



## RESEARCH ARTICLE

### PREVALENCE AND DETERMINANTS OF RISKY DRIVING BEHAVIOURS AMONG MALE WORKERS IN PRIMARY HEALTHCARE CENTERS IN JEDDAH CITY, SAUDI ARABIA

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#### ABSTRACT

**Background:** In Kingdom of Saudi Arabia, road traffic deaths accounts for 4.7% of all mortalities. Several studies have demonstrated that the human factor is the major contributing factor to RTAs, and then vehicle and road factors.

**Objectives:** To determine the overall prevalence of risky driving behaviours, perception toward this behaviour and determine the related factors among male workers in primary healthcare centers in Jeddah.

**Subjects and Methods:** It was a cross-sectional study carried out among a randomly selected sample of currently driving male workers in primary health care centres in Jeddah. Self-administered questionnaire was utilized for collecting the data regarding socio-demographic characteristics, driving history, and engagement in risky driving behaviours as well as their perception regarding these behaviours.

**Results:** The study included 222 male workers aged 20-62 years. Majority of the participants (91.9%) had a driving license. Nearly three-quarters of the participants (75.2%) had history of road traffic accidents. (61.7%) state that they either always/often were using seat belt while driving inside the city whereas (63%) were using it always/often in high ways. Almost one third of Male (32%) was always/often using mobile phones by hands while driving. Overall, the risky driving behaviours score ranged between 32.86% and 84.29% with a mean±SD of 59.80±9.41%. The score was higher among postgraduate (p=0.001), male workers who reside outside Jeddah (p=0.039) and non-smoker Male workers (p<0.001). Therefore, they had less engagement in risky driving behaviours.

The most dangerous risky driving behaviours as perceived by them were putting the children on the driver's lap while driving (weighted mean on a scale ranged between 1 and 5 was 4.45), exceeding speed limits within residency/school zones (weighted mean=4.41), driving in a speed exceeding speed limit by more than 25 km (weighted mean=4.28), and using cell phones with hands while driving (weighted mean=4.28). General practitioners had the highest percentage of perception of risky driving behaviours score (mean rank =148.02), p=0.019.

**Conclusion:** The male workers in primary healthcare centers in Jeddah reported relative frequent engagement in some risky driving behaviour. There was a correlation between risky driving behaviours and perception regarding them.

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## INTRODUCTION

Road traffic accidents (RTAs) have increased to become a global burden. The World Health Organization (WHO) reported about 1.25 million death people each year as a result of road traffic accidents, and between 20 and 50 million RTAs related injuries globally. Therefore, In September 2015, heads of state attending the United Nations General Assembly implemented the historic Sustainable Development Goals

(SDGs). One of the new SDG goals is to halve the worldwide number of deaths and injuries from road traffic accidents by 2020 (Bash, 2015). In the Kingdom of Saudi Arabia, road traffic deaths accounts for 4.7% of all mortalities. Whilst road traffic fatalities do not exceed 1.7% in Australia, United Kingdom, or United States of America. (GCC 2012) According to the Ministry of Health hospitals reports, 81% of mortality in the hospitals are due to RTIs, and 20% of beds are occupied by RTA injured (Ansari et al., 2000). Several studies

have demonstrated that the human factor is the major contributing factor to traffic accidents, and then vehicle and road factors. In addition, many studies reported that young drivers whom are the economically productive age group are the most victims of traffic accidents around the world. Similarly, Most of all studies conducted in the last 2.5 decades in Saudi Arabia had shown young males affected more than females. Considering the gender difference is explained by giving current driving laws in our country (Mansuri *et al.*, 2015).

