

Post Traumatic Stress Disorder among Road Traffic Accident Victims

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Abstract:

A road traffic accident can produce traumatic stress with tremendous social, physical and psychological consequences to the victims. This cross-sectional study was conducted among 202 road traffic accident (RTA) victims at the in-patient department of National Institute of Traumatology and Orthopedics Rehabilitation (NITOR) during the period January to December, 2013. The study was conducted to assess the level of Post-Traumatic Stress Disorder (PTSD) among the road traffic accidents victims. Data were collected by face-to-face interview and reviewing medical documents by using a semi-structured questionnaire and a checklist respectively. In the study, majorities (73.3%) of the victims were male and rests (26.7%) were females. Mean (\pm SD) age of the RTA victims was 37.69(\pm 13.236) years and majorities (57.4%) were in the age group 18-30 years. Average monthly family income of the victims was Tk.18099.01 (\pm 12406.069) and majority (44.1%) had income TK 5000-10000. Majority (31.7%) of the victims had primary education and 24.8% were illiterate. Majorities (56.4%) of the patients were living in semi-pucca houses and majorities (21.3%) of them were motor workers. Majority (57.9%) of

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patients came from single family and most (90.1%) of them were Muslim and married (74.8%). Majority (42.6%) of the accidents occurred in highways and by auto bike (32.2%). Most (52.0%) of the accidents occurred by face to face collision of the vehicles. Majority (77.2%) of patients experienced severe injuries and 41.1% victims developed PTSD. Female (48.1%) developed more PTSD than their counter part males (38.5%). By age, majority (49.1%) of the younger patients (18-30 years) developed PTSD than the older patients (21.1%) and this differences was statistically significant [$\chi^2_{(2)}=8.141, p=0.017$]. By occupation, development of PTSD was significantly higher in day laborer (71.4%) than other occupation. Majority (70.0%) of the truck accident victims developed PTSD while 23.1% of bicycle accidents victims developed PTSD and this differences was statistically significant [$\chi^2_{(5)}=17.452, p=0.004$]. Majority (51.2%) of highway accidents victims developed PTSD while 30.2% of intersection of road accidents victims developed PTSD and this differences was statistically significant [$\chi^2_{(2)}=6.602, p=0.037$]. Development of PTSD was significantly higher among those victims who suffered more duration (121-210days) following accident than others. To reduce the PTSD of road traffic accidents victims, effective measures like psychological support, motivational assistance, mental health services and rehabilitation services should be provided.

Key words: Road traffic accident (RTA), Post-Traumatic Stress Disorder (PTSD), Road traffic accidents victims

INTRODUCTION

Road traffic injuries are a growing public health and development problem. It was the 11th leading cause of death worldwide and accounted for 2.1% of all deaths globally. Furthermore, these road traffic deaths accounted for 23% of all injury deaths worldwide .90% of road traffic deaths occurred in low income and middle-income countries, where 5098 million people or 81% of the world's population live and own about 20% of the world's vehicles. The WHO African Region had the highest mortality rate, with 28.3 deaths per 100 000

population. This was followed closely by the low-income and middle-income countries of the WHO Eastern Mediterranean Region, at 26.4 per 100 000 population. Countries in the WHO Western Pacific Region and the WHO South-East Asia Region accounted for more than half of all road traffic deaths in the world. (Blanchard ,EB., et al. 1997)

Data provided by the World Health Organization (WHO) and the World Bank were used for the statistical analyses that form the basis of the World report on road traffic injury prevention. In summary, these data showed that, in 2002:1.2 million people died as a result of road traffic collisions. This means that on average 3242 people were killed daily on the world's roads.20 million to 50 million people were injured or disabled in road collisions.

