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ORIGINAL CONTRIBUTION

Prevalence of Psychiatric Morbidity Among Victims of Terrorist Attacks: Comparative Study

Haroon Rashid [1*], Muhammad Rizwan [2]

[1] Clinical Psychologist, Combined Military Hospital, Peshawar, Pakistan

[2] Director, Centre for Counselling and Social Well-being, University of Haripur, Haripur, Pakistan

Abstract— To evaluate the occurrence of psychiatric morbidity Posttraumatic Stress Disorder (PTSD); mood state; (state of depression, anxiety, stress) and its effect on general health among victims of terrorist attacks (mild injuries, severe injuries & amputation) in Peshawar, Khyber Pakhtunkhwa. Current study was a cross-sectional correlational research applied on three groups of admitted patients; who were injured during attacks (with mild injuries, severe injuries & severe injuries along with amputation), the data were collected after one week of attack during from the patients who had direct exposure to terrorist attacks and sought treatment from Combined Military Hospital, Peshawar, Pakistan, during the period of November 2021 to September 2022. Sample included all the survivors who sought medical assistance from the hospital. The instruments comprised upon Impact of Event Scale Revised (IES-R 22), General Health Questionnaire (GHQ-12), and Depression, Anxiety and Stress Scale (DASS-21). PTSD has positive association with Depression, Anxiety and Stress but negative association with General Health Questionnaire among terrorists' attack victims. The terrorist attack victims had significantly higher psychiatric morbidity than non-exposed participants. Psychiatric morbidity was found highest in the victims of survivors of bomb blasts.

Index Terms— Psychiatric morbidity, Mood state, General health, Terrorist attacks

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Introduction

Unfortunately, Pakistani nation has been the target of suicide bomb blasts by the terrorists for the last two decades and resulting directly in deaths and injuries of innocent citizens which aroused massive feelings of stress, anxiety, depression and mental trauma among the survivors. In this war on terrorism 80,000 (https://tribune.com.pk/story/860790/80000-pakistanis-killed-in-us-war-on-terror-report), Pakistani have been sacrificed their costly lives from 2004 to 2022 and large numbers were taken to the emergency department of various hospitals. The enormousness of substantial destruction of the terrorist attacks were exceptional in the Asia.

The terrorism had become growing trend in Pakistan, resultantly many mental health issues surfaced. The research conducted (Dawn, 2001-2011) witnessed an almost 100% increase in the occurrences of psychological disorders, especially stress-related disorders, and depression.

After September 9/11 attacks of United States Pakistan was exposed to extreme terrorism because she supported United states in the war against terrorism. This caused mass penetration of terrorists from North-Western boundary due to which thousands of Pakistani people lost their lives.

[*] Email: haroonrashid27@gmail.com

In this war most affected province of Pakistan was Khyber Pakhtunkhwa that constantly remained under terrorist attacks and one of the worst of the wave unfortunately appeared in its capital city Peshawar.

Posttraumatic Stress Disorder (PTSD) was most significant, recurrent and devastating emotional illness reported in the repercussion of terrorist attacks (Galea, 2002; North, 1999). Many researches have displayed high load of PTSD in precise groups such as adults in the general public (Galea, 2002), direct sufferers of terrorist assaults (Norris, 2002), or rescue workers (North, 1999) subsequent tragedies. The researches about other psychological significances of tragedies are considerably limited, even though it has been displayed depression, anxiety disorders other than PTSD whereas panic illnesses were more prevailing after tragedies than in non-tragedies conditions (Norris, 2002).

A research work conducted (Glad et al., 2017) that increased number of contacts to trauma reminders led to higher level of severity of PTSD (Abbas. et al., 2017), anxiety disorders along with major depressive disorders. Study Cozza et al., (2019) summarized that comorbid psychiatric situation amplified the risk of emerging PTSD, major depressive disorders and anxiety disorders. Furthermore, posttraumatic stress disorder, acute stress reaction, anxiety disorder and depression remained higher in patients of landmine injuries than the over-all public sample (Sinici et al., 2004 & Gunaratnam et al., 2003). In addition, landmine injuries were recognized as a risk factor for worse mental health and poorer social functioning outcomes (Cardozo et al., 2004).

