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Prevalence of Post-Traumatic Stress Disorder after road traffic accident at King Abdulaziz Medical City, Riyadh

Running Title: Prevalence of Post-Traumatic Stress Disorder after road traffic accident

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Abstract

Background:

Road traffic accidents are one of the major concerns in the world. Road traffic accidents result in psychological and physical negative outcomes. Post-traumatic stress disorder is one of the most important psychological outcomes of road traffic accidents, it can result in long-lasting negative impacts and consequences. The aim of this study was to estimate the prevalence of Post-Traumatic Stress Disorder after Road Traffic Accident at King AbdulAziz Medical City, Riyadh, Saudi Arabia.

Methods:

This cross sectional included the records of patients who experienced road traffic accidents and were admitted to King AbdulAziz Medical City in Riyadh during the period from January 2013 to January 2016. Data were analyzed using SPSS 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 MVA 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 Post-Traumatic Stress Disorder after 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 33199
injuries and 7.489 deaths caused by RTAs in 2017 [2]. In Saudi Arabia, there were more than 130000 annual deaths due to the RTAs as reported by The world health organization’s (WHO) Global Status [3]. Saudi Arabia has a total population number 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 affecting 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% to 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 six months and one 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 four months following the RTAs [9].

PTSD can be considered as 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 researches focuses on the physical consequences and ignores the psychological consequences [1]. In this study, the prevalence of post-traumatic stress disorder among survivors of road traffic accidents 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 was 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 don't have medical record number at the King Abdulaziz Medical City.

Statistical analysis:

SPSS 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 MVA and gender, age and nationality was assessed by using the Chi-square test; the test was considered significant if P-value ≤0.05.

Results:

This study included data of 387 patients who experienced road traffic accidents 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 mental health unit (MHU) before motor vehicle accident (MVA), and 22(65) were referred to MHU after MVA, table1.

Table1: 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>
</tbody>
</table>
The prevalence of Post-Traumatic stress disorder before motor vehicle accident (MV) was 1(0.3%), whereas the prevalence of post-traumatic stress disorder after MVA was 3(0.8%), figure1.

![Figure 1: The prevalence of PTSD before and after MVA](image)

The association between PTSD after MVA and different variables are shown in table2. 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).
Table 2: The association between PTSD after MVA and demographics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Diagnosis of PTSD after MVA</th>
<th></th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N(%)</td>
<td>N(%)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1(33)</td>
<td>326(85)</td>
<td>0.06</td>
</tr>
<tr>
<td>Female</td>
<td>2(67)</td>
<td>57(15)</td>
<td></td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤30</td>
<td>1(33)</td>
<td>191(50)</td>
<td>0.41</td>
</tr>
<tr>
<td>31-50</td>
<td>2(67)</td>
<td>126(32)</td>
<td></td>
</tr>
<tr>
<td>≥51</td>
<td>0</td>
<td>68(18)</td>
<td></td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saudi</td>
<td>3(100)</td>
<td>359(93)</td>
<td>0.8</td>
</tr>
<tr>
<td>Non-Saudi</td>
<td>0</td>
<td>27(7)</td>
<td></td>
</tr>
</tbody>
</table>

Discussion:

The RTAs are a significant problem in the Arab Gulf countries, especially in Saudi Arabia [4]. The referral rate to the mental health unit (MHU) increase from 1.5% before the motor vehicle accident (MVA) to 6% after MVA. This increasing rate shows the impact of the RTAs on the mental health of the individuals. The prevalence of PTSD before MVA was 0.3%, and it increased to 0.8% after MVA. The prevalence of PTSD after MVA was low compared to the rate of referral to MHU after MVA. This can be explained by the other individuals referred to MHU and who weren't diagnosed with PTSD, may complain about other psychological disorders such as depression or anxiety or even were healthy and just reported few symptoms similar to PTSD symptoms.

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 by 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% \cite{12}. This high rate of PTSD among workers can be explained by the fact that workers are more prone to be exposed 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 \cite{13}. Another study from Ethiopia reported a prevalence of 12.6% among 398 participants \cite{14}. In a recent Ethiopian study \cite{15}, among 416 participants, the prevalence of PTSD was 15.4%; this indicates that the prevalence of PTSD is varied with the variation of the region even in the same country. In Portugal, the prevalence of PTSD following RTAs was much higher, and it was 58.9% \cite{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 32807 collected data sets \cite{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 \cite{18}. In our study, we found no association between the prevalence of PTSD and any of the investigated factors. Although there were two females experienced PTSD compared to one male, two individuals with an age of 31-50 years experienced PTSD compared to one individual with age 30 or less, and the three individuals suffering PSTD were Saudi, 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 \cite{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 didn't vary with different age groups \cite{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 \cite{20}. However, it should be noted that also more females experienced PTSD compared to males, even if this increase isn’t
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 [03].

**Conclusion:**

Road Traffic accidents lead to an increase in the number of referrals to mental health units; however, the prevalence of post-traumatic stress disorder was very low. There was no factor found to be associated with the prevalence of post-traumatic stress disorder, 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 post-traumatic stress disorder in patients exposed to road traffic accidents.

**Declaration of Conflicting Interests:**

The authors declare that there is no conflict of interest regarding the publication of this article.

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**References:**