Post-traumatic stress disorder is a psychological disorder which develops following exposure to trauma and is diagnosed only after four weeks have elapsed. The characteristics features are persistent re-experiencing of the event, avoidance of stimuli associated with the trauma and symptoms of increased arousal. Its prevalence in the general population is around 1% and risk factor for developing it includes pre-existing psychological morbidity. (Green, MM., et al.1993)

Road traffic injuries are a critical public health problem in low-and middle-income countries. In 1998 they accounted for more than 85% of all deaths due to road traffic injuries worldwide (Krug, 1999). The number of children killed in traffic crashes in developing countries, estimated at 240,000 a year, exceeds by a factor of 24 the number killed in high-income countries, estimated at 10,000 (UNICEF,2001). However, the data on traffic crashes, injuries, and deaths, mostly derived from police reports, do not provide the complete picture of the burden of road traffic injuries in developing countries.(Brom, D., et al.1993)

Post traumatic stress disorder is among the most frequent and debilitating complication after the road traffic accident. Patient suffering from road traffic accident may also loss their main job and to pay for medical, surgical, psychological and rehabilitation care. Many may also suffer from delirium, depression, anxiety, post traumatic stress disorder (PTSD) and suffer from the loss of their normal activity. Road traffic accident is more strongly associated with Post Traumatic Stress Disorder (PTSD) symptoms and psychological variables.(Sadeghi-Bazargani ,H .,et al. 2011)

Road traffic accidents are also a major health problem in many areas in Bangladesh. There are no adequate researches or published literature on the psychological aspects of road traffic accidents victims in Bangladesh, and investigation of its psychological risk factors and sequels have been neglected. Even the studies of self –immolation are limited to epidemiology and geographical distribution rather than its psychological aspects The aim of this study was to investigate the incidence and predictors of PTSD after road traffic accidents in victims admitted to the National Institute Traumatology and Orthopedics Rehabilitation (NITOR).

Road traffic injuries are one of the leading causes of death, and a major cause of years lived with disability. The incidence is much higher in developing countries due to faulty designing roads, inappropriate or excessive speed in the vehicles and lack of law. Far more than women than men are injured and young children and elderly persons constitute other risk groups. There is a higher incidence of pre morbid psychopathology (e.g. Post Traumatic Stress Disorder (PTSD), depression anxiety)in road traffic accidents victims compared to the general population. Following a road traffic accidents several psychological problems can arise, including generalized anxiety, depression, and Post Traumatic Stress Disorder (PTSD).Symptoms of PTSD are the most common after injury. In different study showed female victims of road traffic

accidents experienced PTSD more than male victims of road traffic accidents, and those who were employed among the victims of road traffic accidents experienced PTSD more than those who were not employed. Another study showed that 18.4% fulfilled the criteria for Posttraumatic Stress Disorder (DSM-III-R) within 6 months after the accident. Patients who developed PTSD were injured more severely and showed more symptoms of anxiety, depression and PTSD a few days after the accident than patients with no psychiatric diagnosis (Bryant ,RA., et al. 1996).

In our country we only treat the physical condition but we did not treat the psychological condition specially when developed PTSD. In developing country like Bangladesh it is necessary to diagnose the PTSD and psychological assistance, mental health care and motivational intervention is needed after road traffic injury. Because after road traffic injury maximum lose their jobs and they are unable to normal life lead due to their scare of injury, amputation of limb. So we need more research on this topic for a better life and to add psychological intervention after hospitalization and during discharge of road traffic accidents patients.

OBJECTIVES

General objective was to assess post-traumatic stress disorder among road traffic accident victims. Specific objectives were to determine the level of Post-Traumatic Stress Disorder using the PTSD checklist stressor specific (PCL-S), to ascertain the type of road traffic accidents, to determine the socio-demographic characteristic of RTA victims, to assess the relationship between PTSD and socio-demographic characteristics of the victims.

MATERIALS AND METHODS

A cross sectional study was conducted to assess the level of post traumatic stress disorder among road traffic accident victims. The respondents were admitted in in-patient departments of National Institute of Traumatology and Orthopedic Rehabilitation (NITOR).

Study Type

A cross sectional study was conducted in in-patient departments in National Institute of Traumatology and Orthopedic Rehabilitation (NITOR) to assess the level of post traumatic stress disorder among road traffic accident victims.

Study Period

The duration of the study was 12 months (January to December 2013). Initially research protocol was developed and approved by local ethical committee of NIPSOM, Dhaka. The initial week was utilized for selection of topics and setting of objectives. The following weeks were for, questionnaire preparation, pretesting of the questionnaire and collection of data and another week for review of literatures, data entry, data analysis, writing result, discussion, conclusion and recommendation. The work schedule has been shown in annexure 1.