Large number of longitudinal researches work headed on PTSD and depression after 11 September 2001 analyzed 14.2% and 15.3% among survivals (Jordan, et al., 2019), many other personals e.g., emergency responders, police officers, ambulance facility individuals and firemen (Sterud et al., 2006; Berger et al., 2007; Maguen et al., 2009) and many other disorders including somatization, anxiety disorders and general psychopathology (Sterud et al., 2006; Lilly et al., 2009). Researches have concluded that prevalence of PTSD in survivors of the terrorist attacks increased 12% to 39% and post disaster depression increased from 41% to 51% (Galea & Resnick, 2005; Shalev & Friedman, 2005; Farhood & Nourredine, 2003). Another study showed more prevalence of depression, anxiety disorders, panic disorders other than PTSD after disaster than in non-disaster situations (Norris et al.,2002). A study conducted on landmine injuries summarized that survivor presented 90% posttraumatic stress disorder and high percentage of anxiety and depression (Gunaratnam et al., 2003).

Our study contains two main objectives. First objective was that victims who survived after the bomb/ terrorist attacks tolerate few permanent repercussion including amputations, burns, blindness, multiple fractures, injuries, wounds and many lost their life. Hence study will explain the prevalence of psychiatric morbidity (PTSD, Depression, anxiety & stress and general mental health) in three groups among survivors (mild injuries, severe injuries & amputation) during the period of November 2021 to September 2022. Second goal of study is to develop psychological guidelines for the survivors in the light of symptoms and problems depicted during interaction (interview) due to terrorist suicide attacks after the completion of the study. In this regard many states of the art hospitals and rehabilitation centers were built to treat and restore the physical trauma of the war wounded people in Pakistan but unfortunately very little work has been done to address the awareness regarding mental trauma of victims of bomb blast, especially for amputees and severely injured patients. So, the aim of research is to cover the gap between physical and psychological trauma aspects and to develop stance which would be addressed via future study work.

Endeavor has been made to gather maximum researches but one of the major challenges in simplifying literature from the adversity is that very limited research work has concurrently been considered for the psychological implication of adversity among various groups simultaneously and research approaches.

Method

This was retrospective cohort cross-sectional study, conducted from September 2021 to September 2022 with purposive sampling along with quantitative survey method was used for study. During this tenure twenty-two incidents of bomb blasts have been reported. In total, two hundred and thirty-one victims were brought to the accident-emergency services of Combined Military Hospital, Peshawar. Out of two hundred and thirty-one patients only ninety were selected through simple random sample for this research. Each registered victim had admission numbers. Admitted patients from Intensive Care Unit (ICU) with more than one week were taken and their registered records were nominated rendering to a table of random numbers.

Sample

The total sample was 120 participants (only salaried person) who were divided into two major groups. First group was patients with injuries due to bomb blast (n=90). These patients were admitted in hospital (n=90) who were injured due to terrorist attacks. This group was further divided into three categories. The first category of patients was (n=30) participants with minor injuries, the second category was of those patients who were with major injuries and third category of patients (n=30) were with major injuries along with imputations. Aim and methodology of the research was described first and then informed agreement was obtained from the individuals. Every participant was approached once shifted from Intensive Care Unit (ICU) to Trauma Ward so that he can get maximum comfort and respond to

psychological questionnaires in face-to-face interaction. Second group of non-injured (n=30) also completed their interviews and questionnaires. They were selected randomly from different clinics that came for non-curative purposes. They did not have any exposure to the bomb blast in the past. Primarily demographic information covering age, marital status, permanent address, education, siblings, parental status, family structure (Nuclear/ joint) and head of family was taken from the patients. Family psychiatric history, substance-abuse history and any past psychiatric history was excluded. Then General Health Questionnaire (GHQ-12), Impact of Event Scale-22(IES-R-22) and Depression, Anxiety and Stress Scale-21 (DAS-21) were completed by the consulted clinical psychologist to eliminate any selection bias.

Objectives

The following were the objective of the study.

