

Original article

## Knowledge, Attitude, and Practice regarding Road Traffic Signs and Regulations among the General Population of Misurata City, Libya

Mohammed Ben Saud\*<sup>ID</sup>, Omar Alhaddad<sup>ID</sup>, Salem Shenaisheh<sup>ID</sup>, Anas Ben Amer<sup>ID</sup>, Mohamed Shetshat<sup>ID</sup>, Najah Arrotob<sup>ID</sup>,  
Noura Aljamal<sup>ID</sup>, Ahmed Swesi<sup>ID</sup>, Kahlil Albergli<sup>ID</sup>, Hoda Alareesh<sup>ID</sup>

Department of Family and Community Medicine, Faculty of Medicine, Misurata University, Misurata, Libya

Corresponding email. [msaud34.ms@gmail.com](mailto:msaud34.ms@gmail.com)

### Abstract

Road Traffic Accidents (RTA) are considered a public health issue in Libya; they show a social and economic impact on the families and the country. Most studies showed that 75-95% of RTA is caused by human error, and drivers' behavior was revealed to be the main cause of road traffic accidents in many countries. Countries with low and moderate income had higher traffic death rates than high-income countries. The study aims to assess the knowledge, attitudes, and practices of the general population in Misurata city regarding traffic rules. A cross-sectional study was conducted through an electronic self-administered questionnaire composed of 17 questions regarding knowledge, attitude, and practice of road traffic regulations among the general population resident in Misurata city, Libya. The questionnaire was sent to social media groups in the period between May 1<sup>st</sup>, 2023, and December 31<sup>st</sup>, 2023. A total of 417 participants, 273 (65.5%) male and 144 (34.5%) female, 3 out of 4 questions of the knowledge domain had good scores, all three questions of the attitude domain had good scores, while 5 out of 9 questions of the practice domain had low scores. Most of the drivers are aware of the traffic rules and have adequate knowledge, which is required to form a truly safe driving environment. However, the majority are violating a number of regulations regardless of their gender, age, and educational level; they do not practice the ideal driver's behavior. This demands a strict plan and regulations to decrease the social and economic burden of these accidents.

**Keywords.** Road Traffic Signs, Regulations, Misurata City, Libya.

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### Introduction

Road Traffic Accidents (RTA) are the seventh leading cause of death worldwide; according to the World Health Organization (WHO), about 1.5 million people are killed and up to 50 million injured each year globally [1]. Libya is ranked as the third highest per capita death rate by RTA in the world, with a value of 40.5/100.000 [2]. Consequently, RTAs are considered a public health issue in Libya [2], as they have a social and economic impact on families and the country. Economic growth and social activity result in an increased number of vehicles on the roads, increasing traffic accidents in developing countries [1], with most countries losing 1-2% of their gross national product [2].

Based on notes of the traffic department in Misurata city, the total number of road traffic accidents in 2019 was 1230, the registered RTAs were 214, of which 179 were fatal, which led to 214 deaths. The Major accidents equal 116, causing 259 deaths, the total economic value of the loss is 1.727.000 Libyan Dinars [3]. During the first half of 2020, total RTAs were 331 accidents, 149 registered, 74 fatal RTAs, 88 people died, and the major accidents were 31, leading to 69 injuries, with an estimated value of losses of 658,000 Libyan Dinars [4]. Stanton and Salmon (2009) determine four primary groups of causation factors: Human conditions and states (physical, physiological, mental, emotional, experience, and exposure, Human direct causes (recognition errors, decision errors, and performance errors), Environmental factors (highway-related, ambient conditions), and Vehicular factors [5]. The transport department should provide smooth transport for the public on the roads by clearing up traffic jams, controlling pollution, providing traffic signs, and ensuring that the drivers have adequate knowledge of traffic signs, rules, and regulations before giving them a driving license [6]. Remarkably, using the seatbelt reduces the occurrence of fatal injuries to passengers by restraining the body in its original position, as serious injuries occur when passengers are thrown at each other or outside the vehicle [7].

On the other hand, driver attitude plays a major role in traffic safety. Bad behaviors such as high speed, lack of attention, driving under the influence of drugs or alcohol abuse, breaking traffic laws, and using mobile phones during driving increase traffic accidents [8]. However, RTAs are a worldwide problem facing many countries, as stated by WHO; India alone reported 73% of these road traffic accidents [6], and in Saudi Arabia the estimated number of deaths by RTA was 20,269 during 1998-2002 [9]; while in Benghazi city in Libya, Al-Jala hospital admits about 16,850 cases annually 12.9% of those cases were due to RTA [2].

Most studies showed that 75-95% of RTAs were caused by human error [10]. Driver's behavior was revealed as the main cause of road traffic accidents in many countries, according to a Malaysian study, driver's behavior contributed to 76.1% of all traffic collisions [7]. Countries with low and moderate income had higher traffic death rates than high-income countries, as the rate of fatality in low and moderate-income countries is 20.2 deaths per 100,000 populations while only 12.6 deaths per 100,000 population for high-income countries [10].

