

Original Research Article

Prevalence of post traumatic stress disorder and its predictors among road traffic accident survivors

Amna Khurshid¹, Yousaf Saleem², Saish Ahmad³, Abdullah Saif Khan³, Kashif Ayoub³,
Muhammad Faisal Shamsher⁴, Tayyab Mumtaz Khan^{5*}, Hamza Ibrahim⁶,
Muhammad Hassan⁶, Muhammad Hassan Ahmad⁶

¹Department of Internal Medicine, Punjab Medical College, Faisalabad, Pakistan

²Department of Internal Medicine, Combined Military Hospital, Lahore, Pakistan

³Department of Internal Medicine, Rahbar Medical and Dental College, Lahore, Pakistan

⁴Department of Internal Medicine, Avicenna Medical College and Hospital, Lahore, Pakistan

⁵Department of Orthopaedic Surgery, Rawalpindi Medical University, Rawalpindi, Pakistan

⁶Department of Internal Medicine, Allama Iqbal Medical College, Lahore, Pakistan

Received: 08 June 2024

Revised: 18 July 2024

Accepted: 23 July 2024

*Correspondence:

Dr. Tayyab Mumtaz Khan,

E-mail: tayyab.mkhan98@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Post-traumatic stress disorder (PTSD) among road traffic accident (RTA) survivors, gets received little attention as medical experts prioritize treating physical injuries. In Pakistan, PTSD remains understudied. Therefore, this study aimed to determine the prevalence and predictors of PTSD.

Methods: This cross-sectional study was performed among 128 survivors of RTA at Benazir Bhutto hospital, Rawalpindi. Data were collected via a pre-tested PTSD checklist-specific version (PCL-S) tool to screen for PTSD and a self-designed proforma. Descriptive and inferential statistics were used in the data analysis using the statistical package for the social sciences (SPSS) version 25. The $p < 0.05$ was used set a significant.

Results: The 34 (26.56%) participants of study population had PTSD. Following adjustment for potential confounding variables, the following factors were found to be significant predictors of PTSD: time since RTA (1-3 months) (AOR=0.38; 95% CI (0.18, 0.76), history of prior RTA (AOR=2.56; 95% CI (1.22, 5.47), presence of close one in the same RTA, (AOR=2.23, 95% CI (1.14, 4.46), witnessing of death of close one in the same RTA, (AOR=7.49, 95% CI (3.16, 14.68) and previous history of psychiatric illness (AOR=12.35, 95% CI (5.32, 28.29).

Conclusions: Our study population had significant prevalence of PTSD (26.56%). Significant predictors of PTSD included the amount of time after the accident, the history of prior traffic accidents, presence of close one in same accident, witnessing the death of close one in same accident, and history of psychiatry disorder.

Keywords: Prevalence, Post traumatic, Stress, Disorder, Predictors, Road, Traffic, Accident, Survivors

INTRODUCTION

Approximately 1.35 million people worldwide lose their lives in traffic accidents each year. Nowadays, road traffic accidents (RTAs) constitute the leading cause of death, mostly for individuals between the ages of 15 and

29. In addition, there are an additional 20 to 50 million nonfatal injury cases, many of which result in disability.¹ RTAs are a major cause of morbidity and mortality in Pakistan. Medical care for RTA-related injuries is frequently directed toward the damage sustained physically, but it's important to also consider the

psychological effects of these incidents.² For survivors of RTAs, there can be severe and enduring bodily and psychological effects. Several studies have demonstrated that participation in RTA may raise an individual's risk for developing various psychiatric conditions, such as anxiety, depression, and PTSD.^{3,4}

One of the most prevalent mental illnesses affecting victims of road accidents is PTSD, which can have detrimental long-term effects if left untreated. For more than a month, survivors of traumatic events who continue to experience acute, upsetting, and fearfully avoided reactions to memories of the disaster, mood changes, a sense of impending danger, disturbed sleep, and hypervigilance are considered to have PTSD.^{5,6}

The frequency of PTSD varies from 6.3% to 58.3%, and among survivors of RTAs, the pooled prevalence of PTSD is almost 22.25%. With a magnitude secondary to RTAs, PTSD is the most common psychiatric morbidity, with rates ranging from 34%, 18%, and 14% over 1, 6, and 12 months, respectively.⁷

In literature, several factors have shown their association with development of PTSD such as age at trauma, gender, marital status, educational level, socioeconomic status, previous history of psychiatry disorders, previous history of RTA, impact of injury, mechanism of injury, duration since RTA, involvement of close ones, and role during RTA.⁸⁻¹⁰

Although various researches all over the world have shown the predictor of PTSD; however, in Pakistan, studies on the PTSD predictors are limited. Therefore, the purpose of this study was to determine the prevalence of PTSD and its predictors in a tertiary care hospital of Rawalpindi, Pakistan.