Study Place

The study was conducted in in-patient department of National Institute of Traumatology and Orthopedic Rehabilitation (NITOR). NITOR is a specialized tertiary level hospital for RTA patient. It is the largest tertiary level facilities for RTA patients in Bangladesh. Large number of RTA patients are available in these units for treatment because patients from different areas of the country attended this hospital for special health care.

Study Population

All RTA patients admitted in in-patient department of National Institute of Traumatology and Orthopedic Rehabilitation (NITOR).

Sample Size

$$\text{Sample size (n)} = Z^2pq \div d^2$$

Where,

$$Z = 1.96$$

$$n = \text{required sample size}$$

$$p = \text{estimated prevalence} = 13.3\% = 0.133 \text{ (Ongecha-owuor, FA, et al. 2004)}$$

$$d = \text{margin of error at 5\% (standard value of 0.05)}$$

$$= \{(1.96)^2 \times 0.133 \times (1 - 0.133)\} \div (0.05)^2$$

$$= (3.84 \times 0.133 \times 0.867) \div 0.0025$$

$$= 0.442794 \div 0.0025$$

$$= 177.11$$

$$= 177$$

The study was conducted among 202 RTA patients.

So sample size was 202

Selection Criteria

Inclusion criteria:

- Only adult patients (more than 18) were included.
- Patient's willingness to participate in this study.
- Patients were included irrespective of sex.

Exclusion criteria:

- Patient less than 18 years old.
- Severely ill patient who were unable to take part in the interview.
- Patient who did not provide to take part in the interview

Sampling Technique

Convenience sampling technique was followed. After fulfilling the eligibility criteria all available RTA victims were taken in

the study who was admitted in the in-patient department of NITOR.

Data collection instruments

a. Questionnaire

A semi-structured questionnaire was developed both English (annex-2) and in Bangle (annex-3) using the variables and specific objectives of the study from the patients by face to face interview. It contained questions related to: 1. Socio-demographic characteristics 2.Information regarding RTA 3. Information of the patients regarding PTSD checklist (according to the Diagnostic and Statistical Manual-IV, Text Revision (DSM-IV-TR)).

b. Checklist

A checklist was used to collect the RTA related information of RTA patients.

Pre-testing

Before data collection, pre-testing of questionnaire and checklist were done in in-patient unit of NITOR. According to the finding of pre-testing necessary modification were done to the questionnaire and checklist.

Data Collection Techniques:

Researcher herself collected data by means of the following techniques:

- Face to face interview
- Reviewing medical documents

The interview was conducted privately as par as possible and before proceeding the data collection, the detail of the study was explained to each eligible respondent and informed written consents were obtained from the respondents. Each of

questionnaires took appropriately 25 to 30 minutes to fill up. Data were collected every day except Fridays, from 10am to 4pm. On an average, 10 respondents were interviewed daily.

Data Processing

Data processing involved

- Categorization of the data
- Coding
- Summarizing the data
- Categorizing to detect errors or omissions and to maintain consistency and validity
- Then these were entered into SPSS software for windows in computer for analysis

Data Analysis

Data were analyzed by Statistical Package for Social Science (SPSS) version 19. For descriptive statistic means, standard deviation & ranges for categorical data were calculated as required. For inferential statistics χ^2 test were done to analyze the level of PTSD. Data were presented in frequency table, bar and pie chart as necessary.

Ethical Consideration

Ethical clearance was taken from ethical committee of NIPSOM prior to initiation of study. Informed written consent was taken from the respondent before interview. Privacy of the respondent was maintained and interview was not disclosed to any unauthorized person. Complete assurance was given that all information provided by the respondent will be kept confidential. Their name or anything which can be identified them will not be published. Their participation and contribution was acknowledged with due respect. Full freedom of respondents to refuse and withdraw him from the study anytime will be taken into consideration.