### Driving behaviours in Saudi Arabia

There were different ambiguous definitions for risky driving throughout literatures. Subsequently, Dula and Geller in 2003 adopted an explicit consistent definitions for risky driving behaviours s stated that is "a dangerous behaviours s performed without intent to harm self or others includes, such behaviours s as speeding, general tailgating, running red lights, weaving through traffic, maneuvering without signaling, and frequent lane changing" (Dula and Geller, 2003). Moreover, that is the adopted operational definition in this current study. One of the most significant approaches in prevention traffic accidents is to promote the safety driving measures and behaviours s. Yet in Saudi Arabia, we have a lack of comprehensive study that include the different patterns of driving behaviours s. As in research studied 520 drivers at AR-Riyadh, Al-Ahsa and Ar-Deriyah, found that 53.9% of them sometimes or always made/received phone calls, 38.5% read or sent text messages while driving. However other important risky driving behaviours s not examined (Osugwu *et al.*, 2013). Moreover, in a study conducted in Abha assessing the knowledge, attitudes, and practices of male students towards road traffic regulations found that more than 50 % had been involved in RTAs. More than 75% of the students having troubles with seat belts using, forgetfulness, and anxiety were the most common problems (Ym, 2006). In another study conducted among drivers from Dammam, Al-Khobar, Qateef, and Jubail. The results indicated 52% of them had previous RTAs; 75% were seat belt compliant, and 60% used mobile phones while driving (Aba Hussein and El-Zobeir, 2007). In a study among drivers in Jeddah, the results indicated that the drivers, in general, prefer to drive at higher speeds and could be considered as more aggressive compared to the drivers in the United States (Hasan *et al.*, 2014). Another study in Iraq found most of the medical students who engaged in risky driving behaviours prefer these behaviours (Shabila *et al.*, 2015). This raising an important issue not only for their health and safety but also if they involved in risky driving behaviours, they are in a weak position to counsel their patients in future regarding these behaviours. Risky driving behaviours are significantly associated with involvement in car accidents. However, there is a lack of research studied risky driving behaviours in Jeddah. Therefore, the current study aims to provide in-depth insights of the magnitude and pattern of risky driving behaviours among male workers in primary health care centers in Jeddah.

### Equipment and methods

A cross-sectional study targeted male workers in primary health care centers in Jeddah; a city in Kingdom of Saudi Arabia located in the middle of the eastern coast of the red sea and is considered the economic and tourism capital of the country. The inclusion criteria as follow: All male working in primary care centers aged 18 years old and above whom

currently driving including physicians, nurses, technicians, office workers, and drivers. An estimated average number of male working in one primary health care centers is 15. In Jeddah, there are 46 primary health care centers. And the total population of interest is around 870 male workers. Using Raosoft calculator (<http://www.raosoft.com/samplesize.html>), by giving ER: 5%, C.I: 95%, population size: 870 and estimated prevalence of risky driving behaviours: 50%. The recommended sample size is 267. Through a multi-stage stratified sampling technique; the 46 primary Health care centers in Jeddah are distributed under five main health sectors. Therefore, the 267 male workers will be taken from 20 primary Health care centers. Finally, four primary Health care centers will be selected from each health sectors by using the simple random technique.

A self-administered questionnaire in Arabic language was constructed based on a thorough review of relevant literature to achieve the objective of the study.

It consists of four sections:

- (1) Demographics data include age, marital status, education level, residence, job description, and income per month.
- (2) Driving history contain question about having a driving license, duration of car driving (years), history of ever having RTAs and death of a family member/relative because of RTAs.
- (3) Engagement in risky behaviours during driving.
- (4) Perception of participants regarding some risky driving behaviour.

Pilot study was done on 10% of the sample size only, in two primary health care centers which not included within the actual study. A pilot study was carried out with the application of the full methodology and analysis of results. The method, the feasibility, questionnaire wording and duration were assessed. Necessary changes were made before finalizing. Both the study protocol and questionnaire were approved by the Department of Medical Research and Studies, Directorate of Health Affaires, Jeddah, Ministry of Health. Written consents from all participants were obtained through a question written on the front page of the questionnaire that (are you agree to participate in this study? - Yes - No). All information was kept confidential and was not be accessed except for the purpose of scientific research. Moreover, there was no conflict of interest. Statistical analysis was carried out using statistical program for social sciences (SPSS), version 22. With P –value < 0.05 was considered for significance. Statistical tests used is Shapiro-Wilk test to explore the variable distribution, student's t and ANOVA tests to compare means of one normally distributed variable between two or more than two groups, respectively, Mann-Whitney and Kruskal-Wallis tests to compare abnormally distributed variable between two or more than two groups, respectively, and Spearman's correlation coefficient to test for the correlation between scores of risky driving behaviours and perception regarding them.

