

Psychological Issues of People affected with Flood: A Systematic Review

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Abstract

Introduction: People experience the psychological impact of a disaster before, during, and after the actual occurrence of the disaster event. In particular, during the period of initial disaster response, the behavior and mentality of the public are temporarily disrupted due to stress. In the following period, not only fear but also physical deprivation is experienced. This systematic review is to determine the impact of psychological issues of people affected with flood.

Methods : A thorough literature search from the databases were searched between 2006 and 2020 including MEDLINE, PsycINFO, PubMed, EMBASE, CINAHL, The British Nursing Index, and the Cochrane Central Register from the time period 2000- 2015. Total 15 quantitative studies were included in this review. These studies were conducted across the world which comprises six different countries like China (1), United Kingdom (6), India (3), Australia (2) and Pakistan (2). **Results :** The findings revealed that the prevalence of Post traumatic depression was 80% among the different studies. Nearly 67% of people affected with flood were shown symptoms of anxiety. More than half (60%) of them were depressive due to the flood aftermaths.

Conclusion : Many of the studies recommended initial treatment and psychological intervention for the people affected with flood. There is also an emphasis on special consideration for the vulnerable like infant, old age and pregnant women.

Keywords: Flood, Psychological Issues, Anxiety, Depression & PTSD.

Introduction

Flood is a natural disaster which happens every year, affects both flood prone and non-prone areas of the world resulting in most serious and nonreversible losses. In India more than 10 million people are being affected by flood every year. Floods are mainly caused not only by heavy rain, but also due to encroachment of water bodies for urban development, increase in sea level,

poor drainage, and climate changes. As an immediate consequence, economy, ecosystem and human lives are affected. And loss of valuables, documents, properties, health and opportunities can further affect the victims in post-flood time.

The disaster response team always tries to address the health and physical needs of flood victims in immediate and post disaster time. But the less identified and most neglected area is psychological wellbeing of the people being left. Galea, Nandi and Vlahov (2005) found that the prevalence of post flood PTSD rates varied from 5 to 60% in the first 1–2 years following disaster, although most studies report prevalence rates in the lower half of this range.¹

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Not surprisingly, depression and anxiety are other major psychological disorders which found in flood victims. Norris (2005) found that depression was the second most commonly found disorder among people exposed to disaster after PTSD. In a review of psychological sequelae following disasters, the third most common psychological consequence was anxiety (Norris, Friedman, & Watson, 2002). In particular, generalized anxiety disorder is diagnosed in higher than normal rates in people exposed to disasters, and self-report anxiety is higher than in controls (Norris, 2005).

Even though the flood is a seasonal disaster which can be expected in part of the world, there is no prescribed plans available for addressing the psychological issues of flood victims. The researcher here tried to do a literature search to find the psychological impact of flood across different parts of the world from the studies.

Methodology

Databases were searched between 2006 and 2020 including MEDLINE, PsycINFO, PubMed, EMBASE, CINAHL, The British Nursing Index, and the Cochrane Central Register were searched over time period 2000-2015 for quantitative studies focusing the psychological impact of flood survivors

The search strategy matched the following criteria:

(1) Studies focusing on flood survivors, (2) Psychological impact of flood survivors, (3) flood and mental health outcomes, (4) flood and psychological morbidities, (5) articles recommending interventions for the flood victims, (6) literature published from the year 2000, (7) article published in English. Exclusion criteria set were: (1) article which lacks methodological details, (2) article focuses on impacts of flood other than psychological, (3) psychological impact of other natural and manmade disasters, (4) qualitative and mixed methods (figure1).

