

## Impact of terrorism on health and Hospital Anxiety Depression Scale Screening in medical students, Karachi, Pakistan

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### Abstract

**Objectives:** To determine the association of terrorism with psychiatric morbidity by Hospital Anxiety Depression scale among medical students in Karachi, Pakistan.

**Methods:** The questionnaire based cross-sectional survey was conducted from February to March 2011 and comprised students of the Institute of Physical and Medical Rehabilitation and the Dow Medical College, Dow University of Health Sciences, Karachi. The study tool was a validated Hospital Anxiety Depression scale questionnaire. The data was analysed on SPSS 16. Factor analysis was performed to check which factors had the most influence.

**Results:** Overall there were 1036 respondents. The impact of terrorism on physical, social and mental health was 40(3.9%), 178(17.2%) and 818 (79%) respectively. There was an association of terrorism in 980 (84.6%) respondents with psychiatric morbidity.

**Conclusion:** There was an association of terrorism with psychiatric morbidity in majority of respondents. The significant risk factors were age, gender, physical, mental and social health and the desire to live in Pakistan.

**Keywords:** Impact, Terrorism, Physical, Mental and social health, Medical students, HAD scale, Psychiatric morbidity. (JPMA 64: 275; 2014)

### Introduction

There is no single, universally accepted definition of terrorism. Terrorism has a long history and several forms. Terrorism does not simply equal trauma. In general, the systematic use of violence and coercion to achieve some goal is taken as terrorism. Internationally, terrorism is defined as "the unlawful use of force and violence against persons or property to threaten or coerce a government, the civilian population, or any segment of political or social objectives".<sup>1</sup>

In addition to the loss of life, terrorism has affected the behaviour and psychological responses in humans. These psychobiological effects include physical and mental trauma.<sup>2</sup> Currently some parts have been more affected by terrorism in the world, such as Pakistan. All walks of life have been affected, including the general population in various provinces of the country.<sup>3</sup> Major cities in the country have been targeted. Men, women, children have lost their lives or have suffered mental, physical and social trauma which have affected their daily life and personality permanently. Any activity is now wrought with

underlying tension of an unknown terrorist attack.

The students have suffered in terms of their education, as schools, colleges and universities have been frequently closed due to the threat of terrorist attacks. Following these attacks the educational syllabus then has to be covered in a shorter duration of time and sometimes the educational institutions are opened on holidays, such as weekends to complete the curriculum in time. This has upset the routine of all students, their family life and social network. The tradition and culture of families in Pakistan is important for the development of the younger generations' social and mental well-being, which may be adversely affected due to the long-term effects of terrorism. The parents are worried on a daily basis if and when to send their children to educational institutions. Socially also, these students are not able to enjoy or relax, due to the potential threat of terrorism. Their education may seriously be jeopardised. The effect on these youngsters which comprise 55 million of our population<sup>4</sup> cannot be imagined. Hence, we decided to determine the status of physical, mental, social health and the anxiety and depression level by Hospital Anxiety Depression (HAD) scale through Urdu version<sup>5</sup> after terrorist events among medical students in Pakistan.

### Subjects and Methods

The questionnaire-based survey was conducted from February to March 2011 among students of the Institute

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of Physical and Medical Rehabilitation and Dow Medical College, Dow University of Health Sciences (DUHS), Karachi, Pakistan. The ethical approval of the study was obtained from the DUHS Institutional Review Board. Students were recruited on a voluntary basis after informed consent. The responses received were measured on HAD scale. The impact of terrorism on physical, mental and social health was assessed by indicators based on the World Health Organisation (WHO) health definition and the opinion of medical students. A semi-structured validated questionnaire was developed and all responses were recorded. The sampling technique used was simple random. Based on Gillespie, Dolberg and Schindel-Allon studies<sup>6-8</sup> the sample size was calculated through OpenEpi, Version 3, open source calculator-SSPropor.