## RESULTS

### Demographic characteristics

The study included 222 male workers. Their age ranged between 20 and 62 years with a mean of (35.6 ± 7.5 SD). More

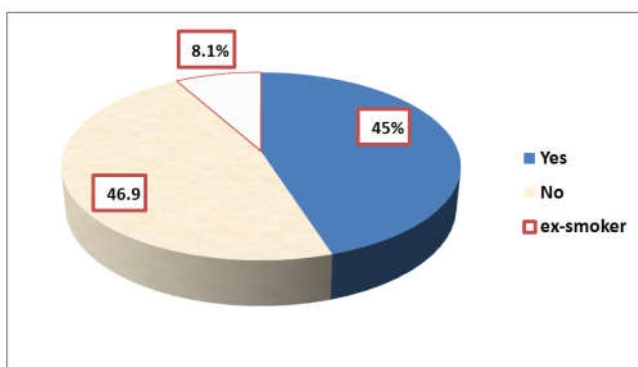
than half of the participants (53.3%) aged between 31 and 40 years. Majority of them (83.3%) were married. Almost half (46.8%) were university graduates. The Vast majority of them (97.2%) reside in Jeddah. Administrative workers represent 42% of the participants whereas nurses and general practitioners represent 12.4% and 12.9% of them, respectively. The income exceeded 10000 SR/month among 60.4% of the participants whereas it was 3000 SR/month or less among 3.7% of them

**Table 1. Demographic characteristics of the participants (n=222)**

	Categories	Frequency	Percentage	
Age in years	20-30	59	27.8	
	31-40	123	53.3	
	41-50	29	13.7	
	>50	11	5.2	
Marital status	Married	185	83.3	
	Single	31	14.0	
	Divorced	6	2.7	
Education	Intermediate school/less	12	5.4	
	Hugh school	31	14.0	
	University	104	46.8	
	Diploma	64	28.8	
	Postgraduate	11	5.0	
Residence	Jeddah	216	97.2	
	Outside Jeddah	6	2.8	
Job	Nurse	27	12.4	
	Administrative	96	42.0	
	Lab technician	10	4.6	
	Pharmacist	26	12.0	
	General practitioner	28	12.9	
	Dentist	18	8.3	
	Others	17	7.8	
	Income (SR/month)	≤3000	8	3.7
		3001-5000	17	7.8
	5001-10000	61	28.1	
	>10000	136	60.4	

### Smoking history

45% of the participants were currently smokers and 8.1% were ex-smokers (Figure 1).