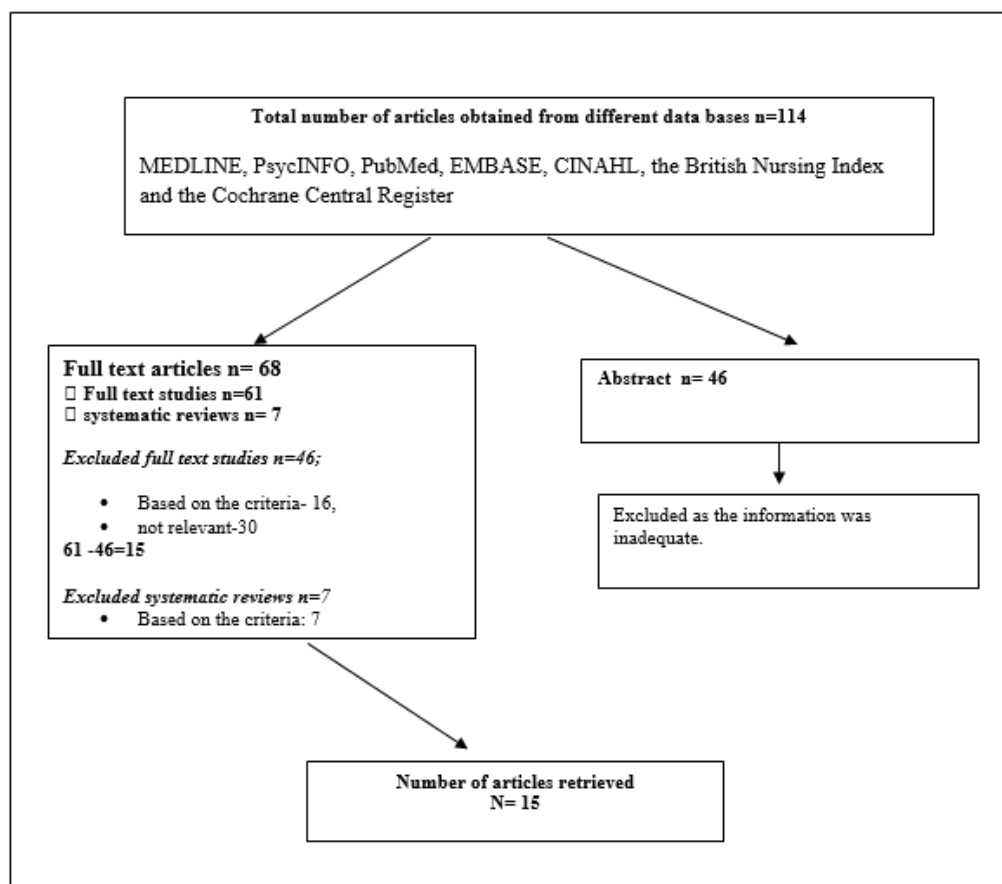


Figure 1: Flowchart of search.

Extracted journals were evaluated and scrutinized based on the selection criteria. And the quantitative studies taken were by ensuring the relevance, appropriateness, clarity in methodology according to the quality assessment tool of quantitative studies. And the data tabulated and classified as: (1) Author, Journal,

year and setting, (2) Research Approach and design sample, (3) tools and techniques, (4) Major findings, (5) psychological impact, and (6) Recommended interventions. Studies were identified according to the sample, sample size, assessment tool and results (Table:1).

Table 1: List of studies included in the review N = 15. List of review from the year 2006 - 2015