- To assess the prevalence of psychiatric morbidity among victims of terrorist attacks
- Posttraumatic stress disorder (PTSD)
- General mental health
- Mood state; state of depression, anxiety, and stress) among three samples (mild injuries, severe injuries & amputation) victims of terrorist attacks in Peshawar, Khyber Pakhtunkhwa
- To study the relationship among variables
- To inspect the arbitrating role of stress, anxiety and depression in the relationship between PTSD and general health.
- To explore the mean group difference on the basis of study variables.
- To develop quick guidelines/ treatment for the patients of PTSD

Instruments: Measures

The following measures were used in this study:

(1) Demographic Information Form
(2) General Health Questioner (GHQ-12)
(3) Impact of Event Revised Scale (IES-R)
(4) Depression, anxiety, Stress Scale (DASS-21)

Demographic Information Form consists of demographic information which focused on the subject's (age, sex, marital status, education, occupation, number of siblings, family structure, birth order, parent's education, and occupation, earning member's, languages etc.), presenting problems, history of problems, psychopathology history, medical, family, school, social / friendship, sexual history, and indications of emotional disorders/behavior disorder. It is qualitative instrument takes 20- 30 minutes to administer.

The DASS is 21 items self-reported scale which aims to measure the negative state of depression, anxiety, and stress (Lovibond & Lovibond, 1995). The DASS was primarily developed by using the 504 student responses taken from 950 university students. These questionnaires were conducted on outpatient groups for validity who suffered from anxiety, depression and numerous other psychological conditions. DASS-21 has been comprehensively normed with the data of 1794 adults (Henrey & Crawford, 2005). DASS-21 has acceptable to excellent ranges internal consistency and concurrent validity with DASS-42. It consists of three subscales: Depression, Anxiety and Stress scale and each subscale have 14 questioner along-with four likely optional answers (a) Did not apply to me at all (0), (b) Applies to me at some degree, or some of the time (1), (c) Applied to me a considerable degree, or a good part of time (2), (d) Applied to me very much or most of the time (3).

Impact of Event Scale-Revised-IES-R (Weiss & Marmar, 1996) is self-rating scale (DSM-IV) with 22 questions. It measures suffering triggered through upsetting situations. This is reviewed type of the previous version (Horowitz, Wilner, & Alvarez, 1979). Participants were asked to recognize a traumatic life incident and further to specify how his stress is affecting them during the last past week. It is a five-point rating scale that ranges from 0 to 4 (not at all-extremely). IES-R depicts a entire score extending from 0 to 88 and its subscales can also be intended for the three subscales.

General Health Questionnaire; GHQ-12 (Goldberg, 1978) is a self-conducted measure, developed to assess a person's mental well-being. It was established as a screening instrument to measure psychiatric disorders, and also measures common mental health issues e.g., anxiety, somatic symptoms, and social dysfunction. This is easy to administer and requires less than 7 minutes to complete. The GHQ contains many types by using 12, 28, 30 and 60 items scale and is widely used by the health professional in the globe. Its scoring consists up of 4-point ordinal scale (0 to 3). Higher scores are indicative of more suffering.

Hypotheses

- There was a positive association of PTSD with stress, anxiety & depression whereas negative association with general health.

- PTSD, stress, anxiety, and depression would be more in amputated and severe injuries participants as compared to other group.
- Amputated participants would have lower general health as compared to other group.
- Participants from nuclear family would have more PTSD, stress, anxiety and depression and lower general health as compared to second group.

Results

Table I
Demographic Characteristics of the Participants (*N* = 120)

Variables	F	%	M	SD
Age			30.39	8.15
Group Belongs				
Normal individual	30	25		
With Minor Injury	15	12.5		
With Mild Injury	15	12.5		
With Severe Injury	15	25		
Amputated	30	25		
Marital Status				
Single	37	30.8		
Married	83	69.2		
Education				
Under matric	8	6.7		
Matric	66	55.0		
Intermediate	38	31.7		
Graduation	5	4.2		
Master	2	1.7		
Family Structure				
Nuclear	49	40.8		
Joint	71	59.2		

Table I demonstrates the mean and standard deviation of participants' age. This table also showed frequencies and percentages of the demographic attributes of the sample of study. It depicts participants' group belonging, ranks, marital status, educational qualification, and family system of victim of terrorists' attack.