The impact of terrorism was assessed by self-reporting of the students regarding the direct impact of terrorism on their physical, mental and social status. The health status was screened by the HAD scale to grade the level of anxiety and depression. The social and mental status was judged by grades from mild, moderate to severe effects. The overall impact of terrorism was assessed by the "direct effect" on the students. The female:male ratio was large in the university; therefore the social impairment and anxiety/depression level was stratified by gender.

A quantitative observation was made to determine how many students had witnessed a terrorist act. Therefore, they were asked, have you ever witnessed any terrorist incidence in the last 10 years? The question was asked to recall the incidence from the time of interview back to the preceding 10 years if they could recall easily and remember the terrorist attack. The question was focused to determine the long-term effect of terrorism on their memories. If there was a discrepancy in the dates of terrorist attack or they could not recall the incidence occurred, the response was taken as negative.

The terrorism factor analysis was performed to determine the most influencing factor on health, social and mental status of medical students. The factor analysis included extremism, religious misconception, politics, poor education, income, inflation, un-employment and corruption directly affecting students' lives due to terrorism.

Mild social morbidity was taken as limitation of activities for only emergency purposes. Moderate social impairment also included limitation of social activities within the house. Severe health indicators included no social movement in the university and the house. All responses were analysed using SPSS 15. The age was reported as mean  $\pm$  standard deviation. For qualitative

variables like frequency of health impairment, impact of terrorism on social and physical activities, effect on education, causes of terrorism from students' perspective were presented as frequency and percentages. The stratification was done for gender to see the effects of these on their academic outcome. Chi-square test was used to compare the qualitative variables and independent sample t-test to compare the quantitative variables at 5% level of significance.

Cronbach's alpha was used to determine the measure of internal consistency. The survey/questionnaire had multiple Likert type questions to determine the reliability of the scale. A 14-item questionnaire was used to determine the reliability. Factor analysis was performed to check which factors were most influenced in our study. All the factors with eigen values more than one were extracted. Questions with factor loading more than 0.15 were kept to form the factors.<sup>9</sup>

## Results

Of the 1500 questionnaires distributed, 1036 (69%) were returned duly filled. The mean age of the respondents was  $20.63 \pm 1.69$  years. The female participants were 907(87.5%). The impact of terrorism on rating scale was immense on physical 40(3.9%), social 178(17.2%) and mental health 818 (79%) (Table-1). The HAD scale on assessment showed 56(5.4%) respondents were healthy and 980 (84.6%) had psychiatric morbidity.

Overall, 571 (55%) respondents had social morbidity (Table-2). In terms of mental status, mild 457 (44.1%), moderate 275 (26.5%) and severe morbidity 304 (29.3%) was noted.

Of the total, 724 (69.90) said they had been affected

**Table-1:** Characteristics.

Respondent Characteristics	Number	Percentage
Mean Age Range:		20.63 $\pm$ 1.69
18.00 -21 Years	741	71.5
22.01 -25 Years	279	26.9
26.00 -29 Years	16	1.5
<b>Gender</b>		
Male	129	12.5
Female	907	87.5
<b>Frequency of Impairment in Health Status</b>		
Physical Health	40	3.9
Social Health	178	17.2
Mental Health	818	79
<b>Assessment of mental health based on HAD Scale</b>		
Healthy	56	5.4
Psychiatric morbidity	980	94.6

HAD: Hospital Anxiety Depression. SD: Standard Deviation.

