

Driving literacy and distracted driving southern Saudi Arabia experience

Ali Al-Bshabshe,
Tarique Hussain Ashraf¹,
Mohammed Dwaima²,
Muhammed Abid³,
Mueed Al-Harhi⁴

Departments of Internal Medicine and ¹Surgery, College of Medicine, King Khalid University, ²Department of Medical Education, College of Medicine, King Khalid University, Abha, ³Department of Medicine, King Fahad Medical City, Riyadh, ⁴Department of General Medicine, Khamis General Hospital, Khamis Mushit, Saudi Arabia

Abstract

Background: Driving is a psychomotor activity that requires a combination of concentration and good visual and auditory functions. It is very important for drivers to be attentive while driving to avoid car accidents. Distracted driving is an act of driving while engaged into other activities such as looking after children, texting, talking on the phone or to a passenger, watching videos, eating, or reading that takes the attention of driver away from the road. **Objective:** To evaluate the driving literacy among students and teachers regarding distracted driving namely the use of mobile phones (texting and talking) while driving and compare them. **Methods:** This is a cross-sectional, questionnaire-based study that contains open-ended, close-ended, and likert scale items. The study took place in Abha City of Aseer Province, KSA from October 1, 2014, to December 31, 2014. **Results:** 72% of all respondents were answering the calls while driving. On comparing teachers and students, 77% of students were making calls while driving as compared to 44% of teachers. 56% of the respondents were doing complex tasks like reading a text message while driving. Nearly half of the respondents (48%) did not consider the usage of mobile while driving as dangerous action. **Conclusion:** Proper education regarding distracted driving is the need of hour and it should be started from primary schools. Social media, newspaper, television can be used to increase the awareness. There should be strict laws to ban the use of mobiles and other distracted driving activities while driving.

Key words: Accidents, car, distracted driving, driving, literacy, mobile

INTRODUCTION

Driving requires a combination of various cognitive, physical, sensory, and psychomotor skills. It is very important for drivers to be attentive while driving to avoid car accidents. Distracted driving is an act of driving while engaged into other activities such as looking after children, texting, talking on the phone or to a passenger, watching videos, eating, or reading that takes the attention

of driver away from the road. Driver distractions occur both when a driver is looking away from the forward roadway (e.g, Inside or outside the vehicle), or looking at the forward roadway but not attentive (e.g, involved in a cell phone conversation).^[1] Any activity which demands driver's attention while driving has the potential to have serious consequences for road safety. People have tried to define distracted driving, but there is no uniform definition some how it is define as a driver distraction occurs when a driver is delayed in the recognition of an information needed to safely accomplish the driving task because some event, activity, object, or person within or outside the vehicle compelled or tended to induce the drivers

Address for correspondence:

Dr. Tarique Hussain Ashraf, Department of Surgery, King Khalid University, P. O. Box 25216, 1416, Abha, Saudi Arabia.
E-mail: tarique536@yahoo.co.in

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shifting attention away from the driving task.^[2] As per one study if there is no negative effect of the secondary task on driving performance or control than distraction has not occurred.^[3] People have differed in the definition of distracted driving, but everyone is of the view that it increases the risk of accidents. Over half of inattention, crashes are attributed to distracted driving.^[4,5] The risk of being involved in an accident for using mobile while driving in crash is 38% higher as compared to those not using mobiles. Distracted driving is said to be associated with an increase of breaking distance by 30%, shrinkage of field of vision by 75%.^[6] An interesting aspect of distracted driving is adaptive strategies drivers adopt when they are distracted to maintain their driving performances. One of the adaptations is decreasing speed while using mobiles while driving and avoiding risky maneuver's like overtaking while talking on phone.^[7] Driver distraction results into a catastrophe when these adaptive strategies fail. The reason for failure of adaptive strategies is either the secondary task is so complex that drivers fail to give the due attention to driving, for example, solving arithmetic problem on mobile while driving or the demands of driving are very high like driving on a curvy road.

With the latest technologies such as wireless navigation system, mobiles, internet into cars the preoccupation with electronic devices while driving is increasing at a great pace.^[8] The increased use of mobile phones while driving is one of the most common distractors now a day [Table 1].