Table II
Psychometric properties for scales used in study (*N* = 120)

Scale	K	A	M	SD	Range		Skew	Kurt
					Actual	Potential		
IES-R	22	.99	20.95	23.64	00-88	00-83	0.99	-0.32
DASS	21	.98	13.13	14.44	00-63	00-44	0.82	-0.69
GHQ	12	.96	11.09	7.47	00-36	00-31	0.21	-0.29

Note: IES-R = Impact of Event Scale- Revised, DASS = Depression, Anxiety, Stress Scale, GHQ = General Health Questionnaire

Table II shows mean, standard deviation, alpha reliability coefficient, range of potential and actual scores, skewness, and kurtosis. Results showed that the values of skew and kurtosis are within acceptable range. Cronbach alpha reliability coefficient values are above .95, which means that all the scales were highly reliable.

Table III
Descriptive statistics and correlation for main study variables (*N* = 120) variables

Variables	*M*	SD	1	2	3
1. IES-R	20.95	23.64	-	.90***	-.71***
2. DASS	13.13	14.44	-		-.78***
3. GHQ	11.09	7.47		-	

Note: IES-R = Impact of Event Scale Revised, DASS = Depression, Anxiety, Stress Scale, GHQ = General Health Questionnaire. ***$p < .001$.

Table III revealed the patterns of relationship among the study variables, and it is evident that all the relationship's patterns are in the desired directions. Results showed that Impact of a negative event had considerable positive relationship with depression, anxiety and stress. Whereas it had a substantial undesirable association with overall health as well. Same as Depression, anxiety and stress had significant negative relationship with general health.

Table IV
Regression analysis for mediation of depression, anxiety and stress between negative impact event and general health (*N* = 120)

Variable	B	95% CI	SE	B	B	R^2	R^2
Step 1						.51	.51***
Constant	6.37***	[5.10, 7.64]	6.42				
IAS-R	.23***	[.19, .27]	.02	-.71***			
Step 2						.61	.10***
Constant	5.77***	[4.61, 6.92]	.59				
IAS-R	.20**	[-.06, .10]	.04	-.06			
DASS	.38***	[.24, .51]	.07	-.73***			

Note. IES-R = Impact of Event Scale Revised, DASS = The Depression, Anxiety and Stress Scale, GHQ = General Health Questionnaire, CI = Confidence Interval. ***p < .001

Table IV shows the impact of negative event and depression, anxiety and stress on General Health in survival victims of terrorist's attack. In Step 1, the R^2 value of .21 revealed that the negative event impact explained 51% variance in the General health with F (1,118) = 122.61, p < .001. The findings revealed that Impact of Negative Event negatively predicted General Health (β = -.71, p < .001). In Step 2, the R^2 value of .61 revealed that the Event impact and Depression, anxiety and stress explained 61 variances in the General Health with F (2, 117) = 91.53, p < .001. The findings revealed that Event Impact (β = -.06, p > .05) non-significant and Depression, anxiety, and stress (β = -.73, p < .001) significant negatively predicted General health. The ΔR2 value of .10 revealed 10% change in the variances of model 1 and model 2 with ΔF (1, 117) = 30.16, p < .001. The regression weights for Event's impact subsequently reduced from model 1 to model 2 (-.71 to -.06) and became non-significant which confirms the full mediation. That means, event impact had indirect effect on General health through depression, anxiety, and stress.

One-way Analysis of Variance (ANOVA) was conducted to analyze the group mean differences on study variables with reference to group belonging of the participants

Table V
Mean difference across Group belonging of participants on study variables (*N* = 120)

	Group Belongs											
Variable	Normal (*n* = 30)		Mild Injury (*n* = 15)		Minor Injury (*n* = 15)		Severe Injury (*n* = 30)		Amputation (*n* = 30)			
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F* (4,115)	η2
IES-R	0.30	0.70	5.20	5.71	5.60	3.94	22.20	8.68	55.90	15.41	167.11**	.85
DASS	0.33	1.47	4.60	5.12	5.00	5.08	15.50	9.74	31.87	11.11	71.40**	.71
GHQ	3.83	5.17	7.60	5.05	11.53	3.80	12.13	5.06	18.83	5.75	3407**	.54

Note. IES-R = Impact of Event Scale Revised, DASS = The Depression, Anxiety and Stress Scale, GHQ = General Health Questionnaire.