**Table-2:** Impact of Terrorism.

Impact of terrorism on medical students	Number	Percentage
<b>The Rate of most common impact on scale of health</b>		
<b>Social</b>		
Mild	368	35.5
Moderate	571	55.1
Severe	97	9.4
<b>Mental</b>		
Mild	457	44.1
Moderate	275	26.5
Severe	304	29.3
<b>Have you been affected by terrorism?</b>		
Yes	724	69.9
No	310	29.9
<b>Do you think terrorism has affected your life?</b>		
Yes	814	78.6
No	219	21.2
<b>Have you ever witnessed any terrorist incidence in Last 10 years?</b>		
Yes	404	39
No	632	61
<b>Does terrorism have affected your daily life?</b>		
Yes	720	69.5
No	284	27.4
<b>Have you accepted terrorism as a part of life?</b>		
Yes	695	67.1
No	341	32.9
<b>Do you believe your academic progress is affected by terrorism?</b>		
Yes	811	78.3
No	225	21.7
<b>Do you think terrorism is rightly associated with Pakistan?</b>		
Yes	503	48.6
No	533	51.4
<b>Do you feel safe going out from your house?</b>		
1. Always	66	6.4
2. Sometimes	105	10.1
3. Mostly	89	8.6
4. Never	768	74.1
5. Not Known	8	0.8
<b>Do you wish to live in Pakistan after graduation?</b>		
Yes	821	79.2
No	215	20.8
<b>Do you think terrorism will end in Pakistan?</b>		
Yes	433	41.8
No	603	58.2
<b>Is there any association of terrorism and Islam?</b>		
Yes	1028	99.22
No	8	0.8

directly by terrorism, while 814 (78.60) said terrorism had affected their daily routine of study and had effected change in social and behavioural attitude in 404 (39%) in the preceding 10 years.

Besides, 695 (67.10%) respondents believed that continuous and unpredictable terrorist attacks had made

**Table-3:** Terrorism and associated risk factors.

S. No	Associated risk factors	Male	Female	Total No (%)
1	Extremism	57 (12.3%)	407 (87.7%)	464 (44.8)
2	Religious misconception	28(11.2%)	221 (88.8%)	249 (24)
3	Politics	29 (17.6%)	136 (82.4%)	165 (15.9)
4	Poor Education	13 (20.6%)	50 (79.4%)	63 (6.1)
5	Income	0 (0%)	8 (100%)	08 (0.8)
6	Inflation	0 (0%)	44 (100%)	44 (4.2)
7	Un-employment	2 (6.3%)	30 (93.8%)	32 (3.1)
8	Corruption	3 (27.3%)	8 (72.7%)	11 (1.1)

**Table-4:** Factor analysis of the questionnaire.

Questions	Rotated Factor Matrix <sup>a</sup>				
	Healthy group	Lazy group	Anxiety group	Worrying group	Depressed group
HA 4	0.863				0.280
HA 7	0.829				
HA 9	0.730				
HA 14	0.639				0.233
HA 12	0.362			0.360	
HA 13		0.825			0.321
HA 8		0.739			
HA 10		0.719			
HA 6		0.505		0.340	
HA 3			0.842		
HA 2					
HA 1			0.185		
HA 5				0.658	
HA 11	0.176				0.534

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

<sup>a</sup>Rotation converged in 6 iterations.

terrorism a part of their lives; 811 (78.30%) responded that academic progress had been affected by the war against terrorism; 503 (48.6%) believed that terrorism had been rightly associated with Pakistan; and 433 (41.8%) thought that it would continue in future in Pakistan; 1028 (99.22%) believed that Islam and terrorism were not associated with any aspect of religion, education and societal norms.

The most common identified risk factor was extremism 464 (44.7%) and religious misconception 249 (24.03) (Table-3). The associations of terrorism with major risk factors based on gender, and age were significantly associated with the impact of terrorism. Females were more affected (88.1%). Overall, significant impacts of all three major statuses were affected in 0.6% medical students. There were 78.2% students who desired to live in Pakistan.

The Cranach's alpha value was 0.510 which was low, indicating need for further research to enhance the reliability of the questionnaire. Most of the healthy respondents stated that they envisioned pleasure and happiness in their lives, felt peace occasionally, but sometimes they were afraid and had palpitation, they enjoy reading books listening radio and watching television and have an interest in new events. Most of the lazy group had sudden feeling of terrorism, laziness, not interested in self-grooming, occasionally happy but mostly felt that something terrible may occur in their life. In factor analysis, the anxiety group responded that they were afraid of some terrible event most of the time and felt mental pressure and burden most of the time. The worrying group students claimed worrying/disturbing thoughts, occasional happiness and few moments to take interest in new events and ideas. The depressed group claimed that mostly they assumed sudden attack of terrorism and few occasions of enjoying books, radio and television (Table-4).

