Prevalence of post-traumatic stress disorder after road traffic accident at King Abdulaziz Medical City, Riyadh

Sami Eid Alanazi1*, Irfan Anjum2, Ahmed Samer Almohna1, Hamoud Mohammed Alfawzan1, Sultan M. Albugami1, Mohammad Nasser Almutairi1

ABSTRACT

Background: Road traffic accidents (RTAs) are one of the major concerns in the world. RTAs result in negative outcomes both psychologically and physically. Post-traumatic stress disorder (PTSD) is one of the most important psychological outcomes of RTAs, and it can result in long-lasting negative impacts and consequences. The aim of this study was to estimate the prevalence of PTSD after Road Traffic Accident at King AbdulAziz Medical City, Riyadh, Saudi Arabia.

Methods: This cross sectional included the records of patients who experienced RTAs and were admitted to King AbdulAziz Medical City in Riyadh during the period from January 2013 to January 2016. Data were analyzed using Statistical Package for the Social Sciences program version 23.

Results: There were 387 medical records of RTAs survivors included in this study. The mean ± SD age of the patients was 36 ± 17 years old. There were 92% Saudi individuals and 84% males. The prevalence of PTSD after motor vehicle accidents (MVAs) was 0.8%. Gender, age, and nationality didn’t affect the prevalence of PTSD after MVA; p-value 0.06, 0.41, and 0.8 for gender, age groups, and nationality, respectively.

Conclusion: The prevalence of PTSD after a road traffic accident was 0.8%, also the study didn’t find any association between gender, age, and nationality with PTSD after MVA.

Keywords: Prevalence, PTSD, road traffic, Saudi Arabia.

Introduction

The population in the world is exposed to road traffic accidents (RTAs), which are considered a major health concern. Almost 1.25 million deaths occur annually due to RTAs [1]. In Saudi Arabia, the Saudi General Directorate of Traffic reported 33,199 injuries and 7,489 deaths caused by RTAs in 2017 [2]. In Saudi Arabia, there were more than 130,000 annual deaths due to the RTAs as reported by The World Health Organization’s Global Status [3]. Saudi Arabia has a total population of 27 million, one-fourth of them are expatriates; the Saudi Roads have six million cars [4].

The outcomes of RTAs, including psychological and physical outcomes, can be disabling to the survivors [1]. The psychological consequences after RTAs could be long-lasting and affect the process of healing of physical injuries [5]. One of the most important and main consequences of RTAs for survivors is post-traumatic stress disorder (PTSD). It is an anxiety disorder that is evolved after exposure to a traumatic event such as critical RTAs, natural disasters, or war [1]. The symptoms of PTSD following RTAs, including nightmares and difficulty with sleeping, hyperarousal, isolation, emotional numbing, re-experiencing unwanted thoughts, avoidance of driving, and difficulty with concentrating [1].

The rates of PTSD after RTAs significantly vary around the world and even within the same country [1]. The prevalence rate of PTSD after RTAs varies between 6% and 45%, according to the global estimation [6]. In Japan, the prevalence of PTSD after RTAs was as low
as 8.5%, and it was related to RTAs that resulted in severe injury [7]. Higher rates of PTSD prevalence were reported from the USA and Spain; in the USA, the rate of PTSD development was 27.5%-24.3% of people at 6 months and 1 year, respectively, after moderate to severe injuries [8]. The rate was higher in Spain, where 32.8% of individuals who experienced RTAs were found to have the diagnostic criteria for PTSD 4 months following the RTAs [9].

PTSD can be considered a critical problem following RTAs, as it strongly affects the quality of life of RTAs survivors regarding their health and their relationships with their society and family [10]. The outcome and impact of psychological disorder after RTAs is as important as the physical consequences; however, the majority of research studies focuses on the physical consequences and ignores the psychological consequences [1]. In this study, the prevalence of PTSD among survivors of RTAs was estimated at King Abdulaziz Medical City in Riyadh, Saudi Arabia.

**Subjects and Methods**

This study was conducted at King Abdulaziz Medical City in Riyadh during the period from January 2013 to January 2016. It is a cross sectional study. Data were obtained from the records of the patients who experienced accidents during the mentioned period and were admitted to the emergency room. The research team collected the data from the medical records for each road traffic accident survivor based on data collection form; the collected data included demographic data and data related to the stress complaint of patients. The study included all adult patients from both genders, of all nationalities. The study excluded the records of patients who died after the accidents and those who do not have medical record number at the King Abdulaziz Medical City.

**Statistical analysis**

Statistical Package for the Social Sciences version 23 was used for data management; categorical data were presented as numbers and percentages, whereas numerical data were presented as mean and standard deviation. The association between PTSD after motor vehicle accident (MVA) and gender, age, and nationality was assessed by using the Chi-square test; the test was considered significant if $p$-value $\leq 0.05$.

**Results**

This study included data of 387 patients who experienced RTAs and were admitted to the emergency room of King Abdulaziz Medical City. The mean age of patients was 36 ± 17 years old. The large majority of patients was Saudi 360 (92%), whereas only 27 (8%) were non-Saudi patients. Males were more dominant compared to females, where there were 328 (84%) male patients and only 59 (16%) female patients. There were only 6 (1.5%) referred to the mental health unit (MHU) before MVA, and 22 (6%) were referred to MHU after MVA, Table 1.

The prevalence of Post-traumatic stress disorder (PTSD) before MVA was 1 (0.3%), whereas the prevalence of PTSD after MVA was 3 (0.8%), Figure 1.