S.No	Author, Journal, Year and setting	Research Approach/ Design Sample	Tools & Techniques	Major Findings	Psychological Impact	Recommended Interventions
1.	Liu et al. Can Journal of Psychiatry. China . 2006 ^[1]	Quantitative Retrospective 33 340 Flood victims from households of seven countries	Multi stage Sampling House hold Interview Method DSM IV Criteria was used	PTSD was higher in female and geriatric victims.	A total of 2875 study subjects were diagnosed with PTSD, yielding an incidence of 8.6%.	Provide psychological support along with physical assistance. Special attention to older population
2.	Victoria Mason , Holly Andrews, Dominic Upton Psychological Health Medicine United Kingdom 2010 ^[2]	Quantitative Cross sectional 444 adults exposed to floods.	A questionnaire battery including the Harvard Trauma Questionnaire (trauma and symptoms associated with PTSD), Hopkins Symptom Checklist (anxiety and depression), Coping Strategies Questionnaire	Females had higher mean scores on PTSD, anxiety and depression than males.	27.9% of participants met criteria for symptoms associated with PTSD, 24.5% for anxiety and 35.1% for depression.	Symptoms of distress are a significant issue amongst communities affected by environmental events warranting further attention to prevent chronic distress.
3.	Corinne Peek-Asa , Marizen Ramirez, Tracy Young, YanYan Cao Prehospital and disaster Medicine US Midwestern states. 2012 ^[3]	Quantitative Cross sectional online survey 1231 University students	Online Survey Modified Child PTSD Symptom Scale.	Work disruption was independently associated with decreases in general mental and physical health following the floods, as well as with increases in alcohol use.	Controlling for gender, ethnicity, grade, and damage to the student's home, students reporting work disruption were more than four times more likely to report PTSD symptoms (95% CI, 2.5-8.2).	Focus and planning on work losses is important for the fact Individuals who lose their jobs may be a vulnerable population post-disaster.
4.	Tim R. Wind, Pooran C. Joshi, Rolf J. Kleber Ivan H. Komproe Cambridge University Press India 2013 ^[4]	Quantitative Cross sectional Comparative 318 affected respondents with 308 individuals who were not affected by floods	Hopkins Symptom Checklist-25 (HSCL-25). Short Form-12 (SF-12).	large negative impact of the recurrent floods on mental health outcomes and psychological and physical functioning. However, in a context with recurrent floods, disaster mental health status is not a relevant predictor of functioning.	The affected group showed large to very large differences with the comparison group on symptoms of anxiety (D = .92) and depression (D = 1.22). The affected group scored significantly lower on psychological and physical functioning than the comparison group (respectively D = .33 and D = .80).	Implementing psychosocial context-oriented interventions to address the erosion of the context rather than specific mental health interventions.
5.	Bei B et al. Aging Mental Health Australia 2013 ^[5]	Quantitative Longitudinal prospective design 274 older adults	The surveys included measures of anxiety, depression, self-reported health, and satisfaction with life; the post-flood survey also included questionnaires on flood experience, symptoms of post-traumatic stress disorder (PTSD), stoicism, and psychological coping with floods.	Greater flood exposure and the lack of social support were the risk factors for poorer mental and physical health.	Compared to those not personally affected (78.8%), personally affected individuals (21.2%) reported significantly higher PTSD symptoms, with about one in six	Understanding older adults' psychological responses to disasters and have practical implications for service planning and delivery.

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6	M Ishikawa et al The International Journal Of Social Psychiatry 2013 India ^[6]	Quantitative Cross sectional 318 Flood Survivors	Two-item Patient Health Questionnaire (PHQ-2) Clinical Interview for assessing PTSD		There were only two PTSD cases and five of major depressive disorders.	The social background and temperamental characteristics of the Tibetan culture may play a suppressive role in psychiatric disorders.
7.	Man Cheung Chung, Sabeena Jalal, Najib Ullah Khan Psychiatry Pakistan 2014 ^[7]	Quantitative Cross sectional 131 Flood victims	Post traumatic diagnostic scale, General Health questionnaire-28, Cognitive Distortion Scales, Courttauld Emotional Control Scale	Partial least squares modelling showed that disaster exposure characteristics were significantly correlated with PTSD and psychiatric comorbidity	Victims met the diagnostic criteria for PTSD and scored above the cut-off for psychiatric cases	The flood victims reported PTSD and psychiatric co-morbid symptoms which were related to their subjective exposure to the flood
8	Jessica Elizabeth Lamond, Rotimi D Joseph, David G Proverbs Environmental Research 2015 ^[8] United Kingdom	Quantitative Cross sectional Postal Surveys 280 respondents	Researcher made questionnaire 5- Point Likert Scale	Post flood stressors and coping actions are somewhat correlated with mental health deterioration. The need to relocate is most strongly correlated with mental health issues Most households experienced some anxiety and a minority experienced extreme symptoms of anxiety.	Most households experienced some anxiety and a minority experienced extreme symptoms of anxiety.	Consider the preferences of support with installing mitigation measures may lead to improve mental health outcomes for communities at risk.