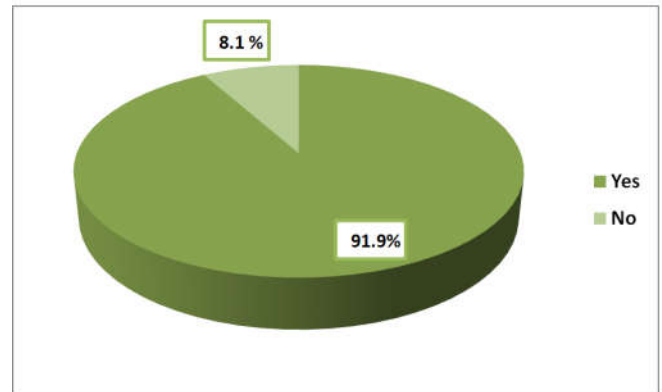


**Figure 1. Smoking history among the participants**

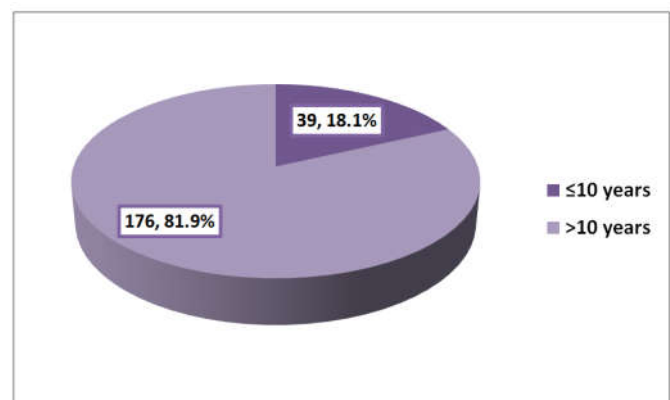
### Driving history

The majority of the participants (91.9%) had driving license (Figure 2) and most of them (81.9%) drive for more than 10years (Figure 3). Nearly three-quarters of the participants (75.2%) have had a history of being involved in road traffic accidents; (29.2%) had it only once, (21.6%) had it twice. however, 12.2% of them had more than 3 RTAs. Among those who reported RTAs (n=167), only 14 (8.4%) reported physical injury as a result of the accident. Half of those reported

physical injury (n=7) were admitted to a hospital as a consequence of RTAs. Duration of the hospital stay exceeded 10 day among two cases representing 28.6% of admitted cases. History of death of a family member/relative because of RTAs was mentioned by 26% of the participants. Number of deaths exceeded 3 among 24.5% of those reported death of family member/relative because of RTAs (Table 2).



**Figure 2. History of having a driving license among the participants**



**Figure 3. Duration of car driving among the participants**

**Table 2. Description of the driving history among the participants**

	Responses	Frequency	Percentage
History of ever having RTAs	Never	55	24.8
	Yes, once	65	29.2
	Yes, twice	48	21.6
	Yes, trice	27	12.2
	Yes, more than three times	27	12.2
If yes, did that accident cause any physical injury	Yes	14	8.4
	No	153	91.6
History of hospital admission as a consequence of RTAs	Yes	7	50.0
	No	7	50.0
Duration of hospital admission (days)	≤10	5	71.4
	>10	2	28.6
Death of a family member/relative because of RTAs	Yes	57	26.0
	No	165	74.0
Number of deaths in family/relative due to RTAs	One	25	43.9
	Two	12	21.1
	Three	6	10.5
	>three	14	24.5

### Behaviours s during driving

- Less than two-thirds of the participants (61.7%) claimed that they either always or often using seat belt

while driving inside the city whereas 63% using it always or often in high ways.

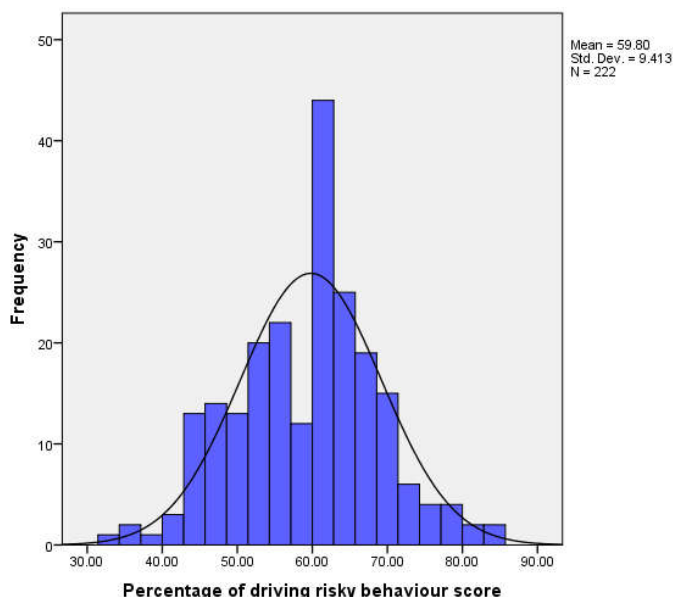
- More than one-quarter of the participants (29.8%) claimed that front passenger were always/often using seat belt while 10% reported that back seat passenger were always/often using seat belt.
- Less than half of the participants (46%) and 9% claimed that they always/often using seat belt when they were front or back seat passengers, respectively.
- Almost one third of workers (32%) were always/often using mobile phones by hands while driving.
- Only 8.1% of the participants exceeded the fixed speed always/often in residency or school areas,