Road traffic accidents are the most common leading cause of disabilities and deaths for children and young adults in developing countries, and it may be worse if no further actions are taken [11]. Most of the developing countries showed that many drivers had a lack of knowledge regarding traffic signs and rules, poor driving practices, and negative attitudes regarding road traffic regulations [12]. This problem can be minimized by raising public awareness of traffic regulations and rules, establishing strict enforcement of traffic laws, and applying firm penalties to those who do not comply with laws. Driver's license tests should be more meticulous before issuance of the license [1,12].

It is essential to consider the knowledge and attitudes of individuals towards traffic rules as they significantly influence their driving behavior. Traffic accidents occur due to the lack of knowledge and proper attitudes towards traffic rules. Therefore, it becomes necessary to identify the baseline level of knowledge and attitudes prevalent in society. This analysis helps to identify areas of weakness and enables the implementation of interventions to improve the situation and reduce the incidence and impact of traffic accidents. This study aims to assess the knowledge, attitudes, and practices of the general population in Misurata city regarding traffic rules, and to explore whether there are any variations based on socio-demographic characteristics.

## Methods

A cross-sectional study was conducted through an electronic self-administered questionnaire composed of 17 questions regarding knowledge, attitude, and practice of road traffic regulations among general population residents in Misurata city, Libya. The questionnaire was shared through social media groups in the period between May 1st, 2023, and December 31st, 2023.

Socio-demographic characteristics included age, sex, educational level, and occupation. The sample size was calculated at a 5% margin of error and 95% confidence level and was found to be 384 participants. Data were summarized and analyzed by SPSS software version 26.

## Results

A total of 417 participants, 273 (65.5%) were male, while 144 (34.5%) were female. Most of them, 308 (73.9%), ranged from 20 to 30 years. As shown in Table 1, the knowledge level of the participants varied according to the question. 50.6% considered themselves to know the traffic rules very well. Whereas 42.9% had average knowledge of the penalties for traffic rule violations. On the other hand, 56.6% do not know the range of legal speeds on different city roads. Among the participants, 95.5% know the signs on roads and intersections well.

*Table 1. Percentage of participants who responded with the right answers for each question of the knowledge sector.*

	Knowledge	Percentage of right answers
Q1	How well do you know traffic rules?	96.4%
Q2	How well do you know the penalties for traffic rule violations?	91.6%
Q3	How much do you know about the legal speed limit on city roads?	43.4%
Q4	How well do you know the signs on roads and intersections?	95.5%

About 54.4% of the participants explained the driver's failure to comply with traffic laws and rules as the main reason for the large number of traffic accidents in Libya. Overall, 94.5% think that adhering to traffic rules is important to prevent accidents. Additionally, 71.9% think that wearing a seat belt reduces injuries in traffic accidents. Furthermore, 69.5% think that having a fire extinguisher cylinder in every car is necessary.

**Table 2. Percentage of participants who responded with positive answers for each question of the attitude sector.**

Attitude		Percentage of positive attitude
Q6	Do you think that adhering to traffic rules is important to prevent accidents?	94.5%
Q7	Do you think that wearing a seat belt reduces injuries during traffic accidents?	71.9%
Q8	Do you think that having a fire extinguisher cylinder in every car is necessary?	69.5%

Regarding the speed of driving, 39.6% of the participants drive sometimes faster than the legal limit, and 24.7% drive rarely faster. In addition, 79.6% had a driving license. About 77.5% do perform a technical inspection on their car every period in accordance with the law. As for the insurance and license plate, 77.7% and 7.2% had insurance and no license plate for their car, respectively. In total, of 52.3% did drive a car when they were under the age of 18 years old. A majority of 46.3% do not wear the seat belt when driving, and 41% of the participants stated rarely driving on a red light. Moreover, 64.7% do sometimes use their phone while driving.

**Table 3. Percentage of participants who responded with positive answers for each question of the practice sector.**

Practice		Percentage of positive practice
Q9	Are you driving faster than the legal limit?	56.9%
Q10	Do you have a driving license?	79.6%
Q11	Do you perform a technical inspection on your car every period of time in accordance with the law?	77.5%
Q12	Do you have insurance for your car?	77.7%
Q13	Does the car you drive have a license plate?	92.8%
Q14	Have you ever driven a car when you were under 18 years old?	52.3%
Q15	Do you wear a seat belt when driving?	31.9%
Q16	Do you run on a red light while driving?	30.7%
Q17	Do you use your phone while driving?	64.9%

Calculated knowledge, attitude, and practice in correlation with social demographic characteristics are shown in Table 4.

