

# A Review of Road traffic accident in Saudi Arabia: the neglected epidemic

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## ABSTRACT

Road traffic accidents (RTA) are continuing to be an occurrence of epidemic proportions both in the developed and developing world statistically becoming one of the leading causes of mortality and morbidity. In Saudi Arabia, road traffic injuries are increasing exponentially year by year in spite of advances in safety technology. This review is based on the analysis of all published articles on road traffic accident in KSA published during the last 10 years. Critical analysis revealed that most of these unfortunate events can be attributed to vehicles travelling at excess speed and or drivers disobeying traffic signals which are absolutely preventable in nature. RTA accounted for most of the trauma admissions to hospital with young adults, especially males, who are the at risk population. The most frequently injured body regions as reported in the studies were head and neck, followed by upper and lower extremities. Latest statistics of Saudi Arabia indicates that approximately 19 deaths and 4 injuries occur daily due to road traffic accidents. Hence, there arises an urgent need to compile a comprehensive demographic baseline statistics and pattern of injuries that will provide scientific evidence based information to effectively educate the public regarding road safety. It will also help to plan appropriate interventions that was previously overlooked to prevent such loss of life and lifelong disability.

**Keywords:** Road traffic accident, Saudi Arabia, road safety

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## INTRODUCTION

Road traffic accidents continue to be a major health problem worldwide. Saudi Arabia occupies one of the foremost position with high mortality and morbidity even with all the preventive measures and programs implemented locally, nationally or internationally<sup>1,2,3,25</sup>.

The World Health Organization's (WHO) Global Status Report on Road Safety, reports that mortality due to road traffic accidents per 100 000 population in Saudi Arab is 24.8 (> 130,000 deaths annually). Statistics (per 100 000 population) from other Gulf countries varies from 10.5 (Bahrain), 30.4 (Oman), 16.5 (Kuwait) and 12.7 (UAE). Studies indicated that the prevailing culture and lifestyle were some of the reasons for dangerous driving habits and noncompliance with traffic rules<sup>28</sup>. Evidently, it is projected to be the fifth leading cause of death by 2030<sup>4,33</sup>. Saudi Arabia with its total population of approximately 27 million, one-fourth of whom are expatriates has more than 6 million cars on the roads<sup>5</sup>.<sup>6</sup>. Studies have revealed that currently more than 19

deaths occur daily and approximately 4 people injured every hour in the country due to road traffic accidents<sup>7</sup>. Among United States and other countries with advanced traffic laws and regulations, it is ranked above them in terms of road traffic accidents with more than double the death rate (29 per 100 000)<sup>33</sup>. The Secretary General of the Shura Council declared that the Kingdom has spent on an average 26 billion riyals annually on car accidents numbering more than four million further adding that, "The Kingdom is at the forefront of the world in terms of human and physical attrition due to traffic accidents<sup>8</sup>."

The aim of this review was to identify the demographic statistics, pattern of injuries, changing trends and crucial preventive approaches to road traffic accidents in KSA over the last 10 years. This analysis aims to provide a better and more informative insight in limiting the overall incidence of RTAs, its severity and the resultant injuries in the Kingdom of Saudi Arabia.

### General objectives:

Critically review previously published research articles in the past 10 years on the pattern of injuries in road traffic accidents in Saudi Arabia

### Specific Objectives:

1. To assess the demographic pattern in the road traffic accidents.
2. To determine the changing trends in RTA and its association with the frequency of accidents in the past 10 years.

- To suggest preventive approaches to minimize road traffic accidents and improving its awareness among the general population.

### Methodology

The search for the articles relating to key words using “road traffic accidents”, “Saudi Arabia” and “motor vehicles” was conducted from May 2015 to September 2015 in PubMed, Google Scholar, Saudi Digital Library (SDL), Uptodate, Saudi Medical Literature and Science Direct. A concerted effort was also used in taking information from the WHO website, Ministry of Interior (MOI) KSA and local police department websites. All the publications, information and bulletin since the past 10 years within and outside the Kingdom of Saudi Arabia was used to develop a database for analyzing the objectives of this study. Efforts were made to obtain articles that were in English language and those in other languages were rejected. A total of 33 articles were chosen relevant to the topic which was independently screened by two authors to determine the outcome measures. For analysis purpose RTA was considered as an exposure variable and the outcome was documented as either death at the accident site or in hospital, injury or disability.