Table 2: List of review from the year 2016-2019

9	Aslam Naeem ; Kamal, Anila Pakistan Journal Of Medical Research 2016 Pakistan ^[9]	Quantitative Cross sectional Survey 2000 Individuals from highly flood affected areas	Urdu translated versions of depression, anxiety and stress scale (DASS) and Impact of event scale (IES)	Psychological disorders persists for several years after the disaster and results in significant personal distress.	PTSD 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.	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.
10	Wait TD et al, BMC Public Health England 2017 ^[10]	Quantitative Cross sectional Survey 2126 people lived in flood affected areas	The Patient Health Questionnaire (PHQ 2), Generalised Anxiety Disorder scale (GAD-2) and Post Traumatic Stress Disorder (PTSD) checklist (PCL-6).	Disruption to health/ social care and work/ education was also associated with higher odds of psychological morbidity.	The prevalence of psychological morbidity was elevated amongst flooded participants ([n = 622] depression 20.1%, anxiety 28.3%, PTSD 36.2%) and disrupted participants ([n = 1099] depression 9.6%, anxiety 10.7% PTSD 15.2%).	Disruption to health/ social care and work/ education was also associated with higher odds of psychological morbidity.
11	Tempest LE et al The European Journal of Public Health England 2017 ^[11]	Quantitative Cross sectional survey 2006 Participants	The Patient Health Questionnaire (PHQ 2), Generalised Anxiety Disorder scale (GAD-2)	Men who had probable depression, anxiety or PTSD, 65.3, 70.8 and 74.6%, respectively, had experienced concerns about their house value after the exposure to flooding	Participants who experienced concerns about health had the strongest associations with probable depression and PTSD, whereas those who experienced the loss of items of sentimental value had the strongest association with probable anxiety	Interventions to reduce the occurrence of these secondary stressors are needed to mitigate the impact of flooding on probable psychological morbidity.

Cont... Table 2: List of review from the year 2016-2019

12	Munro A et al, Lancet Planet Health United Kingdom ^[12]	Quantitative Cross sectional survey 622 Participants	PHQ-2 depression scale) and anxiety (measured by the two-item Generalised Anxiety Disorder [GAD]-2 anxiety scale), and post-traumatic stress disorder (measured by the Post-Traumatic Stress Disorder Checklist [PCL]-6 scale).	Scores for depression and post-traumatic stress disorder were higher in people who were displaced and reported receiving no warning than those who had received a warning more than 12 h in advance of flooding (p=0.04 for depression, p=0.01 for post-traumatic stress disorder)	People who were displaced from their homes were significantly more likely to have higher scores on each scale; odds ratio (OR) for depression 1.95 (95% CI 1.30-2.93), for anxiety 1.66 (1.12-2.46), and for post-traumatic stress disorder 1.70 (1.17-2.48) than people who were not displaced.	Local authorities should consider prioritising identification of people who might have mental health problems after flooding among those displaced. Other priority areas could be early warning systems for evacuation and services to enable flooded residents to remain at home where possible.
13	Bhat BA et al. Journal Of Psychiatry India 2018 ^[13]	Quantitative Cross sectional survey 115 Subjects	Semi-structured questionnaire was used to record the socio-demographic status. MINI-International Neuropsychiatric Interview (MINI-Plus) was used to assess the psychiatric diagnosis.	Of 115 patients, 38 (33.04%) were males and 77 (66.96%) were female, with an approximate male to female ratio of 1:2. Mean age of the subjects was 44.01 years	57.39% of subjects had major depressive disorder, 12.17% had generalized anxiety disorder, 6.09% had panic disorder, 6.09% had post-traumatic stress disorder and 4.35% had adjustment disorder	Emotional and psychological needs of the affected population and beginning community based group interventions as early as possible can help to mitigate the development of psychiatric disorders in the affected people.
14	Jermacane et al BMC Public Health England 2018 ^[14]	Longitudinal observational open cohort with 2 years follow up study 1064 responders	The instruments included the Patient Health Questionnaire (PHQ-2) for depression, Generalised Anxiety Disorder scale (GAD-2) for anxiety and Post Traumatic Stress Disorder (PTSD) checklist (PCL-6) for PTSD	Adverse mental health outcomes were higher in the flooded group than among those who were unaffected	Approximately 6% of the participants reported symptoms indicative of depression, 8% of anxiety and 13% of PTSD	Probable psychological morbidity may be at least two years even after exposure to flooding. Health and social care services should be aware that the increased need in populations may be prolonged.
15	Thomas JJ et al. Int J Community Med Public Health. India 2019 ^[15]	Quantitative Cross sectional survey 306 Subjects residing in flood affected areas	Purposive sampling The Patient Health Questionnaire (PHQ-9)	no statistically significant association was found between gender and depression in our study. Geriatric population (67.1%) showed significantly levels of depression which is higher than general population.	48% showed symptoms of depression. 28.10% were mildly depressed, 12.74% were moderately depressed, 5.56% had moderately severe and 1.63% had severe depression.	Screening for the psychiatric morbidities and early intervention by the psychiatrists and psychologists is required to be done to the affected victims.

