

Prevalence of post-traumatic stress (PTSD) and depression among flood victims

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ABSTRACT

The concept of disaster implies community as the basis and defines it as “an event, concentrated in time and space in which a society, or a relatively self-sufficient subdivision of a society, undergoes severe danger and incurs...losses to its members and physical appurtenances.” Flooding has various impacts on the affected population in terms of damage to property, destruction of property and loss of life. Flood disaster creates sufferings, pain and agony among the victims. Depression is not the same as a blue mood, which is a normal short-term experience of sadness or loss. Depression is an illness that involves the body, mood, and thoughts. Often referred to as the invisible disease, it affects the way a person eats and sleeps, the way one feels about oneself, and the way one thinks about things. Our findings reveal that flood do not affect people equally. There is a high degree of heterogeneity in the size – but not much in the direction – of the impacts on different socioeconomic groups. Inequalities in risk exposure and sensitivity to risk and in access to resources, opportunities and capabilities, put specific segments of the population in a disadvantaged position. Identifying general patterns in the magnitude of the impacts is not easy due to the intensity of flood and the complexity of the interactions triggered by them.

Keywords: PTSD, Flood Victims, Disaster

Disaster can be a frustrating and multifaceted task that proves difficult even for scholars (Cutter, 2005a). However, by specifying a particular purpose and audience one can usually negate most of these issues. The essential part of a definition lies in its context, which must clarify the goals of the definition as well as its utilization. Most modern definitions of disasters refer to “high-magnitude stressful life events” (Baum, 1987; Freedy et al., 1992) or “Environmental stressors that happen to a community” (Green & Solomon, 1995).

“Disasters are non-routine events in societies or their larger subsystems (e.g. regions, communities) that involve conjunctions of physical conditions with social definitions of human harm and social disruption” (Kreps, 2001). Fritz (1961) recognizes that the concept

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of disaster implies community as the basis and defines it as “an event, concentrated in time and space in which a society, or a relatively self-sufficient subdivision of a society, undergoes severe danger and incurs...losses to its members and physical appurtenances.” Susman, Okeefe, and Wisner (1983a) elaborate a view of disaster in which “physical agents define the problem”. Moreover, Hewitt (1983a) stressing the unexpected and unprecedented aspects of the disaster observed that they “derive from natural processes of events”. Different experts view disasters as social catalysts that relate to community and societal adaptations before, during, and after they occur (Birkland, 1997; Dubin, 1978; Kreps, 1998; Kreps & Drabek, 1996).

Disasters are of many kinds, natural disasters triggered by climatic or geophysical changes like earthquakes, fires, dam collapse, floods, volcanic eruptions, hurricanes, tsunamis, and disasters due to human initiated events like war, technological events, and terrorism. To study conditions of physical and social vulnerability, the risks associated with these situations, and efforts to alleviate these conditions before they become disastrous should be important. Focusing on actual events to study disaster preparedness, emergency response, and long-term recovery as well as comparing adaptations to a broad range of natural, technological, or wilful events is necessary (Cutter, 2001, 2003a; Tierney, Lindell, & Perry, 2001).

In recent years, a noteworthy attention to health security has been observed worldwide. Improved wellbeing that reduces the effects of environmental disasters also provides an opportunity to understand health in the context of disaster vulnerability. Painful changes and disruptions to one’s life provide valuable insight into the psychological effects on the victims. Acquiring information about disaster survivors provide valuable insight into the psychological effects resulting from painfully drastic changes and disruptions to one’s life. This insight can provide researchers with a strong basis on which to investigate the long-term influence of the social changes that are evoked after a natural disaster. Social relationships are fundamental in a way that threats to them can be perceived as threats to survival. (MacDonald, Kingsbury, & Shaw 2005; Macdonald & Leary, 2005; Panksepp, 2004).