METHODS

At Benazir Bhutto hospital, Rawalpindi, Pakistan, from June 2022 to June 2023, this cross-sectional descriptive study was carried out to determine the prevalence of PTSD and its determinants in the sample population. The institutional ethics committee (IEC) granted approval for the study to be conducted. Informed consent was acquired, and information was kept private and anonymous. Referrals for consultation were made for patients who met the diagnostic criteria for depression or PTSD and exhibited symptoms.

Sample size determination and sampling procedure

Sample size was calculated by WHO calculator and it was 128. Purposive sampling along with an inclusion and exclusion criteria were used for selection of participants. The study comprised patients who were seen in different departments of the Benazir Bhutto hospital, who were between the ages of 18 and 70 and who had survived RTA at least one month to one year prior to the collection

of data. Excluded from the study were patients who had sustained a head injury in an accident, had other substantial medical or surgical comorbidities (factors that may elevate stress levels among RTA survivors), or were under the influence of the drugs at the time of the interview.

Data collection

An interviewer-administered questionnaire with two primary components was used to collect data. These included the prevalence of PTSD as well as the sociodemographic information (demographic data, accident-related data, and clinical data).

PTSD was evaluated using the PCL-5. It's a 20-item self-report test that matches the DSM-5 PTSD diagnosis criteria. Every item's score falls into one of four categories: not at all (0), somewhat (1), quite (2), quite a bit (3), and highly (4). The tool's overall score, which is 80, is derived from adding the scores of its 20 elements. A threshold score of ≥ 33 was employed to make a tentative diagnosis of PTSD.

The instruments utilized in this study were translated into the native Urdu language and verified for suitability and relevance by professionals in the fields of psychiatry, psychologists, and psychiatric social work. The Urdu translation tool's content validity index yielded a score of 0.82.

Data analysis

SPSS 25.0 was used for the statistical analysis of study variables. The nominal data were displayed as percentages, while the numerical data were presented as mean \pm standard deviation. To determine the link between each variable and the result variable, logistic regression analysis was performed. Initially, the bivariable logistic regression model was used to examine the relationship between each independent variable and PTSD. In order to control confounding variables, independent variables from the bivariable logistic regression model with $p < 0.2$ were included to the multivariable logistic regression model. A $p < 0.05$ was considered statistically significant in multivariable logistic regression, and the strength of relationship was ascertained by calculating an adjusted odds ratio (AOR) with 95% confidence interval. The Hosmer and Lemeshow test were used to determine the model's fitness, and result was 0.75. Tolerance and variance inflation factor (VIF) were used to assess multicollinearity.

RESULTS

Out of 128 participants, 34 (26.56%) participants had PTSD in current study population. Means of age and monthly income in study population were 40.60 with standard deviation of 22.12 years and 70,000 with

standard deviation of 42,000 PKR (Pakistani rupee) respectively.

Table 1 describes that most of the survivors of RTA had age between 18-35 years, male gender, married marital status, secondary education level, monthly income above 100,000 PKR, and were student by occupation.

Table 2 shows that majority of the survivors of RTA had time since RTA between one to three months, passenger role, absence of close one, pedestrian stuck mechanism of injury, during RTA. While most of these had no previous history of RTA, no witnessing of death of close one and

no history of the previous mental disorder during of the RTA.

Table 3 indicates that multivariable logistic regression analysis, after controlling for confounding variables, following factors were significant predictors of PTSD: time since the RTA (1-3 months) (AOR=0.38; 95% CI (0.18, 0.76), history of the prior RTA (AOR=2.56; 95% CI (1.22, 5.47), presence of close one in the same RTA, (AOR=2.23, 95% CI (1.14, 4.46) witnessing of the death of close one in the same RTA, (AOR=7.49, 95% CI (3.16, 14.68) and previous history of psychiatric illness (AOR=12.35, 95% CI (5.32, 28.29).