Significant mean differences were observed on all the variables as shown in Table V. It was found that amputated participants were most affected by the trauma by showing high score on impact of event scale, depression anxiety and stress scale and general health questionnaire as compared to other groups followed by severe injury, minor injury, and mild injury respectively.

Independent sample t test was run to find out mean differences across family system of participants in relation to Impact of event, Depression, anxiety and stress and their general health affected.

Table VI
Mean differences across family system of participants on study variables (*N* = 120)

Variables	Joint FS (*n* = 49)		Nuclear FS (*n* = 71)				
	M	*SD*	*M*	*SD*	*t* (118)	*p*	Cohen`s d
IES-R	17.51	20.28	23.37	25.58	-1.34	.18	-.25
DASS	11.20	12.36	14.45	15.67	-1.21	.29	-.23
GHQ	11.14	7.10	11.06	7.75	.62	.95	.01

Note. IES-R = Impact of Event Scale Revised, DASS = The Depression, Anxiety and Stress Scale, GHQ = General Health Questionnaire

Results showed in Table VI that there were non-significant differences on all the scales between these two groups.

It was hypothesized that Impact of an event will affect more to the participants belongs to nuclear family as compared to joint family structure whereas results were quite different, there were no substantial changes among two groups.

Independent sample *t* test also was run to find out mean differences across marital status of participants in relation to Impact of event, Depression, anxiety and stress and their general health affected.

Result showed in the Table VII that there were no significant differences on all the scales between these two groups

Table VII
Mean differences across marital status of participants on study variables (*N* = 120)

Variables	Unmarried (*n* = 49)		Married (*n* = 71)				
	M	*SD*	*M*	*SD*	*t* (118)	*p*	Cohen`s d
IES-R	15.76	22.16	23.27	24.04	-1.62	.11	-.32
DASS	11.03	12.57	14.06	15.18	-1.06	.29	-.21
GHQ	10.32	7.77	11.43	7.35	-.75	.45	.15

Note. IES-R = Impact of Event Scale Revised, DASS = The Depression, Anxiety and Stress Scale, GHQ = General Health Questionnaire.

Discussion

The results of study are persistent with the evidence that after terrorist bomb attacks there is significant burden of variety of mental disorders (Galea et al., 2002) and individuals injured by disasters have high rates of post-event psychiatric issues than persons (Norris et al., 2002; North et al., 1999; North et al., 2002 & Genjian, 2001) who did not expose to bomb blast.

Our results showed that patients with severe physical injuries and amputation due to terrorist attacks presented higher rate of psychiatric morbidity it was also well recognized in literature. According to research analysis frequency of psychological illnesses was 57.5% between injured, major depression was 31.5% (95% CL, 23.5-40.3) among injured, agora phobia was 23.8% among injured, GAD was 13.4% among injured, panic disorder was 9.4% among the injured, comorbid disorders anxiety and depressive disorders were 52.8% among injured and most comorbid disorders were PTSD and depression (Gabrial et al., 2006). Another research concluded the same findings that the severity of the symptoms of anxiety disorders, Major Depressive Disorder (MDD) worsens in those individuals who were exposed to bomb blast (Glad et al., 2017). High rate of anxiety disorder was found in physically injured individuals than the general population (Jam et al., 2010; Zhang et al., 2016). High prevalence of PTSD (30%) was found in directly exposed to terrorist attacks (Paz Garcia-Vera et al., 2016), even after 14-15 years of attack it was 4.1% (Adams et al., 2019). Research conducted after the bomb blast of 14-15 years concluded that Major Depressive Disorder (MDD) was 6.8% alone, whereas 8.9% had comorbid MDD and PTSD (Jacobson et al., 2018 &Adams et al., 2019) and 68.2 % also had comorbid MDD (Adams et al., 2019). Explanation can vary in its nature because sample population was salaried persons who were worried about safety of their future, secondly amputation and sever injuries resulted into prolong admission in the hospital and further may develop dependency on relatives, other people and doctors.

