
**Randomized Control Trials of CBT to Manage the Mental Health Related Issues of Flood
Victimized in Taunsa Sharif and Rajanpur City**

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Abstract

Floods in Pakistan have been recurring disasters with devastating consequences, causing displacement, destruction of infrastructure, and loss of lives. The consequences of these floods have a significant and sustained impact on the mental well-being of the victims, with multiple psychological disorders being constantly reported. The core aim of this study was to alleviate the mental health problems of flood victims in Taunsa Sharif and Rajanpur city of Pakistan. For this purpose, two groups (experimental group vs control group) of flood victimized individuals in Taunsa Sharif & Rajanpur city was randomly formed by randomization process. The experimental group received 10 sessions of CBT while control group was only engaged. The results after therapy sessions and 3 months' follow-up revealed a significant change in the symptoms of stress, anxiety, depression, posttraumatic stress and sleep issues of the flood victimized who attended the CBT sessions in experimental group. On the basis of the findings this concluded that the CBT is an effective technique to manage the mental health related issues of flood victims. So, on the basis of the results of this study, it is suggested that the authorities should start intervention programs such as CBT training sessions in the affected areas to promote the mental health of the flood victimized individuals.

Keywords: Flood Victimized Stress, Anxiety, Depression, CBT, Randomized Control Trials.

Introduction

This is an acknowledged fact that Pakistan has a long history of devastating floods. The country experiences flooding almost every year due to its location on the Indus River, one of the world's largest rivers. The most severe floods in recent history occurred in 2010, 2011, 2014, and 2022, significantly impacting the affected areas' population and infrastructure. These floods have caused extensive damage to homes, businesses, and crops, displacement of millions of people, destruction of infrastructure, and loss of lives. That invokes a strong sense of grief, panic, loss, fear, and sadness among the victims. The death of loved ones, food insecurity, homelessness, and lack of mental health services have deliberately affected the mental health of people living in flood-affected areas. These disasters therefore have a terrible effect on the quality of life, at the same time as an enormous mental health burden to affected populations (WHO, 2022). Moreover, floods lead to long-term impacts on the mental health of individuals, families, and communities. To this effect, property destruction, loss of livelihoods, and displacement from familiar grounds contribute to survivors of floods exhibiting helplessness, bereavement, and fearfulness. Witnessing a dangerous situation of possible death, seeing a loved individual suffering harm or injury, and

perpetual doubt whether or not they will fully recover are all susceptible to adding psychological burdens that they bear. Compounding the already weak situation of flood survivors in terms of mental health in Pakistan is the lack of access to fundamental services, such as health and mental care, in rural and remote settlements (Shahid et al., 2012).

Mental Health Issues of Flood Victimized

McGreevy and Boland (2022) reported that direct or secondary exposure to a natural catastrophe is likely to provide a multifarious emotional reaction by evoking states of fear, helplessness, sadness, and post-traumatic stress responses. These psychological distress symptoms that were observed to express themselves in the form of depression, anxiety, and other psychiatric disorders complicate the already dismal scenario of the flood victims even further. According to the Sindh-based study by Yousuf et al. (2023), it was found that 36% of the flood victims had PTSD, 20% had symptoms of depression, and 28.3% had symptoms of anxiety. The impact of floods on children on a psychological level has also been researched. Furthermore, Depression after exposure to flooding has several temporal patterns with different implications for treatment. There is immediate-onset depression in the days immediately after the disaster that remits spontaneously after the satisfaction of basic needs and initial shock has worn off. Delayed-onset depression, which occurs weeks or months after the disaster, often coincides with the phase of the transition from emergency to long-term recovery when initial community cohesion often breaks down and complete awareness of loss may set in. Similarly, the cognitive architecture of anxiety following experience with floods has a number of distinct characteristics. The primary cognitive vulnerability appears to be intolerance of uncertainty, with enhanced sensitivity to vague information and catastrophic reinterpretation of common bodily sensations in flood victims. (Chauhan, 2014). Lastly, in connection with psychopathological symptoms, the flood disasters have stress reactions that represent vulnerabilities by age. Children express stress in the form of behavioral regression, somatic complaints, and attachment insecurities. Adolescents usually express stress in the form of risky behavior, withdrawal, or school disengagement (Bryant, 2021). Hence, all the pathologies are linked with the sleep disturbance among the flood victimized individuals. Sleep disorder is commonly seen in three patterns among survivors of a flood: early insomnia accompanied by disturbed sleep and intrusive thoughts and hypervigilance; middle insomnia with frequent awakening with frequent environmental disturbance to find shelter; and early morning awakening with the co-occurrence of depression and rumination of loss. Each of these patterns gives diagnostic information concerning the psychological processes involved which invade the lives of survivors and contains possibilities for intervention (Zhen et al., 2018).