RESULT:

1.0 Association between PTSD and place of accident of the patients

Distribution of place of accident	PTSD		Total f (%)
	Absent f (%)	Present f (%)	
Highway	42 (48.8)	46 (51.2)	86 (100.0)
Subway	47 (64.4)	26 (35.6)	73 (100.0)
Intersection of road	30 (69.8)	13 (30.2)	43(100.0)
Total	119 (58.9)	83 (41.1)	202(100.0)
Significance	x ² =6.602 ₍₂₎ ,p<0.05		

Table-23: Association between PTSD and place of accident of the patient

46(51.2%) accident occurred in highway developed PTSD. On the other hand 13 (30.2%) accident occurred in inter section of the road developed PTSD. This difference by PTSD by place of accident was statistically significant [x²=6.602₍₂₎,p<0.05]

2.0 Association between PTSD and type of accident of the patients

Type of accident	PTSD		Total f (%)
	Absent f (%)	Present f (%)	
Bus accident	20(39.2)	31(60.8)	51(100.0)
Truck accident	03(30.0)	07(70.0)	10(100.0)
Motor cycle accident	31(66.0)	16(34.0)	47(100.0)
Car accident	12(75.0)	04(25.0)	16(100.0)
Bi cycle accident	10(76.9)	03(23.1)	13(100.0)
Auto bike accident	43(66.2)	22(33.8)	65(100.0)
Total	119(58.9)	83(41.1)	202(100.0)
Significance	x ₂ =17.452 ₍₅₎ p=0.004		

Table 22: Association between PTSD and type of accident of the patients

07(70%) accident occurred by truck accident were developed PTSD. 31(60.8%) accident occurred by bus accident were developed PTSD. This difference of PTSD by type of accident was statistically significant [x₂=17.452₍₅₎p=0.004]

3.0 Association between PTSD and occupation of the road traffic accident patients

Occupation of RTA patients	PTSD		Total f (%)
	Absent f (%)	Present f (%)	
Student	07(50.0)	07(50.0)	14(100.0)
Service Holder	23(69.7)	10(30.3)	33(100.0)
Business	13(52.0)	12(48.0)	25(100.0)
Housewife	18(52.9)	16(47.1)	34(100.0)
Day laborer	04(28.6)	10(71.4)	14(100.0)
Unemployed	05(55.6)	04(44.4)	09(100.0)
Motor worker	25(58.1)	18(41.9)	43(100.0)
Farmer	24(80.0)	06(20.0)	30(100.0)
Total	119(58.9)	83(41.9)	202(100.0)
Significance	$\chi^2=13.927_{(7)}p=0.052$		

Table: Association between PTSD and occupation of the road traffic accident patients

Among the day laborer majority i.e 10(71.4%) of the patients developed PTSD, 07(50.0%) of the students and 12(48.0%) of businessman developed PTSD. On the other hand 24(80.0%) farmer and 23(69.7%) service holder did not developed PTSD. This difference of PTSD by occupation of the RTA patients was statistically significant [$\chi^2=13.927_{(7)}p=0.052$]

4.0 Association between PTSD and age of the road traffic accident patients

Age(Yrs)	PTSD		Total f(%)
	Absent f(%)	Present f(%)	
18-30	59(50.9)	57(49.1)	116(100.0)
31-59	45(67.2)	22(32.8)	67(100.0)
60-75	15(78.9)	04(21.1)	19(100.0)
Total	119(58.9)	83(41.1)	202(100.0)
Significance	$\chi^2=8.141_{(2)}P=0.017$		

Table: Association between PTSD and age of the road traffic accident patients

Between 18-30 years, patients who developed PTSD were 57(49.1%). Between 31-59 years and between 60-75 years, patients developed PTSD were 22(32.4%) and 04(21.1%). This difference of PTSD by age of the RTA patients was statistically significant [$\chi^2=8.141_{(2)}p=0.017$]

5.0 Distribution of RTA patients by Post-Traumatic Stress Disorder

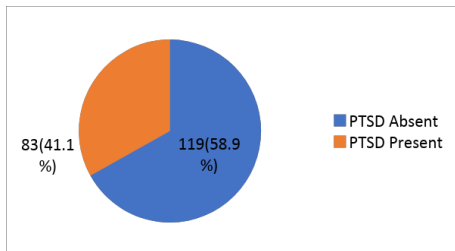


Figure 19: Distribution of RTA patients by Post-Traumatic Stress Disorder

Among 202 the RTA patients, majority i.e 119(58.9%) patients not developed Post traumatic stress disorder and 83(41.1%) patients developed Post traumatic stress disorder. Mean post-traumatic stress disorder of RTA patients were 1.41(±0.493)