Furthermore, disaster survivors provide a useful research sample in the way that after disasters they often temporarily live in shelters giving them more free time available to take part in scientific research, until relief efforts are provided, than they would normally have in their daily schedule. Studies examining the dynamics of families facing stressful life events are unique chances provided to the researchers when families are living in shelters. Besides, this research will have a more valid and reliable sample than if only isolated individuals were studied. Researchers can identify variables that may shield against the persisting harmful pressures of collective pain due to distressing events. Moreover, one can also look at differences that exist among individuals and groups in their capacity to cope with such events, traumatic experiences which can affect one’s psychological health overtime can also be explored. Finally, cyclic changes on climate patterns also have a large association with the increased number of natural hazards over the last 15 years. Since the 1950.s in both developed and developing countries population densities in cities and in geophysical vulnerable areas have increased, in both developed and developing countries, dramatically since 1950. According to Noji, 2005, the majority of the world’s largest cities (17 of 20) are in developing countries, 80% of the world’s population will be concentrated in developing countries by 2025, and half of the large cities in the developing world are vulnerable to natural disasters such as floods, severe storms, and earthquakes. In developing countries like

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Pakistan disaster-related health problems are higher because of poor nutritional position and lower immunization rates, including a greater shortage of the facilities that provide clean water and hygiene.

REVIEW OF LITERATURE

Flooding has various impacts on the affected population in terms of damage to property, destruction of property and loss of life. Flood disaster creates sufferings, pain and agony among the victims.

Depression is not the same as a blue mood, which is a normal short-term experience of sadness or loss. Depression is an illness that involves the body, mood, and thoughts. Often referred to as the invisible disease, it affects the way a person eats and sleeps, the way one feels about oneself, and the way one thinks about things. Depression is not a sign of weakness or a condition that can be willed or wished away. People who are depressed cannot merely “pull themselves together” and get better. Without treatment, symptoms can last for weeks, months, or years. Appropriate treatment, however, can help most people who suffer from depression (Stuart, 2004 and Horwitz, 2010).

Stress and anxiety experienced by the victims can finally create the symptoms of depression. According to Beck (Beck, 1967), depression is due to the attitude and mindset of private individuals and the symptoms showing signs of depression are a result of non-peaceful thoughts. Those who are depressed are more likely to perceive their future experience as an understanding of the personal and impersonal factors. Cognitive structure between the input stimulus and response personality of the beliefs and assumptions relate to an object, event or environment. They also consider the future of their experience as negative and unrealistic. Depressed attitude is likely to be long-lasting and permanent if not controlled. They are also in a state of worry and concern. This theory describes the three-negative thinking: man, of himself, the world and the future as he thinks. Negative thoughts of one are how individuals will see themselves in a negative frame of thought; thinking of one as inadequate and worthless. This condition will cause the individual to express him or herself physically, mentally, and morally, and will further push him or herself out of any activity.

After exposure to severe trauma, either an earthquake or violence, adults are at high risk of developing severe and chronic posttraumatic stress reactions that are associated with chronic anxiety and depressive reactions (Armen K. Goenjian, Alan M. Steinberg, Louis M. Najarian, Lynn A. Fairbanks, Madeline Tashjian and Robert S. Pynoos, 2000).

Depression is an illness that involves the body, mood, and thoughts. Often referred to as the invisible disease, it affects the way a person eats and sleeps, the way one feels about oneself, and the way one thinks about things. Depression is not a sign of weakness or a condition that can be willed or wished away. People who are depressed cannot merely “pull themselves together” and get better. Without treatment, symptoms can last for weeks, months, or years. Appropriate treatment, however, can help most people who suffer from depression (Stuart, 2004) and (Horwitz, 2010).

In a survey of Asian Tsunami affected population, the incidence of moderate to severe form of mental disorders like anxiety, depression, phobic disorder, and adjustment disorder was to the extent of 30%–50% population. Hurricanes also result in high prevalence of psychiatric morbidity (WHO, 2005). The psychological distress, loss, and displacement resulting from

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weather related violent conflict have been found to be associated with a wide range of mental health impacts including anxiety, depression, and PTSD (WHO, 2002).