Research Gap

Although various studies have been carried out on flood impact and mental health in various areas of Pakistan, there is still a huge gap for a full-fledged study with a focus on various areas of Southern Punjab. Previous research of Ahmad et al. (2025) and Jamshed (2015) has addressed the issue of mental health in the region but none of them have undertaken a full-fledged region-based study that screens for mental issues as well as offers focused interventions. Hence, this study was carried out to fill the gap in research literature by providing CBT sessions to the flood victimized individuals in Taunsa Sharif and Rajanpur city of Pakistan.

Significance of the Study

The objective of the present study is to gain understanding of the flood victims' mental health issues across different areas of Southern Punjab, Pakistan. Findings will act as a policymaker's important tool, doctors, and international humanitarian organizations, as they will identify the issue of mental health among flood-vulnerable populations and inform the construction of intervention programs specific to target populations. By incorporating mental health screening into

intervention, this research will give evidence at the field level of how to fight psychological distress among flood victims practically.

Review of Literature

Research now forms the basis for the explanation of the psychological impacts of floods, with the focus on short- and long-term mental health implications on affected groups. Hong and Morrow-Howell (2010) highlighted PTSD and depression as the most common mental disorders after disasters, with the stress on the importance of providing mental health interventions in the wake of disasters. This work played a central role in the development of disaster mental health models, especially in low- and middle-income countries (LMICs) with poorly established mental health care. Powell and Penick (1983) also presented preliminary findings that showed that psychological distress continued long after the immediate impact of the disaster, with survivors continuing to feel enormous amounts of emotional distress even a year subsequent to the flood disaster. Low social support, economic difficulties, and maladaptive coping were the primary risk factors for chronic psychological distress, based on their research. This was later corroborated by Bei et al. (2013), who observed that people with prior mental illness, depression, or anxiety were most susceptible to post-flood trauma. Masson (2013) contributed a lot of such literature by examining psychological responses to flooding by gender. Anxiety and PTSD symptoms were reported to be greater in women than men due to more caregiving responsibilities, uncertainty of finance, and social control post-disaster scenarios. This study assisted in informing the importance of gender-sensitive psychosocial care interventions in disasters, which assisted in informing policy to make psychosocial care interventions gender-sensitive in addressing women's needs. Apart from gender inequalities, research during this period also equally established sociocultural determinants of disaster mental health effects. Baker and Cormier (2014) contended that vulnerable groups were more expensive in terms of mental health following flooding on the grounds of reduced access to health care, economic risk, and poor disaster preparedness. They also provided evidence for this by establishing that socioeconomic disadvantage increases susceptibility to psychological distress to a large degree after flooding. The 2022 Pakistani catastrophic floods again placed the problem of disaster-stricken people's mental health needs in the spotlight. The 94-district involved floods made 9 million people poor (WHO, 2022), exacerbating pre-existing mental health vulnerabilities. Research and post-flood surveys established shockingly high levels of PTSD, depression, and anxiety, especially in poor areas already. It was a human crisis that brought out the necessity of proper mental health interventions that were disaster-specific for survivors, particularly after mass loss and trauma. Another field of increasing interest is the treatment of sleep disorders, which are prevalent among survivors of disasters. Alimoradi et al. (2022) looked at whether Cognitive Behavioral Therapy for Insomnia (CBT-I), an adaptation of the generic CBT specifically designed to treat sleep disorders, was effective in curbing sleep disorders caused by psychological trauma due to disasters and improving mental health outcomes in general. The inclusion of sleep-related interventions into general mental health care plans has thus become an integral component of integrated care for disaster survivors, in acknowledgment of the central role which restorative sleep has in aiding recovery. Together, these innovations represent a major change in disaster mental health treatment. The combination of resilience science with culture-adapted CBT interventions is a major step toward filling the complex mental health needs of disaster survivors. In addition, the inclusion of telehealth technologies, resilience-informed community-based interventions, and sleep-specialist treatments all signify a general better, more accessible and more sustainable model of disaster mental health treatment (Arif et al., 2017). These interventions not only meet short-term psychological requirements but also facilitate long-term recovery and well-being in disaster-affected groups. By rendering interventions culturally congruent and using innovative