Table 1: Socio-demographic characteristics of RTA survivors.

Variables	Category	N	Percentage (%)
Age (in year)	18-35	88	68.75
	Above 35	40	31.25
Gender	Male	76	59.37
	Female	52	40.63
Marital status	Single	48	37.50
	Married	80	62.50
Education level	Illiterate	19	14.84
	Primary level	30	23.43
	Secondary level	67	52.34
	Above secondary level	12	9.39
Monthly income (PKR)	Upto 30000	36	28.12
	31000 to 100000	41	32.10
	Above 100000	51	39.88
Occupation	House wife	10	7.81
	Civil servant	12	9.42
	Farmer	22	17.21
	Merchant	28	21.80
	Student	52	40.63
	Other	04	3.13

Table 2: Clinical and accident-related factors among RTA survivors.

Variables	Category	N	Percentage (%)
Time since RTA	1-3 months	85	66.40
	Above 3 months	43	33.60
History of previous RTA	Yes	36	28.13
	No	92	71.87
Role during RTA	Driver	42	32.82
	Passenger	57	44.53
	Pedestrian	29	22.65
Presence of close one in the same RTA	Yes	26	20.31
	No	102	79.69
Witnessed of death of close one in the same RTA	Yes	12	9.40
	No	116	90.60
Mechanism of injury	Motor vehicle collision	29	22.68
	Motorcycle collision	32	25
	Bicycle injury	10	7.82
	Pedestrian stuck	45	35.16
	Other mechanism	12	9.34
Previous history of psychiatric illness	Yes	29	22.66
	No	99	77.34

Table 3: Bivariable and multivariable logistic regression analysis of predictors of PTSD among RTA survivors.

Variables	PTSD		COR (CI 95%)	AOR (CI 95%)	P value
	Yes	No			
Age (in years)					
18-35	22	66	1 (0.32, 2.27)		
Above 35	12	28	RC	RC	-
Gender					
Male	24	52	RC	RC	
Female	10	42	0.77 (0.45, 1.52)		-
Marital status					
Single	15	33	1.10 (0.42, 2.44)		
Married	19	61	RC	RC	-
Education level					
Illiterate	6	13	1.23 (0.49, 3.54)	0.76 (0.18, 4.20)	0.68
Primary level	9	21	1.02 (0.48, 2.21)	0.70 (0.15, 3.28)	0.56
Secondary level	15	52	1.50 (0.68, 3.44)	1.38 (0.36, 5.37)	0.60
Above secondary level	4	8	RC	RC	
Monthly income (in PKR)					
Upto 30000	7	29	0.70 (0.34, 1.46)		
31000 to 100000	10	31	0.81 (0.44, 1.39)		-
Above 100000	17	34	RC	RC	
Occupation					
House wife	6	4	RC	RC	
Civil servant	3	9	0.41 (0.2, 1.14)	0.44 (0.058, 2.68)	0.38
Farmer	8	14	0.78 (0.38, 2.35)	0.89 (0.28, 3.18)	0.80
Merchant	10	18	1.10 (0.40, 3.04)	1.11 (0.28, 4.07)	0.79
Student	6	46	0.32 (0.08, 0.84)	0.39 (0.07, 1.56)	0.23
Other	1	3	0.64 (0.14, 1.08)	0.70 (0.19, 3.12)	0.45
Time since RTA					
1-3 months	23	62	0.18 (0.082, 0.34)	0.38 (0.17, 0.76)	
Above 3 months	11	32	RC	RC	0.005*
History of previous RTA					
Yes	24	12	8.40 (4.42, 15.39)	2.56 (1.22, 5.47)	
No	10	82	RC	RC	0.018*
Role during RTA					
Driver	13	29	RC	RC	
Passenger	14	43	1.56 (0.79, 3.57)	0.70 (0.32, 1.64)	0.52
Pedestrian	7	22	1.02 (0.52, 2.12)	0.66 (0.28, 1.65)	0.40
Presence of close one in the same RTA					
Yes	18	8	7.44 (4.14, 14.25)	2.23 (1.14, 4.46)	
No	16	86	RC	RC	0.020*
Witnessed the death of close one in the same RTA					
Yes	10	2	14.69 (6.26, 28.16)	7.49 (3.16, 14.68)	
No	24	92	RC	RC	0.001*
Mechanism of injury					
Motor vehicle collision	8	21	RC	RC	
Motorcycle collision	10	22	0.38 (0.24, 1.06)	0.38 (0.049, 2.28)	0.48
Bicycle injury	3	7	0.75 (0.40, 2.26)	0.79 (0.26, 3.14)	0.75
Pedestrian stuck	11	34	1.16 (0.42, 3.17)	1.09 (0.24, 4.10)	0.80
Other mechanism	2	10	0.35 (0.07, 0.89)	0.44 (0.08, 1.44)	0.28
Previous history of psychiatric illness					
Yes	20	9	22.10 (12.52, 50.24)	12.35 (5.32, 28.29)	0.002*
No	14	85	RC	RC	