**Table 4. Knowledge, Attitude, and Practice in correlation with social demographic characteristics**

Question	p-value (Gender)	p-value (Age)	p-value (Education)
Q1	0.003*	<0.001*	0.148
Q2	0.002*	<0.001*	0.019*
Q3	0.349	<0.001*	0.044*
Q4	0.002*	0.019*	0.097
Q5	0.077	0.180*	0.119
Q6	0.055	0.754	0.073
Q7	0.162	0.104	0.042*
Q8	0.002*	0.035*	0.174
Q9	<0.001*	0.366	0.031*
Q10	<0.001*	<0.001*	<0.001*
Q11	0.990	<0.001*	0.326
Q12	0.007*	0.004*	0.561

Q13	Does the car you drive have a license plate?	0.147	0.303	0.172
Q14	Have you ever driven a car when you were under 18 years old?	<0.001*	0.062	0.023*
Q15	Do you wear a seat belt when driving?	<0.001*	0.012*	0.009*
Q16	Do you run on a red light while driving?	<0.001*	0.011*	0.033*
Q17	Do you use your phone while driving?	<0.001*	0.409	0.025*

\*Statistically significant (P-value less than 0.05 was considered statistically significant).

## Discussion

This study investigates the relation between knowledge, attitude, practice, and road traffic accidents in Libya. So far, only studies have been conducted to know the extent and amount of the problem of traffic accidents in Libya, gathering numbers of accidents, death tolls, and injured passengers without investigating the real cause behind the disastrous high rates of accidents and the proper way to solve them. Identification of risk factors is essential to set and frame solutions for this problem. This has formed a literature gap that this study has tried to throw the spotlight on. Road traffic accidents in Libya are considered to be a public health problem. There is an increase in the number of casualties and victims, most of them young people. Traffic accidents claimed between the years 2018 and 2022 alone on the roads in Libya, the lives of 9245 people, in an indication of the high rates of continued bleeding roads compared to the years before [13].

Through our study, we have found that most of the participants are aware of the traffic rules and have adequate knowledge that is required to form a truly safe driving environment. However, the majority are violating a number of regulations regardless of their gender, age, and educational level; they don't practice the ideal driver's behavior. However, Libya does have a legal framework in place for traffic regulations. The key piece of legislation is Decree No. (247) of 1994 regarding the specification of the provisions and rules on traffic, traffic signals, and traffic etiquette (Libyan traffic laws). This decree outlines a variety of rules, including those related to speed limits, traffic signals, vehicle documentation, and others [14]. In reference to our data, 50.6% of the participants claimed to know traffic rules very good even the ones with a lower educational level. This is in contrast with other studies, where they claimed a lack of knowledge as one of the possible causes of rising road accidents [15].

The main cause of traffic accidents, according to the participants, was the driver's failure to comply with traffic laws and rules (54.4%) and exceeding the legally specified speed limit (27.3%). This is consistent with data from the Global Road Safety Facility, where they also highlighted the potential decrease of tragic road accidents to four times, if safe system speed limits were enforced [16]. Driver errors remain the most significant factor in increasing or decreasing the rate of RTAs [17]. The overwhelming majority of participants are aware of the ways to decrease traffic accidents. Adhering to traffic rules, wearing a seat belt, and having a fire extinguisher cylinder in the car. Even though most of the participants went through driver's license examination and own a driving license, 39.6% of them sometimes drive faster than the legal limit. Most of them were young male drivers. Implementation of strict laws on car documents, such as insurance, technical inspection, and license plates, has been present in drivers' practices. Nearly all of the drivers aged 40 years and above own a driving license, a license plate, insurance, and perform regular technical inspections on their vehicle.

Alarmingly, almost half of the drivers do not wear a seat belt while driving. Although the vast majority agreed that wearing a seat belt reduces disabilities and injuries. The highest rate of drivers who don't wear is between the ages of 20 and 30 years. According to the Libyan Ministry of Interior, 11532 drivers and passengers were severely injured between the year 2018 and 2022 alone. This not only leaves disabilities and losses of human lives, but also a national economic burden on the government. It has been estimated that the fatalities and serious injuries have been valued at more than 2,2 million US dollars in 2016 itself [18].

## Recommendations

In order to decrease the massive amount of car accidents and improve the attitude of the drivers and pedestrians, there should be recognition from the government of the problem. An ideal solution should involve multiple ministries, especially the Ministry of Education and transportation. The proper way to raise awareness is by educating school students about the correct behavior of pedestrians on the streets. Additionally, emphasis on the use of seat belts and child seats could be easy and simple, but effective in reducing the number of victims of traffic accidents and injuries. Furthermore, retraining and educating operators of vehicles, to ensure drivers who are entering the system are endowed with the necessary skills, and applying a firm penalization to those who do not comply with laws.

Road quality is one of the significant contributing factors that lead to road accidents. To reduce the severity of injuries, investing in road infrastructure with good design, road planning, regular revalidating road markings, road humps, traffic lights, road mirrors, and road signs can lead to significant RTA reductions. Enforcement is a powerful tool for changing motorist behavior in the quickest way possible, as it bypasses the process of changing the attitude of the individual [19].

## Conclusion

Road traffic accidents in Libya are considered to be a public health problem. There is an increase in the number of casualties and victims, most of them young people. Most of the drivers are aware of the traffic rules and have adequate knowledge that is required to form a truly safe driving environment. However, the majority are violating a number of regulations regardless of their gender, age, and educational level; they don't practice the ideal driver's behavior. This demands a strict plan and regulations to decrease the social and economic burden of these accidents.

*Conflict of interest.* Nil

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