### RESULT AND DISCUSSION

We assessed 33 articles on road traffic accidents from different regions of Saudi Arabia. The study mainly targeted the vehicular occupants at the time of accidents. During the review process, the studies revealed that the frequency of accidents were more among male youths than females. This was seen in the prevalence of reported RTA among males which ranged from 65.3 % to 93.4 %, while that for females the range was from 6.6% to 34.7%<sup>9,10,11,31</sup>. Barrimah et al<sup>12</sup> showed that 72.7% of RTA occurred among people aged 30–49 years out of whom 545 (65.3%) were males and 290 (34.7%) females. Another study by Khan et al<sup>15</sup> similarly showed higher prevalence among individuals in 20 – 30 years age group. One possible reasoning for such outcomes is the tendency among this group to avoid the use of safety devices like seatbelts etc. and ignoring traffic rules. Documented studies have shown lower incidence of RTA among individuals who are aged below and above 20 – 49 years<sup>9,11</sup>. As there is an increase in the number of children driving under the legal driving age in Saudi Arabia it's the parents, rather than the officials, who are responsible for preventing them from driving. Don't allow under aged children to drive before they are properly trained and issued driving license. Allowing them to drive illegally is like giving them a weapon to kill and be killed. Barrimah I et al<sup>12</sup> in their study showed that maximum accidents occurred on Wednesdays (15.6%), Thursdays (15.7%) and Fridays (14.9%)

while Mondays (13.2%) were the lowest. This is also in accordance with the study by Qayed<sup>13</sup> which showed similar results (Wednesday 15.6%, Thursday 16.2% and Friday 15.1%). Another study by Zahrani et al<sup>14</sup> also showed similar outcome. This could be attributed to the fact that some adolescents and young adults participate in unofficial car races, drifting with their peers at the week-ends as a leisure-time activity. In addition, there are more number of people out on the road visiting their relatives or recreation and shopping during the weekend exposing themselves to the risk of RTA.

Most of the accidents have been shown to occur during the post noon hours as seen in the study by Batouk AN et al<sup>11</sup> who showed that the maximum number of cases were seen during the daylight hours between 12:00 and 18:00 hours (38%). Similarly, Khan Z U<sup>15</sup> in his study showed that peak incidence of road traffic accidents occurred during 2.00PM to 5.00PM. This includes the rush hour period when people are returning home from work and school closes or travelling to neighboring towns and villages. Other studies pointed out that this also represents the period during which people are engaged in outdoor recreational activities<sup>14, 30</sup>.

Analyzing the site of injury among the previous articles it was found that head and neck (63.9%) were more commonly involved in the accidents as pointed out by Qayed<sup>13</sup> in his study followed by the lower limbs (27.8%). Similar study by Batouk et al<sup>11</sup> showed that head and neck (45%) was the most commonly effected region followed by chest injury (39%). In contrast, a recent study by Khan Z U<sup>15</sup> found that the lower extremities was the commonest location followed by the by the skull and face. Apart from the increasing number of vehicles on the road, scientific research done over the past few years have tried to prove that severity of injury in road traffic accidents is due primarily to the deceleration on vehicle impact<sup>15,28</sup>. Barrimah et al<sup>12</sup> showed in their study that very high speed was responsible for as high as 43.11% of road traffic accidents. A need is felt for a long time to prevent such accidents and reduce their severity with a well-placed security and protection system. This system is called “Saher System”. The “Saher” is a state-of-the-art traffic management system that can monitor vehicles and track them using a license plate recognition technology. It had been in development for a year and now is working on all major cities by monitoring traffic violations as they happen. Saudi Arabia has also enforced seat belt law from 5th December 2000 making its use compulsory for all drivers and front seat passengers<sup>28,29</sup>.