All distractions comprise the safety of the driver, passengers, bystanders, and those in other vehicles. In this study, we aim to find out what the teachers and students think regarding distracted driving, use of mobiles and do they consider these as risk factors for road traffic accidents (RTAs).

Purpose of study

To evaluate the driving literacy among students and teachers regarding distracted driving namely the use of mobile

Table 1: Different types of distractions and their definitions

Distractions	Definitions
Visual	Focus on target other than road for an extended period, for example, looking at a magazine or a co-passenger while driving
Auditory	Focuses on auditory distraction like listening to song
Physical	When someone removes one or both the hands off the steering for an extended period
Cognitive	Any thought distracting drivers attention off the road in spite of him looking at the road. For example, talking on mobile via Bluetooth

phones (texting and talking) while driving and compare them.

METHODS

In this cross-sectional study, a purposely constructed questionnaire was distributed to teachers and students of various grades in ten schools in the southern region of KSA to look for their responses regarding distracted driving. The questionnaire included:

- What do you do when you receive a call?
- Do you receive a call while driving?
- Do you consider using mobile while driving to be dangerous?
- What do you do when you receive a call while driving?

The study was approved by the ethical committee of the college of medicine, Then the study was conducted from October 1, 2014, to December 31, 2014. The students were divided into three groups depending on their class level.

Data were entered and analyzed using the the IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp. descriptive statistics was obtained, i.e., frequency and percentages.

- Students of primary school Grade 4 and above
- Students of intermediate school
- Students of secondary school.

And School teachers with bachelor degree being their basic degree.

Exclusion criteria—age of <10 years and those not driving by themselves.

RESULTS

A questionnaire was distributed to 418 candidates (students and teachers) trying to evaluate the distracted driving namely the use of mobile phones (texting and talking) while driving.

Out of 418, 359 (85.7%) were students and 59 (14.1%) were teachers

The age distribution was such that 81.62% of our volunteers were of the age group of (16–21) years.

13.6% were of the age group of (22–27), and only 0.48% of the respondents were in the age group of (34–39) years.

The education level comparison showed that out of 359 students, 15, 10, and 334 were respectively of the primary,

intermediate, and secondary level. The teachers who were 14.1% of the study group were having bachelor's degree as the minimum qualification.

On enquiring about what they do when they get a call while driving, 72% of all respondents (teachers + students) were answering the calls, 17% were ignoring the calls, and only 11% were pulling over the car and answering. When we compare this figure in the various groups, we found only 44% (26/59) of teachers were answering while driving while 275/359 students (76.6% of all students) were answering the call while driving.

On asking a direct question, whether they answer the call while driving, the response was as depicted in Figure 1. 213/418 (51%) of the respondents were always answering the calls and only 7% of them never answered the calls while driving and 42% were answering sometimes.

When asked whether they consider talking on mobile to be dangerous [Figure 2] 26% (108) of total respondents strongly denied any relationship between accidents and talking on a mobile. Out of 108 respondents, 15 were teachers and 93 were students. A total of 91 respondents (22%) were disagreeing to the fact that talking on mobile increases the accident rate, but their opinion was not very firm. Hence, a total of 48% respondents did not think talking on mobile to be a major factor while driving.

A total of 219 (52%) respondents (39 teachers +180 students) were of the views that talking on mobile increases the accident rate.

When they were enquired about texting during driving 33.5% of the respondents (140) were not opening the message, and 56% (234) were reading the message but not replying while 2 (0.48%) were opening and replying to it. There were 10% of people who were pulling the car over to read or reply the message. Among the teachers 47.5% did not open the message while 37% opened but did not reply, and 15% actually pulled the car by side to read or

reply while among the students 73% of primary, 70% of intermediate, and 58% of secondary school students were opening the message but not replying while only two students of secondary school were replying while driving. When asked regarding their opinion regarding the role of texting to accidents, overall 52% agreed and 39% strongly agreed it to be a cause of accidents. Only 9% did not blame texting to increase the accidents rate. Among the teachers, 73% agreed and 14% strongly agreed about texting as a cause of accidents.

Figure 3 shows that 14% of the teachers and 8% of secondary, 7% of primary, and 10% of intermediate students did not think there was any relation between accidents and texting.