Systematic literature reviews on health effects of flooding (Ahern et al, 2005; Menne and Murray, 2013; Alderman et al. 2012) confirmed that lack of high-quality peer reviewed papers on the quantification of the health outcomes of flooding, and that significant gaps in knowledge still exist, especially surrounding mental health outcomes, and the longer-term impacts on health. The lack of evidence regarding the magnitude of mental health problems is of particular concern, given the high priority of these effects within the National Adaptation Programme (NAP) (DEFRA 2013), and the increased policy focus on mental health in general (Department of Health, 2009).

Satller, Kaiser and Hittner (2000) assessed the Relationships among Prior Experience, Personal Characteristics, and Distress while disaster preparedness. It was found that the age, income, internal locus of control, perceived threat, and current distress forecast disaster preparedness from the study of Hurricane Emily. In the study of Hurricane Fran it was observed that the age, perceived threat, and hurricane experience foresee preparation. In a study of The Impact of Catastrophic Events on the Gender Gap in Life Expectancy where a sample of almost 141 countries was selected, it was assessed that the women are most likely to suffer from lower life expectancy as compared to men experiencing natural disasters. It was also seen that there is a cause-and-effect relationship between the disaster and gender gap in life expectancy. Moreover, it was observed that there is a negative correlation between women's socio economic status and the gender gap in life expectancy (Neumayer & Plumper, 2007).

RESEARCH METHODOLOGY

The present study is designed to gain an insight into the selection of subjects, selection of variables, tools used, validity and reliability, procedure of scoring, administration of the inventory, hypothesis and the statistical technique for analysing the data. The purpose of the present study was to find out the post-traumatic stress disorder and depression of flood victims in relation to certain biographical variables.

Locale of the study

As we have mentioned above that the present study is carried out in Madhepura, a district of Bihar. Before going to discuss about the locale of the study it is worthwhile to mention about the brief history of natural disasters in India and about the floods in Bihar.

Sample

Sample from the flood victims for the current study, is drawn from Madhepura district of Bihar. The most flood affected area of the province. The sample of this study is comprised of 1000 adults (500 females and 500 males) of the population. Description of samples is given in the following tables and figures as Table-1

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Table-1 gender vs age of flood victims of Madhepura

		GENDER OF FLOOD VICTIMS OF MADHEPURA * AGE OF FLOOD VICTIMS OF MADHEPURA Crosstabulation		Total	
Count		AGE OF FLOOD VICTIMS OF MADHEPURA			
GENDER OF FLOOD VICTIMS OF MADHEPURA		16-25 LOW AGE	26-70 HIGH AGE		
	MALE	255	245	500	
	FEMALE	285	215	500	
Total		540	460	1000	

Data collection methods and procedures

Our research is based on primary as well as secondary source of data.

Primary data were collected through field visits undertaken in different urban and rural areas of Madhepura district in the post-flood period in 2010 and 2011. The duration of filed visit was for a period of twelve months. A structured psychometrically sound instruments focusing on magnitude and pattern of the psychological problems (Post-traumatic Stress Scale; Mental Health scale; Anxiety Scale; Depression Scale; and Biographical Information Blank) have been administered. Each subject had been approached individually and it was tried out to make a good rapport with the subjects without discriminating any cast and religion. In course of conversation, the subject had been requested to respond on each and every items of each of the questionnaire with complete honesty and without having any hesitations. It was also requested to the subjects to go through the printed instructions of each scale. If there was any doubt or misconception or they needed any clarification during the interaction on any item of the scales, the researcher had tried out at their level best to clarify the difficulties by translating the questions in their local dialect or Hindi so that they could respond with full confidence. The data were recorded on the questionnaires on daily basis as visits were made to different location/places in the affected areas and analysis was done at the end of the visit.

Sample of the present study covered 1000 adults (N=1000) and age range was between 16-70 years. Data were collected from the Mohallas/tolas and villages in the flood affected areas of Madhepura district of Bihar.