## Discussion

Pakistan is in the frontline of "war against terrorism" since 2001. Since 9/11, continuous terrorist attacks have exposed particularly developing countries to terror and fear, resulting in individuals' health impairment and economic crisis. Since 9/11, continuous terrorist attacks have affected Pakistan.<sup>10</sup> There have been an estimated 35,000 deaths of innocent, poor, common men, women and children in the last 10 years. This also includes 5000 security forces, military, paramilitary and police force in the last ten years. There were 269 suicidal attacks on common places of market, mosque, schools and roads. Unfortunately the first decade of current century has witnessed major events of terrorism globally.<sup>11</sup>

Therefore, the physical, mental and social health in general and particularly among students of medical profession in the universities have generated impact on their lives as they often witness the blast, firing, dacoities, and targeted killings.

The terrorism-related violence affects public health and the healthcare services, leading to psychopathological diseases. The medical students also observe and help in the management of common people and political, social and religious leaders in emergency rooms and wards in the affiliated major teaching public-sector hospital. The medical students doing their trainings also witness the powerless, injured, patients daily in hospitals.<sup>12</sup>

The health consequences include an array of disturbances of cognition, behaviour, emotional, psychological anxiety and depression. Anxiety and post-traumatic depression

have been evidenced from different studies as severe consequences according to the type and intensity of events witnessed or encountered by medical students. The wider impact is based on the nature of events and their consequences which has been a public health problem. Mental health in children had 19 times greater probability of war-related post-traumatic depression.<sup>13</sup> Gillespie found 53% psychiatric morbidity in the terrorism exposed young adult in a community.<sup>6</sup> In our study, institutional based psychiatric morbidity among medical students was 980(94.6%). The most important aspect is that there is no support or rehabilitation plan for their morbidity either at the institution or at home in Pakistan.

Nearly all medical students (99.22%) believed that Islam and terrorism are not associated with any aspect of religion, education and societal norms. The relationship between Islam and terrorism was quantitatively assessed to determine the impact of terrorism in the Islamic republic where peace is mainly affected by bomb blasts, firing and suicidal attacks.

The perspectives of future physicians on disaster medicine and public health preparedness issues have not been included in the curriculum of medical education. The need of support for the future physicians has not been recognised.<sup>14</sup> An adverse effect of an impairment of mental health 818(79%) and social health 178(17.2%) respectively was observed in another study.<sup>15</sup>

The medical ethics included standards of care, justice, equity, informed consent and patient's autonomy. These moral and ethical responsibilities of physicians to care for disaster victims have not been practised and taught to medical students. Therefore, in this study medical students had reservation regarding these ethical issues, and practices of standard of care has been jeopardised in the management of psychiatric morbidity.

One of the main barriers to healthcare preparedness for terrorism in low-resource country is lack of coordination across the spectrum of public health and healthcare communities and disciplines.<sup>16</sup> In our study, 695(67.10%) medical students accepted terrorism as part of their lives; 724 (69%) agreed that it had affected their lives in several ways; 811(78.30%) believed that the academic progress in the form of cognition, development of skills and outcome of their grades had adverse effects. The strategic role for addressing gaps in the preparedness and response among medical students has to be described and implemented at the national level. The comprehensive address to physical, social and mental needs of medical students will limit the adverse consequences, including minimisation of health impact in daily life, empowerment

and focus on education.

Medical school has a very stressful environment with multiple sources of stresses. Therefore, academic and social issues do affect health status of medical students. The higher level of fear and change in daily activities was observed in American compared to Israeli medical students. Cultural factors may affect students' adjustment to the medical school environment.<sup>17</sup> This communication reflects that half of the students believed that terrorism had invaded their health status. Overall, 768(74.1%) accepted that they had a feeling of insecurity while going out of the homes and avoided to take part in any social activities and as such their social exposure had been jeopardised in the previous 10 years seriously.