Results

Majority of the studies were large scale. The sample size found in different studies tabulated from 115 to 33 340 with a total of 44575 subjects with a mean of 2971.6. Study participants were selected from households, rehabilitation centers, and community of flood affected areas. The scale and evaluation tools used in the studies were: DSM IV Criteria, Harvard Trauma Questionnaire, Hopkins Symptom Checklist (anxiety and depression), Coping Strategies Questionnaire, Modified Child PTSD

Symptom Scale, Hopkins Symptom Checklist-25, Two-item Patient Health Questionnaire, Posttraumatic Diagnostic Scale, General Health Questionnaire- 28, Cognitive Distortion Scale, Courtauld Emotional Scale ,Depression, anxiety and stress scale (DASS) and Impact of event scale (IES), Generalized Anxiety Disorder scale (GAD-2) and Post Traumatic Stress Disorder (PTSD) checklist (PCL-6), and MINI-International Neuropsychiatric Interview (MINI-Plus

Table :2 Psychological impact of flood

Sl no:	Psychological impact	Number of studies	%
1.	Post traumatic stress disorder (PTSD)	12	80
2.	Anxiety	10	67
3.	Depression	09	60

Discussion

The current systematic review found that there was a significant psychological impact among people affected with flood. The prevalence of PTSD were most common comprising of almost 80% in the selected studies. Anxiety were seen in 67% and the symptoms of depression was found in more than half of flood population.¹⁶

In a study conducted in India, among the participants 48% showed symptoms of depression. 28.10 % were mildly depressed, 12.74% were moderately depressed, 5.56% had moderately severe and 1.63% had severe depression.¹⁵ Major tsunami disaster of 2004 showed 43% prevalence of clinically significant psychological distress. 31% of participants had very high levels of psychological distress.¹⁶

In 2018, the southern state of Kerala had been hit by a flood 42.2% of male exhibited depressive symptoms. The UK longitudinal cohort study conducted by Jermacane et al in 2018 found that the prevalence of Depression, Anxiety and PTSD were significantly higher after the flood compared to those who were not affected.¹⁴ This is also in line with the findings of Munro et al revealed the people who displaced from their homes were significantly more likely to have higher odds for depression 1.95 (95% CI 1.30–2.93), anxiety 1.66 (1.12–2.46), and post-traumatic stress disorder 1.70 (1.17–2.48) than people who were not displaced¹¹

A cross sectional study conducted among the flood victims of 2014 Kashmir floods reported major depressive disorder(57.39%), generalized anxiety disorder (12.17%), panic disorder(6.09%), had post-traumatic stress disorder(09%) were present.¹³

The role of gender is also found to be a significant factor although it may vary from across the studies. The impact of flood had been largely affected by women.^{1, 17,18} There is an association between PTSD and female counterparts whereas for men, the association was found between relationship problems and probable depression.¹⁹ A study from Pakistan reported though both genders were affected females were more vulnerable to depression, stress and PTSD which found to be significant.⁹

Another factor which had an impact during flood was the age, In an Indian study the prevalence of depression was maximum in geriatric population (67.1%) which was significantly higher than general population this was in concordance with findings of a Canadian study. However after a Pakistan flood adolescents between 16 to 20 years were highly affected whereas, least affected were the old age group.⁹ Apart from that low socio-economic status, seen to be related to higher levels of symptoms across multiple studies.²⁰ The flood victims reported PTSD and psychiatric co-morbid symptoms which were related to their subjective exposure to the flood.⁷ A study conducted in Australia reported greater flood exposure and the lack of social support were the risk factors for poorer mental and physical health.⁵

From the light of the above findings it was found that there is need of prompt assessment to understand the magnitude of mental health impact on flood survivors. Recognizing the physical, social, vocational and most importantly psychological concerns of the affected. Several factors has to be considered while dealing the flood survivors like age, gender, history of previous psychiatric illness and socioeconomic status. Providing psychological support along with physical assistance with special attention to older population. Implementing

psychosocial context-oriented interventions to address the erosion of the context rather than specific mental health interventions. Moreover, Focus and planning on work losses is important for the fact Individuals who lose their jobs may be a vulnerable population post-disaster. Consider the preferences of support with installing mitigation measures may lead to improve mental health outcomes for communities at risk

Conflict of Interest: None

Source of Funding: None

Ethical Clearance: Not required as it was a systematic review

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