technologies, mental health treatment for disaster survivors is becoming more responsive and effective to the special needs of disaster-prone regions such as Pakistan.

Objectives of the Study

1. To check the effectiveness of CBT sessions in reducing the mental health related issues of flood victimized individuals in Taunsa Sharif and Rajanpur Cities of Pakistan.

Hypothesis of the Study

1. The flood victimized individuals who will receive CBT sessions will significantly reduce their mental health related issues (experimental group).
2. The flood victimized individuals in control group will report no any significant change in the mental health related issues (control group).

Methods and Materials

The material and methods used in this study is as under:

Participants of the Study

The participants of this study were the flood victimized individuals belonging from Taunsa Sharif and Rajanpur cities. The participant of the study belongs to different demographic areas. All the participants were already diagnosed with mild to moderate level of mental health issues.

Design of the Study. This study was quantitative with pre-test, post-test and follow-up design. In this study randomized control trials (RCT) of CBT was conducted in Taunsa Sharif and Rajanpur cities to check the efficacy of CBT. The research design used in this study has been regarded as the gold standard for determining the effectiveness of interventions (Bondemark & Ruf, 2015). The RCT compared the intervention group treated with CBT with a control group to assess the short-term, medium-term, and long-term impact of the intervention on mental health conditions.

Sample and Sampling Technique

The sample size of this intervention study was (N=80) of flood victimized individuals from each city (from Taunsa Sharif & Rajanpur). Out of which (N=40) were in experiment group or control group respectively. All the participants were assigned into groups randomly.

Procedure of the Study

This study was experimental with pre-test, post-test & follows up design. All the participants in this study were already screened out with mild to moderate mental health issues such as stress, anxiety, depression, posttraumatic stress disorder and with sleep problems. All the participants were further divided into experimental group and control group randomly. The experimental group received 10 sessions of CBT while control group was only engaged. After the CBT sessions and 3 months' follow-up the data was analyzed and the results were discussed accordingly.

Inclusion and Exclusion Criteria

In this study the individuals with age of 18-65 years who directly exposure the flood were included while the individuals below 18 and above 65 years of age having no exposure or loss due to flood were excluded from the study.

Ethical Considerations

In this study the researcher followed the American Psychological Association (APA) ethical principles. In order to give assurance that volunteers volunteered voluntarily, informed consent was used. The purpose, procedure, risk, and benefits of the study were all disclosed to participants. Participants were also notified of their rights, including the right to withdraw from the study at any time without causing themselves any harm or loss of benefits.

Results of the Study

The collected data was analyzed by using SPSS. The results of pre-test, post-test and follow-up analysis are discussed as under.