Secondary data were collected through desk research on available literature on the subject. The research search was done through internet with the search words like, disaster psychosocial care, tsunami-mental health, disaster induced PTSD and country specific disaster psychosocial care. We additionally searched the internet and the citation listings of relevant publications.

In addition to that various journals in the area of disaster, disaster management, response and mitigation as well as mental health, psychology and psychiatry available either in the form of abstract or full text was also included. Various reports on the issue were collected from the respective organizations.

Scientific tools used

- Post-traumatic Stress Scale (Rahman, 2009):** A Likert-type five point scale was developed by Rahman (2009) to measure post-traumatic stress of victims of natural disaster with different aspects of the post-traumatic experience. The Post-Traumatic

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Stress Scale is a 20-item self-report measure recommended for use in clinical or research settings to measure severity of PTSD symptoms related to a single identified traumatic event. The PDS is unique in that it assesses all of the DSM-IV criteria for PTSD (i.e., Criteria A - F) and inquiries about the past month (time frame can be adjusted for different uses).

2. **The Beck Depression Inventory (Beck, 1961, 1996):** The Beck Depression Inventory is a widely utilized 21-item self-report scale in both clinical and research studies (Beck et al.,1996). The scale was originally developed in 1961 as an interviewer-assisted format but has undergone several revisions over the last 35 years from the BDI-1A (1978), to the most recent version The Beck Depression Inventory-II (1996) which is a completely self-administered format. The Beck Depression Inventory-II is a depression rating scale that can be used in individuals that are ages 13 years and older, and rates symptoms of depression in terms of severity on a scale from 0 to 3 based on the 21 specific items. Patients that endorse multiple items on the questionnaire (i.e. sadness, pessimism, past failure, loss of pleasure, guilty feelings, punishment fears, self-dislike, and so forth) typically have higher scores with a maximum score of 63 compared to others. The sum of the BDI generally represents the severity of the depression with the test being scored differently for the general population compared to those individuals with an established clinical diagnosis of depression. For the general population, a score of 21 or greater is associated with depression but for individuals who have been clinically diagnosed, scores from 0 to 9 represent minimal depressive symptoms, scores of 10 to 16 indicate mild depression, scores of 17 to 29 indicate moderate depression, and scores of 30 to 63 indicate severe depression. Content and use of Beck Depression Inventory The self-report consists of questionnaires that primarily focus on the cognitive distortions that underlie depression (Beck & Steer,1987). The current version of the inventory was specifically developed to serve as an assessment of symptoms that correspond to the criteria for diagnosing depressive disorders listed in the American Psychiatric Association's publication of the Diagnostic and Statistical Manual for Mental Disorders-Fourth Edition- Text Revision (American Psychiatric Association, 2000).
3. **Biographical Information Blank (Swastika & Rahman, 2010):** A Biographical Information Blank (BIB) was prepared by the researchers themselves for the purpose. Some biographical variables like Age, Sex, Family Income, Marital Status, Locale, and some others necessary information included.

Hypotheses of the study

Ho 1: There will be no relationship between Post-traumatic Stress, Depression and Male.

Ho 2: There will be no relationship between Post-traumatic Stress, Depression and Female.

Methods of statistical analyses of the data

On completion of data entry into SPSS (V 16), range and consistency checks were made to make sure the data was clean. Inconsistencies were checked and, where necessary, discrepancies were corrected, the data were declared missing, or the entire case record omitted from analysis.

In order to analyse data, which were primarily nominal data, Pearson's Product Moment Method (PPMM) and t- test were applied to draw results.

Relevance of the study

The relevance of the present study may be assessed by the fact that victims of flood of the Madhepura district are still suffering from psycho-social problems and they are having feeling of deprivation. They are far away from national level of development indices particularly when we observe them in the perspective of industrialization and globalization. The reasons may vary from political pressures to governmental policies as they are living very strained economic conditions.