*P value<0.05 (variables significantly associated with PTSD), abbreviations-COR=crudes odds ratio, AOR=adjusted odds ratio, CI=confidence interval.

DISCUSSION

This present study has provided significant data about the prevalence of PTSD and its predictors among the survivors of RTAs in a tertiary care hospital of Rawalpindi, Pakistan.

The prevalence of PTSD in our population was 26.56%. Some studies have reported similar prevalence of PTSD among RTAs survivors while other showed lower or higher frequencies of PTSD among their study populations as in South Eastern Nigeria 26.70%, Germany 18.40%, Iran 19.20%, Ethiopia 22.80%, UK 29.10%, India 32.40%, USA 51%, and in Taiwan 82.20%.^{1,3,11,12} The reason for the variation could be due to differences in the socioeconomic and geographical makeup of the study location, variation in sample size, and differences in the usage of techniques used to assess PTSD.

First it was observed that RTAs prevalence was higher among the participants who had age between 18-35 years, male gender, married marital status, secondary education level, monthly income above 100,000 PKR, and who were student by occupation. Higher frequency of RTAs among the younger population, male gender, and married marital status were also presented in a study that was conducted in India.¹ Similarly, it was also noted in a study from Southern Ethiopia that among people with secondary education and upper middle-class status, and who were student by occupation, RTAs were more prevalent.³

In the next step of data analysis, it was noticed that most of the survivors of RTA who presented for their PTSD evaluation, had time since RTA between 1-3 months, passenger role, absence of close one, pedestrian stuck mechanism of injury, during RTA. Alike findings have been presented in various researches that have been conducted in different parts of the world.^{1,9,10}

Following were the significant predictors of PTSD among RTAs survivors in current study; time since RTA (1-3 months), history of prior RTA, presence of close one in the same RTA, witnessing of death of close one in the same RTA, and previous history of psychiatric illness. A systemic review and meta-analysis also supported similar time duration since RTA as a significant predictor of PTSD. One probable explanation is the illness's gradual reduction over time. This is because the degree of stress reduces over time and reduced the risk of getting PTSD.¹³

Many studies in literature endorsed the current study's finding about the significant role of previous history of RTA in the development of PTSD. As those who have been involved in a past traffic collision are more likely to develop PTSD as extra stress of the trauma can have a cumulative effect, and a new traumatic experience might worsen the harmful effects of past trauma.³

Presence of close ones or death close ones in similar RTA was also described as significant risk factor of PTSD among RTA survivors. Involvement of close one could cause the cumulative stress among survivors. Therefore, this leads to PTSD among RTA survivors significantly.⁹

Similar to present study, several studies have also reported that previous mental illness history also predisposes the RTAs survivors towards PTSD. This could be because having other psychiatric diseases increases the chance of acquiring PTSD and other mental illnesses, resulting in worse functional status and a lower quality of life. Furthermore, concomitant mental illness may interfere with a person's ability to completely process the impact of the traumatic incident and their emotions about it, impeding the recovery process.^{5,6}

In light of the foregoing, the current study proposes that emergency departments should screen RTA survivors for PTSD and offer them with the necessary psychosocial therapy in addition to physical injury treatment.