6.0 Distribution of RTA patients by scoring of Post Traumatic Stress Disorder

Scoring of PTSD	Frequent	Percent
21-30	70	34.7
31-40	49	24.3
41-50	83	41.1
Total	202	100.0
Mean±SD	36.19±7.2134	

Table 16: Distribution of RTA patients by scoring of Post Traumatic Stress Disorder

Among all patients majority i.e 83(41.1%) were belongs to 41-50 scores. The rest 70(34.7%) and 49(24.3%) were belongs to 21-30 and 31-50 scores respectively. Mean scoring was 36.19±7.2134

7.0 Distribution of types of RTA patient’s accident by Vehicles:

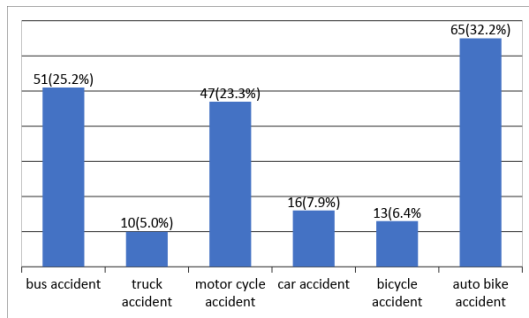


Figure7: Distribution of types of RTA patient’s accident by Vehicles

The study revealed that majority i.e. 65(32.2%) of accident occurred by auto bike, while the rest 51(25.2%), 47(23.3%), 16(7.9%),13(6.4%) and 10(5%) of accidents occurred by bus, motor cycle, car, bicycle and truck.

8.0 Age of the RTA patients:

Age(Years)	Frequency	Percent
18-30	116	57.4
31-59	67	33.2
60-75	19	9.4
Mean ± SD	37.69±13.236	

Table 1: Distribution of the RTA patients by age

The mean age of the patients was 37.69(±13.236) years. It was found that 116(57.4%) of the patients were from age group 18-30 years while about 67(33.2%) of them were from age group 31-59 years. The remaining 19(9.4%) patients were from age group 60-75 years. The data are presented in the Table 1

9.0 Distribution of RTA patient's accident by place

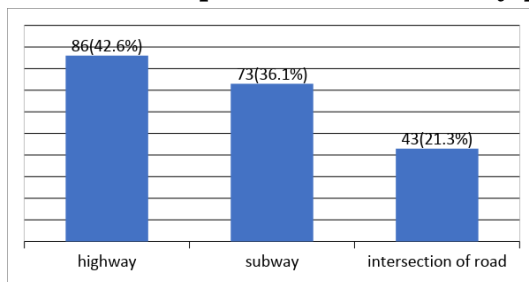


Figure 6: Distribution of RTA patient's accident by place

The study revealed that majority i.e. 86(42.6%) of the accidents occurred in highways, while the rest 73(36.1%) and 43(21.3%) accidents occurred in subways and intersection of the road.

DISCUSSION

Majority 121-150 days, 151-180 days and 181-210 days duration accident were developed 1 (100%) PTSD. On the other hand 61-120 days duration accident was developed 57(50.4%) PTSD and 30-60 days duration accident was developed 22 (26.2%) PTSD. This difference by PTSD by distribution of duration of accident was statistically significant [$\chi^2=18.219_{(5)}$ p<0.05]. Severe injuries disabled people for long times and these may causes to develop PTSD.

46 (51.2%) accident occurred in highway developed PTSD. On the other hand 13 (30.2%) accident occurred in intersection of the road developed PTSD. This difference by PTSD by place of accident was statistically significant [$\chi^2=6.602_{(2)}$, p<0.05]. The another study (Obiora I et al. 2006) also revealed that most of the accident occurred in highways developed PTSD.

07(70.0%) accident occurred by truck accident were developed PTSD. 31(60.8%) accident occurred by bus accident were developed PTSD. This difference of PTSD by type of accident was statistically significant [χ

$\chi^2=17.452_{(5)}, p<0.05$]. Result showed that most of the accidents occurred by truck and they developed severe injuries. Severe injuries may lead to develop PTSD.