22.5% always/often exceeded the fixed speed by no more than 25 km/hour while 14.5% of them always/often exceeded the fixed speed by more than 25 km/hour

- About one-fifth of the male workers (19.8%) always/often using the adult seat belt for children compared to 41.5% claimed that they always/often using the seat belt that specific for children.
- Only 8.1% of the participants were always/often putting children in their lap while driving and 24.8% were always/often putting children in front seats while driving. (Table 3)

**Table 3. Behaviours s of the participants during driving**

	Always N (%)	Often N (%)	Sometimes N (%)	Rarely N (%)	Never N (%)
Using seat belt while driving inside the city	88 (39.6)	49 (22.1)	59 (29.6)	18 (8.1)	8 (3.6)
Using seat belt while driving in high way	104 (46.8)	36 (16.2)	47 (21.2)	23 (10.4)	12 (5.4)
Front seat passenger use seat belt	39 (17.6)	27 (12.2)	75 (33.7)	50 (22.5)	31 (14.0)
Back seat passenger use seat belt	11 (5.0)	11 (5.0)	42 (18.9)	48 (20.7)	112 (50.4)
Using seat belt when you are a front seat passenger	59 (26.6)	43 (19.4)	56 (25.2)	38 (17.1)	26 (11.7)
Using seat belt when you are a backseat passenger	11 (5.0)	9 (4.0)	43 (19.4)	39 (17.5)	120 (54.1)
Using mobile phone by hands while driving	31 (14.0)	40 (18.0)	79 (35.5)	41 (18.5)	31 (14.0)
Exceed the fixed speed in residency or school areas	12 (5.4)	6 (2.7)	50 (22.5)	54 (24.3)	100 (45.1)
Exceed the fixed speed by no more than 25 km/hour	20 (9.0)	30 (13.5)	83 (37.4)	60 (27.0)	29 (13.1)
Exceed the fixed speed by more than 25 km/hour	21 (9.5)	11 (5.0)	66 (29.7)	62 (27.9)	62 (27.9)
For children under 12 years					
Using adult seat belt for children	24 (10.8)	20 (9.0)	58 (26.1)	37 (16.7)	83 (37.4)
Using seat belt specified for children	52 (23.4)	18 (8.1)	35 (15.8)	28 (12.6)	89 (40.1)
Putting your child in your lap while driving	10 (4.5)	8 (3.6)	38 (17.1)	36 (16.2)	130 (58.6)
Putting kids in front seats	23 (10.4)	32 (14.4)	67 (30.2)	37 (16.7)	63 (28.3)



**Figure 4. Distribution of percentage of diving risky behaviours score among Male workers, primary Health care centers, Jeddah**

Overall, the behaviours during driving score were normally distributed as evidenced by not significant p-value of Shapiro-Wilk test (0.448). It ranged between 32.86% and 84.29% with a mean±SD of 59.80±9.41% as illustrated in Figure 4.

## Factors associated with driving risky behaviours

### Demographic characteristics

As shown in Table 4, older male workers (>50 years) had higher percentage of risky driving behaviours score than those aged between 20 and 30 years (65.84±10.51 versus 58.57±9.35%). However, the difference didn't reach statistical significance level, p=0.070. The postgraduate male workers had the highest percentage of risky driving behaviours (70.39±7.23%) whereas university graduated group had the lowest one (58.10±9.17%), p=0.001. Male workers who reside outside Jeddah had higher driving risky behaviours percentage score compared to those reside in Jeddah (67.62% versus 59.58%), p=0.039. Non-smoker Male workers had higher percentage of risky behaviours score compared to smokers and ex-smokers (62.43%±8.94% versus 57.69±9.29 and 56.35±9.14, respectively), p<0.001. Marital status, job category and income of the participants were not significantly associated with risky driving behaviours.