Patients with mild physical injuries due to terrorist attacks presented low scores on PTSD and depression, anxiety & stress and general health scale as compared to severely injured and amputation patients as we speculated. Possible reasons may include rapid recovery from the hospital, less pain and good support by their organization as all sample were salary persons. However, shockingly literature does not fully support our hypothesis. It depicted a lot of variation as documented in many studies. Research (North et al., 20015) analyzed those persons who stayed even in the locality of bombs attacks, reported 26% symptoms of Major Depressive Disorder and rates of MDD were typed amongst rescue workers 15.3% after 10-15 years of attacks (Jordon et al., 2019) 17.2% in non-traditional rescue employees respectively. PTSD was found reasonably high in volunteers (Jacobson et al., 2018; Jam st al., 2013; Horn et al., 2016) after the attack of 5-7 years. PTSD in direct victims was found 15-26% even 6-7 years of attack (Paz Garcia-Vera et al., 2016). Even in relief workers PTSD was found very high 21.9% (Chen et al., 2020) and in close relatives it was found 23% of the sufferers who were incapacitated in bomb blasts (Paz Garcia-Vera et al., 2016).

We also hypnotized that PTSD would be first and depression would be second most common disorders reported by the three groups of patients because our sample was restricted to injured persons because deaths and injuries were frequent due to terrorist attacks in Peshawar region and surrounding area. Researchers also pointed out that depression was most significantly reported mental disorder after PTSD (Zhang et al., 2016). On the other hand, severity of symptoms on scale was not high and sample reported under-reported psychological symptoms. There may be two possible reasons that in combined military hospital majority of the patients were trained soldiers, policemen and law enforcement forces persons who are well trained for such emergency situations. Secondly sample had previous participation in the terrorist operations.

Our last hypothesis was that; participants from nuclear family would have more PTSD, stress, anxiety and depression and lower general health as compared to other group. One of the possible reasons was that data collected right after the shifting of patients from

ICU to trauma ward, where nursing care and the social support system was already present. Moreover, these participants were already first line workers who were mentally prepared for such incidents. High level of role clarity and predictability may be another factor in this concern.

Theoretical and Applied Significance of the Present Study

Current research will provide guidelines and awareness for the victims of terrorist attacks in the light of local culture. It will offer baseline evidence for policy makers to establish a well-equipped psychological rehabilitation facility for victims of terrorist attacks. All mental health professionals who are serving in civil hospitals and military hospitals will benefit from the findings of the research. Quick psychological response centers may be established in community hospital where well-trained psychologist rehabilitates victims of terrorist attacks. Finally, this facility will become bridge between medical doctors and mental health professional to work together and resolve the metal trauma of victims during terrorist attack which is still need of our culture.

Limitations and Suggestions for Future Research

Current study is cross-sectional design and with this design, it may not be analyzed whether the relationship patterns among the study variables will change over a period of time. In this concern longitudinal design would be appropriate for exploring possibility of changes in relationships between the study variables due to temporal factor. Future researches should include the temporal factor with reference to stress, anxiety, depression and post-traumatic growth and carry out longitudinal researches.

Another limitation included was that only admitted patients with one week admission was considered, however if the data was taken after few weeks, then results may have more revealing results. Data was only limited to injured persons who was treated in the main hospitals and patients who were taken to small hospitals were not approached. Participation of major bulk of patients may be included to get better results for the future findings. Quantitative approach has been used in this study to investigate relationship among study variables. For future researchers' qualitative approach can be an interesting way of exploring these relationships in the local context.

Conclusion

This research aimed to address emergency situations including victims of terrorist attacks who are psychologically mal-treated by the hospitals. With the healing of injuries and wounds, psychological trauma of victims required immediate attention and treatment. Hence providing trauma facilitation for the patients with terrorist attacks is as necessary as treating physical trauma.

This study has supported the evidence that after terrorist bomb attacks there is significant burden of variety of mental disorders and individuals injured by disasters have high rates of post-event psychiatric issues than persons, who did not expose to bomb blast. Finding revealed that patients with severe physical injuries and amputation due to terrorist attacks presented higher rate of psychiatric morbidity, anxiety disorders and Major Depressive Disorder (MDD) as compared to individuals with mild/ minor injuries or normal individuals. Findings also revealed that participants from nuclear family would have more PTSD, stress, anxiety and depression and lower general health as compared to other group.

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