DISCUSSION

Many factors can affect drivers while on road and Literature shows that in Saudi Arabia like other countries, driver factor was considered as the major factor responsible for accidents.^[9] 80% of the accidents were attributed to drivers in Saudi Arabia^[9] together with vehicular and environmental factors human factors is considered to be responsible for 92% of accident^[10] while Lee reported 84% accidents rate due to driver factor as well.^[11] Hence, all the factors, which affect drivers, such as alcohol intake, experience, age, distracted driving should be seen as an important factor for causing RTA.

The deleterious effects of cell phone use on simulated or instrumented driving performance is an established fact^[12,13] and using cell phones while driving has been linked to increases in crash risk^[14] and near-crash risk.^[15] Aha Hussein and his group observed that 52% of 2469 drivers surveyed in cities of eastern Saudi Arabia had been involved in RTA, and 60% of them used mobile phones while driving.^[16] In another study, the relative risk of involvement in RTA in drivers who called while driving was about 7 times greater than drivers who did not.^[17]

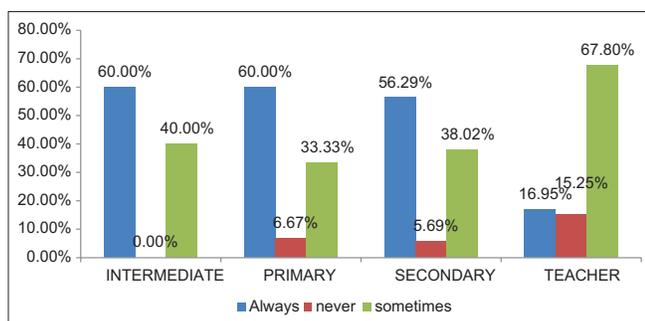


Figure 1: Do you answer the phone while driving?

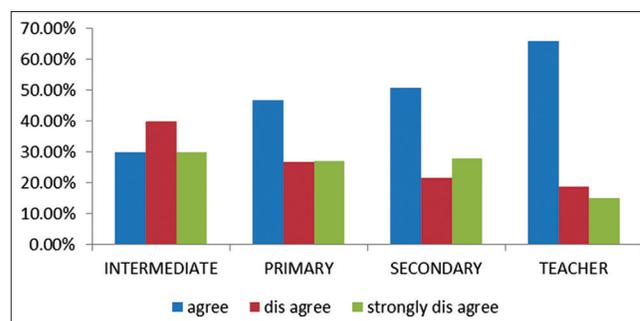


Figure 2: Whether answering calls while driving leads to accidents?

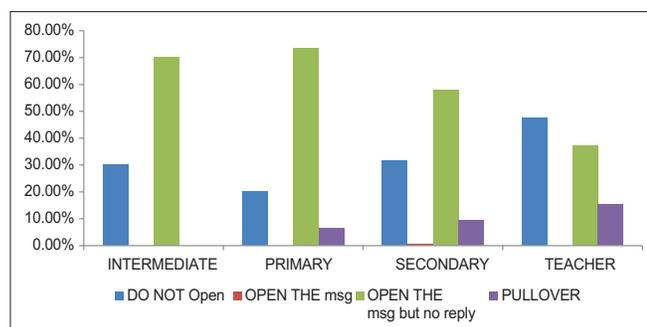


Figure 3: What do you do when you receive text message while driving?

In other studies, cell phone conversation while driving was shown to increase collision risk in drivers by about 4–6 times.^[1,16,18] A retrospective study from Toronto on 699 drivers who were involved in a crash suggested that risk of using mobile phone while driving was associated with 4 times more risk of crash and they also found no advantage of hand free phone over handheld phone.^[15] In a similar retrospective study by violanti (1998) using data from 223,137 crashes (1992–1995) he concluded that a mobile phone was present in 4% of vehicles having a fatal crash and in these crashes about 8% of drivers were using mobile at the time of crash. They concluded drivers who were using mobile was 9 times more chance of having a fatal crash.^[19]

There are various explanations given for increased RTA due to cell phone. Driving requires a combination of various cognitive, physical, sensory, and psychomotor skills. Talking on phone “causes inattentive blindness” that is, the person in spite of looking miss important signs, traffic signals. Cell phone conversations have negative effects on reaction time, lane keeping, car-following ability, and speed control while driving.^[20] Furthermore, distracted drivers are reported to accept suboptimal performance on driving tasks, like checking mirrors, to give attention to nondriving tasks.^[3] All of these factors together contribute to a higher collision risk.