This study has some limitations, including a small sample size, a short follow-up period, and a single-centered orientated design. Because of these limitations, present study findings may be biased. As a result, further studies with larger sample sizes, longer follow-up periods, and a multiple-centered approach are necessary.

CONCLUSION

The current study has revealed a considerable prevalence of PTSD (26.56%). The length of time following the accident, prior traffic accidents, the presence of a close relative in the same accident, seeing the death of a close relative in the same accident, and a history of psychiatric condition were all significant predictors of PTSD. The emergency department should examine RTA survivors for PTSD and provide them with the required psychosocial therapy in addition to physical damage treatment. This could lower the burden of future mental disorders among the survivors of RTA.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Arora D, Belsiyal CX, Rawat VS. Prevalence and determinants of posttraumatic stress disorder and depression among survivors of motor vehicle accidents from a hilly Indian state. *Indian J Psychiatr*. 2021;63(3):250-7.
2. Tanveer U, Liaquat N, Anwar T, Ambreen H. Post-Traumatic Stress Disorder and Its Correlates among Road Traffic Accident Victims. *Pak-Euro J Med Life Sci*. 2023;6(1):01-8.

3. Bedaso A, Kediro G, Ebrahim J, Tadesse F, Mekonnen S, Gobena N, et al. Prevalence and determinants of post-traumatic stress disorder among road traffic accident survivors: a prospective survey at selected hospitals in southern Ethiopia. *BMC Emergency Med*. 2020;20(1):52.
4. Alanazi SE, Anjum I, Almohna AS, Alfawzan HM, Albugami SM, Almutairi MN. Prevalence of post-traumatic stress disorder after road traffic accident at King Abdulaziz Medical City, Riyadh. *IJMDC*. 2021;5(12):2023-6
5. Yimer GM, Adem YF, Haile Y. Determinants of post-traumatic stress disorder among survivors of road traffic accidents in dessie comprehensive specialized hospital North-East Ethiopia. *BMC Psychiatr*. 2023;23(1):218.
6. Khodadadi-Hassankiadeh N, Nayeri ND, Shahsavari H, Yousefzadeh-Chabok S, Haghani H. Predictors of post-traumatic stress disorder among victims of serious motor vehicle accidents. *Int J Community Based Nursing Midwifery*. 2017;5(4):355.
7. Shalev A, Liberzon I, Marmar C. Post-traumatic stress disorder. *N Eng J Med*. 2017;376(25):2459-69.
8. Mosaku K, Akinyoola A, Olasinde A, Orekha O. Predictors of posttraumatic stress in patients admitted to a trauma unit following road traffic accident (RTA). *J Psychiatry*. 2014;1000121(2).
9. Joseph NM, Benedick A, Flanagan CD, Breslin MA, Simpson M, Ragone C, Kalina M, Hendrickson SB, Vallier HA. Prevalence of posttraumatic stress disorder in acute trauma patients. *OTA Int*. 2020;3(1):e056.
10. Diamond PR, Airdrie JN, Hiller R, Fraser A, Hiscox LV, Hamilton-Giachritsis C, et al. Change in prevalence of post-traumatic stress disorder in the two years following trauma: a meta-analytic study. *Eur J Psychotraumatol*. 2022;13(1):2066456.
11. Iteke O, Bakare MO, Agomoh AO, Uwakwe R, Onwukwe JU. Road traffic accidents and posttraumatic stress disorder in an orthopedic setting in south-eastern Nigeria: a controlled study. *Scandinavian J Trauma Resuscitation Emergency Med*. 2011;19:1-6.
12. Sadat Z, Abdi M, Aghajani M. Prevalence of posttraumatic stress disorder and related factors among patients discharged from critical care units in Kashan, Iran. *Arch Trauma Res*. 2015;4(4):e28466.
13. Hoskins M, Pearce J, Bethell A, Dankova L, Barbui C, Tol WA, et al. Pharmacotherapy for post-traumatic stress disorder: systematic review and meta-analysis. *Brit J Psychiatr*. 2015;206(2):93-100.

Cite this article as: Khurshid A, Saleem Y, Ahmad S, Khan AS, Ayoub K, Shamsher MF, et al. Prevalence of posttraumatic stress disorder and its predictors among road traffic accident survivors. *Int J Community Med Public Health* 2024;11:3011-6.