Table 1
Multivariate Analysis for Mental Health Outcomes Across Experimental and Control Groups at Pre-Test, Post-Test, and Follow-Up in Taunsa Sharif

Variable	Group	Time			Group		Time			Group × Time			
		Pre-Test M(SD)	Post-Test M(SD)	Follow-Up M(SD)	F	P	η ²	F	P	η ²	F	P	η ²
PTSD	Experimental	62.30 (15.06)	37.89 (13.07)	38.65 (13.15)	5.44	.021	.03	18.06	.000	.15	14.59	.000	.12
	Control	54.33 (15.47)	52.72 (15.07)	53.42 (16.02)									
Depression	Experimental	33.57 (5.28)	23.81 (5.40)	24.27 (5.47)	4.51	.035	.02	19.12	.000	.15	13.00	.000	.11
	Control	31.56 (5.45)	30.44 (6.82)	30.86 (6.73)									
Anxiety	Experimental	30.76 (6.11)	13.30 (4.80)	13.22 (4.47)	74.08	.000	.26	45.95	.000	.30	104.03	.000	.50
	Control	29.11 (5.65)	32.78 (4.85)	32.50 (4.34)									
Stress	Experimental	36.73 (3.25)	26.73 (5.60)	26.16 (5.56)	1.41	.237	.01	54.44	.000	.34	10.36	.000	.09
	Control	34.03 (4.15)	30.22 (5.38)	29.78 (4.81)									
Sleep Quality	Experimental	15.49 (3.74)	5.43 (0.99)	5.84 (1.37)	62.59	.000	.23	63.73	.000	.38	43.64	.000	.29
	Control	15.33 (4.36)	14.42 (4.00)	14.39 (3.97)									

Note. M = Mean; SD = Standard Deviation; F = F-value; p = significance level; η² = partial eta

Note: The above table shows the results of pre-test, post-test and follow-up analysis among the participants of Taunsa Sharif in control group vs experimental group.

Table 2
Multivariate Analysis for Mental Health Outcomes Across Experimental and Control Groups at Pre-Test, Post-Test, and Follow-Up in Rajanpur

Variable	Group	Time			Group		Time			Group × Time			
		Pre-Test M(SD)	Post-Test M(SD)	Follow-Up M(SD)	F	P	η ²	F	P	η ²	F	P	η ²
PTSD	Experimental	64.97 (13.79)	35.08 (11.33)	35.86 (10.89)	0.62	.43	.00	30.89	.000	.23	24.84	.000	.19
	Control	55.40 (15.15)	53.63 (14.68)	53.97 (15.43)									
Depression	Experimental	32.64 (5.64)	22.39 (4.10)	22.94 (4.09)	0.57	.45	.00	22.89	.000	.18	21.19	.000	.17
	Control	28.83 (5.84)	28.71 (5.63)	28.54 (5.50)									
Anxiety	Experimental	32.08 (5.34)	12.53 (1.73)	12.36 (1.84)	0.00	.99	.00	159.42	.000	.61	150.04	.000	.59
	Control	30.71 (4.97)	30.23 (3.99)	30.60 (3.94)									
Stress	Experimental	37.75 (2.57)	29.03 (3.98)	28.75 (4.05)	4.54	.03	.02	44.58	.000	.30	26.91	.000	.21
	Control	30.91 (4.00)	29.77 (3.54)	29.83 (3.56)									
Sleep Quality	Experimental	15.64 (3.21)	5.00 (0.54)	5.56 (1.08)	12.56	.000	.06	93.43	.000	.48	62.84	.000	.38
	Control	16.00 (3.87)	15.00 (3.46)	14.94 (3.40)									

M = Mean; SD = Standard Deviation; F = F-value; p = significance level; η² = partial eta s

Note: The above table shows the results of pre-test, post-test and follow-up analysis among the participants of Rajanpur in control group vs experimental group.