In this present study majority of the patients were day laborer have found to be significantly linked with stress. Results also revealed that service holder, motor worker and business man although suffer from depression but at a lesser proportion and intensity. This difference of PTSD by occupation of the RTA patients was statistically significant [$\chi^2_{(7)}=13.927, p<0.05$]. Stress was significantly associated with some clinical and socio-demographic variables such as income, professional activity and co-morbidities. Similar to our study higher percentage of depression was found among unemployed and those without family income (Obiora I et al.2006).

Between 18-30 years, patients who developed PTSD were 57(49.1%). Between 31-59 years and between 60-75 year, patients who developed PTSD were 22(33.8%) and 04(21.1%). This difference of PTSD by age was statistically significant [$\chi^2_{(2)}=8.141, p<0.05$]. Younger group are very prone to develop PTSD because their age. This age they are very sensitive. Among 202 the RTA patients, majority 119(58.9%) patients not developed Post traumatic stress disorder and 83(41.1%) patients developed Post traumatic stress disorder. Mean post traumatic stress disorder of RTA patients were 1.41(± 0.493).

In this study 202 RTA patients were interviewed. Among them 41.1% of RTA patients had a positive PTSD test after 1 month of accident. Psychological problems in RTA victims affect quality of life and also cooperation rehabilitation activities. It is reported that anxiety is the common aftermath of physical and emotional trauma.

Among all patients majority 83(41.1%) were belongs to 41-50 scores. The rest 70(34.7%) and 49(24.3%) were belongs to 21-30 and 31-50 scores respectively. Mean scoring was 36.19 \pm 7.2134.

The study revealed that majority i.e. 65(32.2%) of accident occurred by auto bike, while the rest 51(25.2%), 47(23.3%), 16(7.9%),13(6.4%) and 10(5%) of accidents occurred by bus, motor cycle, car, bicycle and truck. Now a days auto bike are mostly used and their drivers are not well educated and they are no concern about the law of driving. So it was the major cause to increase the number of auto bike accidents.

In this study mean age of the patients was 37.69 and SD was ± 13.236 years within range from 18-75 years. Majority of the patients are between 18-30 years, one third of the patients were between 31-59 years of age. Another 9.4% were between 60-75 years of age. Another study F.A Ongecha et.al reported that mean age of the patients was 34.63 ± 12.71 years. Another study A.K.M. Fazlur Rahman reported that age group of the patients were 15-29 years age. The victims suffering from PTSD at a young age may not benefit from powerful confronting strategies and need more time to be able to develop effective coping strategies and implement them.

The study reported that most of the accidents occurred in highways 86 (42.6%). While the rest 73 (36.1%) and 43(21.3%) accidents were occurs in subways and intersection of the road. Highways condition in our country is not satisfactory. Most of the accidents occurred in highways due to bad road condition of the highways.

CONCLUSION

This cross sectional study was conducted among the road traffic accident victims at the in-patient department of National Institute of Traumatology and Rehabilitation (NITOR) from January to December 2013. The study was conducted to assess the level of Post Traumatic Stress Disorder (PTSD) among Road Traffic Accident Victims. The study showed that male was predominant among the RTA victims but majority of female victims developed PTSD. The study revealed that younger age

groups were predominant and majority of them developed PTSD. About one third of the patients had primary level education and half of them were illiterate. Majority were motor workers and housewives. Most of the RTA victims were Muslims and married and majority came from nuclear family. The study showed that majority of the RTA patients in low income group and lived in semi-pucca houses. The study showed that majority of victims were suffering from severe type of injuries and most of the accident occurred in highways by auto bike and bus. Younger age group was more significant to the development of PTSD than older age group. PTSD was significantly higher in day laborers in comparison to another occupation. Accident occurred by truck was significantly higher to the development of PTSD than another type of accident. Accident occurred in the highways was significantly development of PTSD than another place. All the victims developed PTSD within 121-210 days and this difference was statistically significant. Post traumatic stress disorder is a major problem after RTA in our country. But it was not addressed properly. The study finding in respect of post traumatic stress disorder among road traffic accident victims should be estimated and necessary measures like psychological intervention, motivational assistance, mental health services and sometimes rehabilitation should launched.

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