Research has demonstrated that "trauma centrality" positively correlates with post-traumatic stress disorder (PTSD). Therefore, placing trauma at the centre of one's identity is associated with psychological morbidity.<sup>18</sup> The findings were consistent in our study where the impact of terrorism was scored as mild mental problem 457(44%), moderate 275(26.5%) and severe 304(29.3%) among medical students respectively. Chemtob et al showed that maternal depression and PTSD were associated with increased emotional reactivity with relative risk 5.9.<sup>19</sup>

Dolberg et al. showed that 42% direct affectees of terrorism showed short-term mild post-traumatic depression, while after two years, 35% had full-blown depression with symptoms.<sup>6</sup> The current study after 10 years showed that 29.3% of medical students had severe mental morbidity after terrorism. The war against terrorism is a critical concern for Pakistan. The uncertainty of where and when the next attack might occur introduced anxiety and sickness in young medical students of Pakistan. The unpredictable and catastrophic nature of terrorism has provoked fear leading to a demoralising effect on mental health in Pakistan.

The organised and inter-disciplinary actions that address the physical, mental and environmental health have been the concerns which include mental morbidity and physical injuries in war against terrorism. Brevin et al screened 2005 London bombing affectees to identify mental health needs through Trauma Screening Questions and found it effective.<sup>20,21</sup> The sub-standard, healthcare infrastructure and poor emergency response systems in Pakistan currently are not able to manage terrorism. There have been marked gaps in coordination and dissemination of information and economic support. The evidence-based healthcare services in rural and urban Pakistan need to improve the administrative and supporting role of government and non-governmental

organizations (NGOs) at multiple levels for the pre-event, event and post-event phases of a terrorist attack. The precaution from consequences of terrorist events, particularly in universities, should be on the priority as part of health management. Screening of psychiatric morbidity at the individual level of medical student needs immediate assessment action to be initiated in response to terrorism in Pakistan, particularly at school, college and university levels.

Ghafari et al. found that psychological morbidity was twice more common in adults who have witnessed or have a relative affected by 9/11 attacks. This finding was consistent with our study as half of the students believed that the rise in mental, physical and social morbidity was associated with terrorism in Pakistan.<sup>22,23</sup>

The current situation through these surveys<sup>24,25</sup> in different samples requires having a disaster plan that dictates responses in an emergency. Family and traditions have been seriously affected. Similar effect to psychological trauma has been observed as an impact of disasters in other countries facing problems of terrorism globally.<sup>26</sup> Compton et al found that depression is associated with subsequent performance change.<sup>27</sup> The HAD scale in our study showed that 94% undergraduates had psychological morbidity which is self-rated.

The factor analysis developed five groups. This included healthy, lazy, anxiety, worrying and depressed groups. Most of the healthy respondents have stated that they envisioned pleasure and happiness in their lives, felt peace occasionally, but sometimes they were afraid and had palpitation. They also enjoyed reading books listening to the radio and watching television and had an interest in new events. The anxiety and depressed groups responded that they were afraid of unavoidable sudden terrible terrorist attacks most of the time and felt mental pressure and burden. The depressed group claimed that mostly they expected sudden attack of terrorism and very few occasions of enjoying books, radio and television. The factor analysis showed that mostly the medical students were afraid of some terrorism anytime anywhere.

The study had logistic limitations of collecting data. Drawbacks of the study included a convenience sampling only from a single medical college. However, it is among the most prominent and prestigious government universities of the major city, Karachi of Pakistan where students from all over Karachi on a merit basis join the medical college. So, indirectly it may represent the tension which this young population has to face with respect to terrorism. The study showed that the larger number of female medical students 87.5% had higher

merits compared to males. This is because the admissions were based on open merit.

## Conclusion

HAD scale on assessment showed 84.6% of the respondents had psychiatric morbidity. The significant risk factors associated with terrorism among medical students were age, gender, physical, mental and social health.

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