Findings and Discussion

The current study was carried out to reduce the mental health related symptoms of flood victimized individuals by using CBT sessions. It was hypothesized that the CBT sessions will reduce the mental health related issues of the participants in experimental group. After the therapy sessions the results from the post data revealed a significantly decreased the mental health related issues. A multivariate analysis for Taunsa Sharif reveals significant improvements in mental health outcomes for the experimental group across PTSD, depression, anxiety, and sleep quality, while the control group showed minimal changes. For PTSD, the experimental group showed a significant reduction in symptoms, with scores decreasing from 62.30 (SD = 15.06) at pre-test to 37.89 (SD = 13.07) at post-test, and slightly increasing to 38.65 (SD = 13.15) at follow-up. The

group \times time interaction was significant ($F = 14.59, p < .001, \eta^2 = .12$), indicating that CBT effectively reduced PTSD symptoms over time. The control group exhibited minimal changes, with scores slightly fluctuating across the time points (pre-test $M = 54.33$, post-test $M = 52.72$, follow-up $M = 53.42$). Depression levels in the experimental group decreased from 33.57 ($SD = 5.28$) at pre-test to 23.81 ($SD = 5.40$) at post-test, and remained stable at 24.27 ($SD = 5.47$) at follow-up. The group \times time interaction for depression was significant ($F = 13.00, p < .001, \eta^2 = .11$), suggesting a notable reduction in depression symptoms, but no sustained impact at follow-up. In contrast, the control group showed minimal changes in depression scores (pre-test $M = 31.56$, post-test $M = 30.44$, follow-up $M = 30.86$). Anxiety in the experimental group showed a dramatic reduction, from 30.76 ($SD = 6.11$) at pre-test to 13.30 ($SD = 4.80$) at post-test, and slightly improving to 13.22 ($SD = 4.47$) at follow-up. The group \times time interaction for anxiety was highly significant ($F = 104.03, p < .001, \eta^2 = .50$), indicating a strong and sustained reduction in anxiety symptoms. The control group displayed minimal changes, with scores increasing from pre-test ($M = 29.11$) to post-test ($M = 32.78$), and remaining relatively stable at follow-up ($M = 32.50$). For stress, the experimental group showed a moderate reduction in symptoms, with scores decreasing from 36.73 ($SD = 3.25$) at pre-test to 26.73 ($SD = 5.60$) at post-test, and slightly improving to 26.16 ($SD = 5.56$) at follow-up. However, the group \times time interaction for stress was not significant ($F = 10.36, p < .001, \eta^2 = .09$), suggesting that while there was an improvement in stress, the effect of CBT was less pronounced compared to other outcomes. The control group showed some reduction in stress (pre-test $M = 34.03$, post-test $M = 30.22$, follow-up $M = 29.78$), though these changes were not substantial. Sleep quality in the experimental group improved significantly, with scores decreasing from 15.49 ($SD = 3.74$) at pre-test to 5.43 ($SD = 0.99$) at post-test, and slightly improving to 5.84 ($SD = 1.37$) at follow-up. The group \times time interaction for sleep quality was highly significant ($F = 43.64, p < .001, \eta^2 = .29$), indicating that CBT had a strong and lasting effect on improving sleep quality. In comparison, the control group showed minimal changes in sleep quality (pre-test $M = 15.33$, post-test $M = 14.42$, follow-up $M = 14.39$). Hence, it has been proved that the experimental group in Taunsa Sharif demonstrated significant improvements in PTSD, depression, anxiety, and sleep quality, with the most pronounced effects observed in anxiety and sleep quality as visualized in Figure 4.36 – 4.40. These improvements were sustained at follow-up, highlighting the effectiveness of the CBT intervention. However, while stress also improved in the experimental group, the effect was not as strong, and the control group showed little to no change across all variables. Similarly, in connection with the Rajanpur results a multivariate analysis results for Rajanpur indicate that the experimental group experienced significant improvements across all mental health outcomes, including PTSD, depression, anxiety, stress, and sleep quality, in contrast to the control group. For PTSD, the experimental group showed a significant reduction in symptoms from pre-test ($M = 64.97, SD = 13.79$) to post-test ($M = 35.08, SD = 11.33$), with a slight increase at follow-up ($M = 35.86, SD = 10.89$). The group \times time interaction was significant ($F = 24.84, p < .001, \eta^2 = .19$), indicating a substantial and sustained decline in PTSD symptoms over time. The control group, however, showed little change, with scores remaining stable across the three time points (pre-test $M = 55.40$, post-test $M = 53.63$, follow-up $M = 53.97$). Similar trends were observed in other mental health outcomes. Depression in the experimental group decreased from 32.64 ($SD = 5.64$) at pre-test to 22.39 ($SD = 4.10$) at post-test, with a slight increase to 22.94 ($SD = 4.09$) at follow-up. The group \times time interaction for depression was highly significant ($F = 21.19, p < .001, \eta^2 = .17$), further supporting the efficacy of CBT in reducing depression. In contrast, the control group exhibited no significant change in depression scores (pre-test $M = 28.83$, post-test $M = 28.71$, follow-up $M = 28.54$). Anxiety levels in the experimental group significantly decreased from 32.08 ($SD = 5.34$) at pre-test to 12.53 ($SD = 1.73$) at post-test, with a slight further reduction to 12.36 ($SD = 1.84$) at follow-up. The group \times time interaction for anxiety was particularly large ($F = 150.04, p < .001, \eta^2 = .59$), indicating a