Age is an important factor, which has been related to RTA. In this study, 81.6% of drivers are of age group of 16–21 years. Teenagers are inexperienced drivers and more likely than adults to engage in risky driving behaviors^[21,22] also they had an elevated fatal and nonfatal crash risk relative to adults.^[23] Similarly, in Saudi Arabia many studies found age to be significantly associated with the occurrence of RTA.^[16,18] In a similar questionnaire-based study among students of medical college in Aseer region^[24] the writers found that the average age was 21 years, and about 50% of students had suffered RTA, and there was an injury to 22% of patient and 13% of the RTA patient was admitted for

9 days. Thus, we can say that in this study most of the respondents are at a risk of RTA.

The number of drivers using mobile is directly proportional to the number of mobile users in any country. In a 2011 survey of a representative sample of 6,002 drivers, 93% of 18–20-year-old drivers said they own cell phones^[25] In a united nations survey (2013) Saudi Arabia has got the highest no of mobile users worldwide with children as small as 9 years using mobiles. Hence, we are not surprised to see almost all of the respondents having mobile with them in this study. We found 72% of all the participants making calls while driving. In a similar study in Saudi Arabia, 53.9% (280/520) of the respondents sometimes or always made/received phone calls.^[17]

We found 76.6% of students overall answering the call while driving while only 44% of teachers were using mobile while driving. In all the studies, we find that the number of mobile users while driving decreases with increasing age, this can be explained by the fact that with age comes maturity though there are some studies which suggest this less usage of mobiles by higher age group, may be a compensatory mechanism. Research has shown older drivers driving performance is impaired to a greater degree as compared to young drivers when using nubile phone and this may be a compensatory mechanism that many older persons choose not to use mobile phone at all.^[26,27]

On breaking up the figures among students, the percentage of students answering the calls were 80%, 90%, and 76% respectively for the primary, intermediate, and secondary level. When we compare from other studies, we found that 52% of students were chatting^[28] as compared to 43% in another study.^[25] In 2013, in a survey 58% of 16–18-year-old drivers were agreeing to receive or making calls while driving.^[29] We are finding higher number of students in this study using mobiles while driving as compared with other studies. This can be explained by the fact that most of the other studies with which we are comparing are few years older, and the use of mobile is increasing day by day. Teen drivers were approximately 50% more willing to engage in distracting activities than older drivers.^[30] This may explain the higher use of mobiles while driving by younger age groups.

Thus, we see quite a high number of young students making calls while driving. It can be explained by the fact that mobiles are now days considered a necessity and nearly 100% of the respondents have mobile. In comparison, we see 44% of teachers (age more than 30) and with minimum bachelor’s degree making/receiving the calls while driving. The figure of 44% is still high but in comparison to

students, it is less. It has been seen in various studies that with age and maturity, people have less risky behavior.

When asked regarding messages during driving, approximately 56% of the respondents were opening the messages but they were not replying. Among this 56% (234) only 22 (9.4%) were teachers while rest 90% were students. The various studies done showing the frequency of messaging while driving are 26%,^[28] 17%,^[25] and 38.5%.^[17] 39% texted at least once in last 30 days was the observation of Hamilton *et al.*^[29] while 45% texted within 30 days was the observation by Olsen *et al.*^[31] In the 2011 Youth Risk Behavior Survey of over 15,000 US high school students, approximately 45% of students 16 years and older said they had texted while driving in the past 30 days, and 11% texted while driving in the past 2 days.^[32] The high number of those who are messaging in this study may be explained again by the fact that no of mobile user has increased as compared to the past.

Texting while driving was considered as an indicator of the overall pattern of risky behaviors in a study. Texting while driving in the past 30 days was associated with other risky behaviors such as irregular seat belt use, driving after drinking, and riding with a driver who had been drinking.^[31] Thus, texting while driving can be considered as an independent risky behavior while driving.