Ansari et al<sup>16</sup> and others in their study found that on an average around 50% of RTA is due to excess speed and violation of signals at intersection. In contrast, other authors like Bendak<sup>17</sup>, Al-Naami et

al<sup>18</sup>, Nofal F H<sup>19</sup> reported other factors like not wearing seatbelts, driver error and reckless driving as the primary cause. Even though several developing countries have the necessary legislative framework for road safety (WHO), only 47% among them have laws governing risk factors such as speeding, drink driving, helmets, seatbelts and child restraints<sup>32</sup>.

Other studies have pointed out the hazards posed by owners with high end sports cars who cause accidents by passing on blind curves from both directions<sup>29</sup> and livestock that are on the roads causing high speed collision. That is why motorists should drive defensively, use extreme caution, and wear their seat belts at all times<sup>27</sup>.

Several proposals for effective interventions to reduce such accidents have included factors like

high speed, overcrossing signal, use of mobile phone during driving, young drivers' behavior, and lack of focus on post-crash care, including both pre-hospital and hospital care<sup>20,25,26,29</sup>. In such scenario, World Health Report on prevention of injury has deemed it necessary to identify separate risk factors for road crash, road injuries, and post-crash care<sup>21</sup>. A Romanian study has proposed national road safety strategies in line with the European Union objectives taking into consideration both national priorities and objectives<sup>22</sup>. This can only be successful if continuous monitoring and surveillance is done to keep into focus the ever increasing production of high performance vehicles and its potential danger of increased speed that should be kept in check<sup>23</sup>.

**Table 1: Comparative overview of different study with findings on RTA in Saudi Arabia**

Study title	Study design	Study location	No. of participants	Age	sex	Cause	Day	Time of accident	Site of Injury
Barrimah et al, 2012	CS	Hospitals and PHC in Buraydah, Al-Qassim region	835	72.7% were aged 30-49 years	545 (65.3%) were males and 290 (34.7%) were females	High speed	Wed- 15.6% Thurs.- 15.7% Fri- 14.9%	---	----
Khan et al, 2010	CS	Armed Forces Hospital Southern Al-Aseer, KSA	1513	20 to 30 years	1356 male and 157 female	High speed	NA	2.00PM to 5.00PM	Lower limb- Head and neck
Al-Naami et al, 2010	CS	--	---	--	--	Driver errors	--	--	--
Bendak, 2005	CS	Riyadh	900		NA	Seat belt	--	--	--
Elshinnawey et al, 200813	CS	Mortality records of MOH	21905	---	Males>females	NA	--	--	--
Ansari et al, 20008	CS	Riyadh	66914	NA	NA	High speed	--	--	--
Qayed, 199821	CS	Al-hasa	6117	36.1%(25-44yrs)	2170 (85.1%) were males and 381 (14.9%) were females	High speed	Wed- 15.6% Thur- 16.2% Fri- 15.1%	--	Head & neck- 63.1% lower limb- 27.87%
Batouk et al, 199623	CS	Abha	574	(21-49 years)	283 (93.4%) were males and 20 (6.6%) female 14:1	High speed	--	12.00Hrs to 18.00 Hrs.	Head And neck- 45% chest injury- 39%
Nofal FH	CS	Riyadh	13390	25-35		Reckless driving		12.PM-3PM	
Zahrani A,etal 1994	CS	Ministry of Interior's Yearly Statistical Report, Jeddah	8346	31-40	NA	High speed	--	--	--

\*CS –cross sectional study

## CONCLUSION AND RECOMMENDATION

High rates of road traffic accidents are a recurring nightmare in most Arab Gulf countries but the humongous problem of mortality and morbidity in Saudi Arabia is much scarier. Traffic deaths and injuries are admittedly preventable, but for prevention to be successful, an integrated approach to traffic safety that addresses vehicles, road users and road system infrastructure is needed coupled with traffic safety education and effective enforcement.

The five Es of road safety required to tackle the menace of road traffic accidents in Saudi Arabia and other countries are road engineering, traffic safety education, strong enforcement of traffic rules and regulations, effective emergency services, and evaluation. Finally the suggested simplified framework for such an approach are as follows: setting up goals, continuous data collection and analysis, identification and implementation of safety measures, setting up of priorities and improving technically the design and safety measures in the vehicle during its production.

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