The association between PTSD after MVA and different variables are shown in Table 2. The PTSD after MVA was more prevalent among females compared to males but with no significant difference ($p = 0.06$). There were no significant differences between the age groups regarding the prevalence of PTSD after MVA ($p = 0.41$). Although all cases that experienced PTSD after MVA were Saudi, there were no significant differences in the prevalence of PTSD after MVA regarding the nationality ($p = 0.8$).

**Discussion**

The RTAs are a significant problem in the Arab Gulf countries, especially in Saudi Arabia [4]. The referral rate to the MHU increases from 1.5% before the MVA to 6%

### Table 1. Demographics of patients.

<table>
<thead>
<tr>
<th>Variables</th>
<th>N (%)/Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>36 ± 17</td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
</tr>
<tr>
<td>Saudi</td>
<td>360 (92)</td>
</tr>
<tr>
<td>Non-Saudi</td>
<td>27 (8)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>328 (84)</td>
</tr>
<tr>
<td>Female</td>
<td>59 (16)</td>
</tr>
<tr>
<td>Referral to MHU before MVA</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>6 (1.5)</td>
</tr>
<tr>
<td>No</td>
<td>375 (96)</td>
</tr>
<tr>
<td>Referral to MUH after MVA</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>22 (6)</td>
</tr>
<tr>
<td>No</td>
<td>361 (93)</td>
</tr>
</tbody>
</table>

![Figure 1. The prevalence of PTSD before and after MVA.](image-url)
The prevalence of PTSD after RTAs was much higher, and it was within the same country. In Portugal, the prevalence of PTSD varies with the variation of the region even PTSD was 15.4%; this indicates that the prevalence study [15], among 416 participants, the prevalence of among 398 participants [14]. In a recent Ethiopian study from Ethiopia reported a prevalence of 12.6% 46.5%, reflecting a high rate of prevalence [13]. Another In Ethiopia, the prevalence of PTSD after RTAs was high, and it was 46.7% [12]. This high rate of PTSD among workers can be explained by the fact that workers are more prone to exposure to trauma compared to other individuals in the population.

A recent study from Saudi Arabia showed that the prevalence of PTSD was evaluated by three methods; PTSD cut-off score, criteria, and combined, the prevalence of PTSD was 22.63%, 24.8%, and 19.6%, respectively, based on the methods of assessment [11]. The variation between our findings and the previous Saudi study [11] can be explained that our data was dependent on medical records of patients who already admitted to the hospital and they evaluated by physicians, whereas the data of the previous Saudi study [11] was dependent on an online survey, where individuals can misevaluate their symptoms or complaint.

In a study from Jeddah conducted on workers and admitted to the trauma centers in Jeddah, the prevalence of PTSD was high, and it was 46.7% [12]. This high rate of PTSD among workers can be explained by the fact that workers are more prone to exposure to trauma compared to other individuals in the population.

In Ethiopia, the prevalence of PTSD after RTAs was 46.5%, reflecting a high rate of prevalence [13]. Another study from Ethiopia reported a prevalence of 12.6% among 398 participants [14]. In a recent Ethiopian study [15], among 416 participants, the prevalence of PTSD was 15.4%; this indicates that the prevalence of PTSD varies with the variation of the region even within the same country. In Portugal, the prevalence of PTSD following RTAs was much higher, and it was 58.9% [16]. The prevalence of PTSD in Germany was much lower than the prevalence in our study, where the prevalence was very low, 0.78% among 32,807 collected data sets [17].

It was suggested that the prevalence of PTSD could vary according to the variation of several factors, such as local environmental factors, culture, healthcare systems, and socioeconomic status [18]. In our study, we found no association between the prevalence of PTSD and any of the investigated factors. Although there were two females who experienced PTSD compared to one male, two individuals with an age range of 31-50 years experienced PTSD compared to one individual with age 30 or less, and the three individuals suffering PTSD were Saudi, and there were no significant differences; gender, age, and nationality had no significant impact on the prevalence of PTSD. The correlation between the development of PTSD and gender was investigated, and it was demonstrated that women were less prone to experience RTAs compared to men, but they were more vulnerable to develop PTSD [19]. A study that included different regions from Saudi Arabia showed that PTSD was more prevalent among females compared to males and this difference was significant. Also, marital status had a significant impact on the PTSD prevalence, whereas age had no significant effect, and the prevalence of PTSD did not vary with different age groups [11].

In agreement with our findings, one study revealed that gender had no significant influence on the prevalence of PTSD after RTAs, where 60.5% of females and 53.3% of males met the diagnostic criteria of PTSD [20]. However, it should be noted that also more females experienced PTSD compared to males, even if this increase is not significant. A study from Jeddah conducted on workers reported gender, nationality, smoking status, and education level were predictors of the prevalence of PTSD [12]. Female gender was also a significant factor associated with increasing the rate of PTSD prevalence, as reported in Portugal study [3].

**Conclusion**

RTAs lead to an increase in the number of referrals to MHUs; however, the prevalence of PTSD was very low. There was no factor found to be associated with the prevalence of PTSD, although it was more common to be experienced by Saudi individuals. Further studies are recommended with a larger sample size in order to investigate factors that may increase the prevalence of PTSD in patients exposed to RTAs.

**List of Abbreviations**

PTSD  Post-traumatic stress disorder

**Conflict of interest**

The authors declare that there is no conflict of interest regarding the publication of this article.
Prevalence of post-traumatic stress disorder after road traffic accident

Funding
None.

Consent to participate
Not applicable.

Ethical approval
The research was approved by King Abdulaziz Medical City.

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