In such a situation the present investigation will contribute to the knowledge and may be helpful for other researchers and policy makers to facilitate and ensure the residents of Madhepura to take active participation in the field of education, employment, economic, social and psychological development to the nation.

RESULTS AND DISCUSSIONS

The purpose of this study was to examine post-traumatic stress and Depression of flood victims in relation to Gender.

By considering the variable ‘Gender’ and its relationship with Post-traumatic stress and depression, we have computed Correlation. The results have given in the correlation matrix of the Table-2.

Table-2 Correlation between Post-Traumatic Stress, Depression and gender of the Flood Victims

Correlations				
		PTS OF FLOOD VICTIMS OF MADHEPURA	DEPRESSION OF FLOOD VICTIMS OF MADHEPURA	GENDER OF FLOOD VICTIMS OF MADHEPURA
PTS OF FLOOD VICTIMS OF MADHEPURA	Pearson Correlation	1	.266**	.084**
	Sig. (2-tailed)		.000	.008
	N	1000	1000	1000
DEPRESSION OF FLOOD VICTIMS OF MADHEPURA	Pearson Correlation	.266**	1	.180**
	Sig. (2-tailed)	.000		.000
	N	1000	1000	1000
GENDER OF FLOOD VICTIMS OF MADHEPURA	Pearson Correlation	.084**	.180**	1
	Sig. (2-tailed)	.008	.000	
	N	1000	1000	1000

**. Correlation is significant at the 0.01 level (2-tailed).

Elaborating the Table-2 it is to mention that post-traumatic stress was found out to be positively correlated and significant at the 0.01 level (2-tailed) with depression ($r= 0.266^{**}$) as the r value is very high on significant (2-tailed) value .000. it is also observed that post-traumatic stress is highly significant ($r=0.084^{**}$) at the 0.01 level (2-tailed) because the significance value (2-tailed) is very less (.008).it is also clear from the result that gender is highly correlated with post-traumatic stress ($r= .084^{**}$) and depression ($r = .180^{**}$) at the 0.01 level (2-tailed) on the basis of the derived result we can infer that gender is correlated with post-traumatic stress and depression. Thus, our null-hypotheses Ho#11: There will be no relationship between Post-traumatic Stress, Depression and Male and Ho#12: There will be no relationship between Post-traumatic Stress, Depression and Female are being rejected and alternate hypotheses are being accepted. It is confirmed by our results that correlation

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exists in between gender and post-traumatic stress and depression; we further move to know the significant difference between the two groups (male and female) about the perception of stress and depression as they are the victims of flood.

We have analysed independent sample t-test and the results are shown in Table-3

Table-3 t-test between Post-Traumatic Stress and Gender, and Depression and Gender of the Flood Victims

Independent Samples Test									
	Levene's Test for Equality of Variances			Test for Equality of Means					95% Confidence Interval of the Difference
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	
								Upper	
PTS OF FLOOD VICTIMS OF MADHEPURA	7.319	.007	-2.660	998	.008	-.59800	.22404	-.103563	-.15637
						-.59800	.22404	-.103564	-.15638
DEPRESSION OF FLOOD VICTIMS OF MADHEPURA	60.245	.000	-5.766	998	.000	-1.05000	.18210	-1.40734	-.69266
						-1.05000	.18210	-1.40742	-.69250

It is revealed from the Table-3 that the t-value ($t=-2.660$) of post-traumatic stress with $df=998$ is highly significant at 0.05 level of significance as the significance value (2-tailed) is less (0.008) than the t-value. It means there were significant difference between gender and post-traumatic stress. On the other hand, t-value of depression (-5.766) is also found out significant at 0.05 level as the significance (2-tailed) value is very less (0.000). It is confirmed by the result, here, too that significant difference exists between gender and depression.

As we have repeatedly mentioned that gender is divided into two groups, male and female, the results of Table-3 is unable to clarify which group of flood victims is most affected by stress and depression. To clarify this fact, we have further computed Descriptive analysis and the results are shown in Table-4.