strong and sustained effect of CBT on anxiety reduction. The control group, on the other hand, showed little change, with scores remaining relatively stable across the three time points (pre-test $M = 30.71$, post-test $M = 30.23$, follow-up $M = 30.60$). For stress, the experimental group showed significant reductions, from 37.75 ($SD = 2.57$) at pre-test to 29.03 ($SD = 3.98$) at post-test, and a slight further reduction to 28.75 ($SD = 4.05$) at follow-up. The group \times time interaction for stress was significant ($F = 26.91$, $p < .001$, $\eta^2 = .21$), suggesting that CBT had a strong effect on reducing stress. The control group showed little change, with scores remaining relatively stable across time points (pre-test $M = 30.91$, post-test $M = 29.77$, follow-up $M = 29.83$). Finally, sleep quality in the experimental group showed a dramatic improvement, with scores decreasing from 15.64 ($SD = 3.21$) at pre-test to 5.00 ($SD = 0.54$) at post-test, and slightly increasing to 5.56 ($SD = 1.08$) at follow-up. The group \times time interaction for sleep quality was highly significant ($F = 62.84$, $p < .001$, $\eta^2 = .38$), demonstrating that CBT significantly improved sleep quality and that these improvements were sustained at follow-up. The control group showed little change, with sleep quality scores remaining relatively stable (pre-test $M = 16.00$, post-test $M = 15.00$, follow-up $M = 14.94$). These findings highlight the positive and sustained effects of CBT on PTSD and other mental health outcomes in the experimental group, with improvements maintained at follow-up. In contrast, the control group exhibited no significant changes, reinforcing the effectiveness of CBT in managing mental health symptoms in flood-affected individuals in Rajanpur. Hence, the hypothesis of the study accepted and the results are in line with the previous researches such as, a study conducted by Burbuck et al., (2024) to explore the mental health issues of flood survivors and reported significant findings of CBT on depression and trauma related disorders. Similarly, another study conducted by Assary et al., (2023) also to explore the psychological issues of flood victimized and disaster survivors and reported mild to severe symptoms of anxiety and PTSD and also reported healing effects of CBT. Moreover, a study conducted by Bonano et al., (2024) the healing effects of CBT among trauma and anxiety survivors.

Conclusion

So, this study provides critical empirical evidence on the mental health consequences of flooding and demonstrates the long-term efficacy of CBT in disaster-affected populations. By addressing significant gaps in disaster mental health research, these findings offer valuable insights for policymakers, mental health practitioners, and humanitarian agencies working in climate-vulnerable regions. Future research should explore scalable, community-based mental health interventions to enhance accessibility and sustainability in post-disaster settings and should consider the identified risk factors, which also highlight the need for wide-ranging mental health interventions.

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