the Wenchuan earthquake. Compr Psychiat 2013;54(5):493-9.
10. Pietrzak RH. Van Ness PH. Fried TR. Galea S. Norris FH. Trajectories of posttraumatic stress symptomatology in older persons affected by a large-magnitude disaster. J Psychiatr Res 2013;47(4):520-6.
11. Zubizarreta JR. Cerda M. Rosenbaum PR. Effect of the 2010 Chilean earthquake on posttraumatic stress: reducing sensitivity to unmeasured bias through study design. Epidemiol 2013;24(1):79-87.
12. Zhen Y, Huang ZQ, Jin J, Deng XY, Zhang LP, Wang JG. Posttraumatic stress disorder of Red Cross nurses in the aftermath of the 2008 Wenchuan China Earthquake. Arch Psychiatr Nurs 2012;26(1):63-70.
13. Lovibond SH, Lovibond PF. Manual for the Depression Anxiety Stress Scales. 2nd. Ed. Sydney: Psychology Foundation; 1995.
14. Weiss D, Marmar C. The Impact of Event Scale -Revised. In: Wilson J, Keane T, editors. Assessing psychological trauma and PTSD. New York: Guilford; 1997. pp. 219–38.
15. Qu Z, Wang X, Tian D, Zhao Y, Zhang Q, He H et al. Posttraumatic stress disorder and depression among new mothers at 8 months later of the 2008 Sichuan earthquake in China. Arch Womens Ment Health 2012;15(1):49-55.
16. Jose PE, Weir KF. How is Anxiety Involved in the longitudinal relationship between brooding rumination and depressive symptoms in adolescents? J Youth Adolesc 2013;42(8):1210-22.
17. C'De Baca J, Castillo D, Qualls C. Ethnic differences in symptoms among female veterans diagnosed with PTSD. J Trauma Stress 2012;25(3):353-7.
18. Aslam N, Kamal A. Frequency of posttraumatic stress disorder (PTSD) among flood affected individuals. Pak Armed Forces Med J 2014;64(1):100-4.
19. Self-Brown S, Lai BS, Thompson JE, McGill T, Kelley ML. Posttraumatic stress disorder symptom trajectories in Hurricane Katrina affected youth. J Affect Disord 2013;147(1-3):198-204.
20. Galovski TE, Blain LM, Chappuis C, Fletcher T. Sex differences in recovery from PTSD in male and female interpersonal assault survivors. *Behav Res Ther* 2013;51(6):247-55.