Table-4 Descriptive statistics of Post-Traumatic Stress, Depression and Gender of the Flood Victims

Descriptives									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
PTS OF FLOOD VICTIMS OF MADHEPURA	MALE	500	77.6540	3.75906	.16811	77.3237	77.9843	47.00	80.00
	FEMALE	500	78.2500	3.31141	.14809	77.9590	78.5410	50.00	80.00
	Total	1000	77.9520	3.55307	.11236	77.7315	78.1725	47.00	80.00
DEPRESSION OF FLOOD VICTIMS OF MADHEPURA	MALE	500	59.1820	3.44683	.15415	58.8791	59.4849	50.00	63.00
	FEMALE	500	60.2320	2.16785	.09695	60.0415	60.4225	52.00	63.00
	Total	1000	59.7070	2.92536	.09251	59.5255	59.8885	50.00	63.00

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Table-4 is an extension of the Table-3 which depicts the picture regarding the intensity or level of perceived post-traumatic stress and depression of male and female victims of flood of Madhepura.

Table-4 reveals that female flood victims were worst in that situation and that's why they perceived more stress and depression comparatively as the Mean values of post-traumatic stress ($M=78.2500$) and depression ($M=60.2320$) are high. Whereas, comparatively male perception about post-traumatic stress ($M= 77.6540$) and depression ($M=59.1820$) is less.

Our study is in favour of the findings of McMillen, North, Mosley, & Smith, (2002); Powell & Penick, (1983), McMillen et al., (2002), and Mason, Andrews & Upton (2010) as they have emphasized that women are most vulnerable of PTSD and Depression during the natural disasters.

CONCLUSION

The last few years have seen a notable increase in the number and impacts of natural disasters particularly floods in Bihar, either because they are now better measured, affect more people or in fact occur more frequently and are more severe – or probably due to the combination of all or part of them. Consequently, there has been an explosion of studies investigating both the causes and effects of floods in many dimensions. Largely motivated by this, this research work seeks to assess available empirical evidence on the psychological and biographical effects of flood on the accumulation of human capital, a key issue that justifies its importance itself for its economic, social and moral relevance. To achieve this, we conduct a critical review of the relevant literature, aimed to synthesize, integrate and interpret existing findings, and shed some light on remaining knowledge gaps. Since natural disasters have also taken a prominent role in the policy agenda, we provide a set of specific implications for policy that emerge from our findings.

Flooding is one of the natural disasters that have an impact on victims of Madhepura district of Bihar. Natural disasters can lead to unpleasant feelings such as depression. These factors affect the victims involved. This effect is known as cognitive dissonance where one is faced with situations that affect their faith in everyday life and cause a person to experience negative emotions. Stress, anxiety and depression experienced may involve the flood victims of Madhepura for a short period and sometimes it can be long-term. However, since the psychological factors are implicated both theoretically and empirically in the genesis of such behaviors, these actions will be included as mental-health outcome of interest.

Major findings come forward from this work are that disasters are the antithesis of human development. They bring substantial damages, including death and destruction, and seriously jeopardize recovery of human and physical assets. But even when disaster-related mortality is absent, disasters can bring deleterious consequences on nutrition, education, physical health, mental health and many income-generating processes. Along this is the magnitude and persistence of the effects. Indeed, this review of the literature reveals that some of the potential detrimental effects identified can be both large and long-lasting.

Our findings reveal that flood do not affect people equally. There is a high degree of heterogeneity in the size – but not much in the direction – of the impacts on different socioeconomic groups. Inequalities in risk exposure and sensitivity to risk and in access to resources, opportunities and capabilities, put specific segments of the population in a disadvantaged position. Identifying general patterns in the magnitude of the impacts is not

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easy due to the intensity of flood and the complexity of the interactions triggered by them. In spite of this, an incontestable empirical regularity across natural hazards is that the poorest (low-income group) carry the heaviest burden of the effects of floods across different determinants and outcomes of human capital.

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Conflict of Interest

The author declared no conflict of interest.

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