In a study^[17] in KSA author reported 5 times increased chances of RTA while more alarming results have been reported in naturalistic driving study in Virginia Tech Transportation Institute^[32] which found a 23.2 times increase in crash or near-crash risk when reading and sending text messages. In another simulated experiment, it was shown that drivers who text message while driving display poorer car-following ability and lateral lane control^[33] and spend 400% more time with their eyes off the road when compared with baseline.^[34]

As compared to students, we see very less number of teachers messaging while driving. It can be explained by more risky behavior of students, teenagers but the comparison of teachers and students regarding mobile usage has given a mixed results. The 2011 national survey of distracted driving found that drivers 18–20 years old and 21–24 years old were more likely than drivers 25 years and older to report sending or receiving texts or E-mails,^[25] but were less likely than drivers ages 25–54 to report receiving/making phone calls. In the 2013 national survey, 57.8% of drivers 16–18 years old said they had talked on a cell phone while driving at least once in the past 30 days compared with 72.2% of 19–24 years old, 82.0% of 25–39 years old, and 71.9% of 40–59 years old who said the same. In addition, 39% of 16–18-year-old

drivers said they had read a text or E-mail or sent a text message while driving at least once in the past 30 days, compared with 42.4% of 19–24 years old, 55.5% of 25–39 years old, and 23.7% of 40–59-year-old drivers.^[29] Thus, we can conclude that usage of mobiles during driving is not limited to teenagers only and many studies show adults also having same behavior regarding use of mobiles and sometimes their percentage of using is more as compared to teenagers.

Seeing mobile use as a big health hazard, almost all the US states have implemented laws prohibiting drivers from talking on phones and/or texting.^[35] Initial studies suggested that handheld phones adversely affected driving performance and as a result many countries such as the UK, Italy, Brazil, Australia, and several states of the USA banned the hand-held mobile while driving. The main risk of handheld mobile use was attributed to the physical interference caused by handling and manipulating the phone. In California State of the USA with the ban of using handheld mobile, the vehicle accident fatalities decreased by 22% while deaths caused by drivers using hand-held cell phones fell by 47%.^[36,37]

However, many studies have concluded that hand free mobiles are not safe and mobile use overall should be banned. Hands-free mobile phone while driving resulted in 4 times more likelihood of a serious crash^[38] and many studies have suggested that the use of hands-free device was rarely better than when using a handheld phone.^[1,7,38] They, therefore, suggested that it is the cognitive task of having the cell phone conversation that is distracting, regardless of the device. Hands-free devices are therefore not risk-free as many believe, and can impair the driver's ability to react swiftly and safely because there is still a mental distraction and causes cognitive distraction.

In spite of various studies in almost all part of the world, 21.8% disagreed and 26% strongly disagreed as to using mobile has any effect on accidents. Thus, approximately 48% of the respondents are not aware or are deliberately denying the fact that it leads to increase of accidents. Drivers are often not aware of the detrimental effect of distracted driving, and they underestimate the risks involved particularly in relation to their own crash risk relative to their peers.^[39]

There is a provision of fine of 150 Saudi Riyal for those involved in distracted driving for the last many years^[40] but this law is either not implemented strictly, or the fine is too low to prevent the drivers from distraction. More research is needed for other forms of distracted driving like eating/drinking as most of the studies have concentrated on the mobile use.

Limitation of study

The study did not cover all the schools of southern Saudi Arabia.

It is a questionnaire-based study.

CONCLUSION AND RECOMMENDATIONS

1. Despite so many studies people do not regard use of mobile while driving as a hazard
2. There should be strict laws for banning the use of mobiles while driving
3. The students as compared to teachers are more at risk of indulgence into distracted driving
4. A proper education regarding distracted driving is the need of hour, and it should be started from primary schools level, media, newspaper, and other social media sites can be used to increase the awareness
5. The other distractors like eating/drinking should be discouraged.

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Nil.

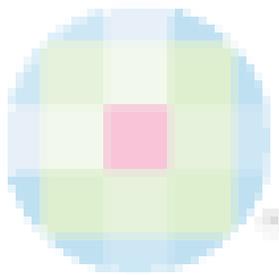
Conflicts of interest

There are no conflicts of interest.

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