**Table 4. Male workers' demographic characteristics associated with risky driving behaviours**

	Risky driving behaviours score		p-value*
	Mean	SD	
Age in years			
20-30	58.57	9.35	
31-40	59.13	9.29	
41-50	61.53	8.95	
>50	65.84	10.51	0.070*
Marital status			
Married	59.77	9.63	
Single	59.17	8.50	
Divorced	64.05	8.15	0.510*
Education			
Intermediate school/less	62.98	8.25	
High school	61.66	7.47	
University	58.10	9.17	
Diploma	59.24	9.92	
Postgraduate	70.39	7.23	0.001*
Residence			
Jeddah	59.58	9.39	
Outside Jeddah	67.62	8.11	0.039**
Job			
Nurse	59.79	9.45	
Administrative	60.14	9.37	
Lab technician	59.86	9.27	
Pharmacist	58.13	8.40	
General practitioner	60.26	8.13	
Dentist	57.78	10.83	
Others	62.52	13.04	0.790*
Income (SR/month)			
≤3000	62.32	8.80	
3001-5000	63.87	9.73	
5001-10000	58.52	9.84	
>10000	59.85	9.14	0.183*
Smoking history			
Yes	57.69	9.29	
No	62.43	8.94	
Ex-smoker	56.35	9.14	0.001*

\* ANOVA test\*\* Student's t-test

### Driving history

Male workers who had a history of death of a family member/relative because of RTAs had lower driving risky

behaviours percentage compared to those who had no such history (60.52±9.68% versus 57.69±8.60), p=0.041. Other driving history issues were not significantly associated with driving risky behaviours.

**Table 5. Association between driving history of male worker and their risky driving behaviours**

	Risky driving behaviours score		p-value
	Mean	SD	
Having a driving license			
Yes	59.61	9.45	
No	61.98	9.21	0.306**
Duration of car driving (years)			
≤10	61.43	9.08	
>10	59.33	9.60	0.213**
History of ever having RTAs			
Never	61.19	9.89	
Yes, once	60.48	10.21	
Yes, twice	58.81	9.35	
Yes, trice	59.79	8.32	
Yes, more than three times	57.09	7.18	0.366*
If yes, did that accident cause any physical injury			
Yes	61.53	10.67	
No	59.14	9.11	0.356**
History of hospital admission as a consequence of RTAs			
Yes	59.59	8.03	
No	63.47	13.17	0.518**
Death of a family member/relative because of RTAs			
Yes	57.69	8.60	
No	60.52	9.68	0.041**
Number of deaths in family/relative due to RTAs			
One	56.46	7.67	
Two	59.17	7.83	
Three	59.76	12.14	
>three	57.76	9.72	0.759*

\* ANOVA test\*\* Student's t-test

### Perception of risky driving behaviours

The most dangerous risky driving behaviours as perceived by male workers were putting the children on the driver's lap while driving (weighted mean on a scale ranged between 1 and 5 was 4.45), exceeding speed limits within residency/school zones (weighted mean=4.41), driving in a speed exceeding speed limit by more than 25 km (weighted mean=4.28), using cell phones with hands while driving (weighted mean=4.28), not using seat belt while driving in high ways (weighted mean=4.21) and putting the children on mother's lap while driving (weighted mean=4.17) (Table 6).

Overall, the perception of driving risky behaviours score was abnormally distributed as evidenced by significant p-value of Shapiro-Wilk test (<0.001). It ranged between 20% and 100% with a mean±SD of 79.42±16.78% as illustrated in figure 5.

## Factors associated with perception of driving risky behaviours

### Demographic characteristics

As shown in table 7, general practitioners had the highest percentage of perception of driving risky behaviours score (mean rank =148.02) whereas nurses had the lowest score percentage (mean rank was 94.13), p=0.019.

Table 6. Perception of the Male workers in primary Health care centers in Jeddah regarding driving risky behaviours

	Not dangerous at all				Very dangerous	Weighted mean
	1	2	3	4	5	
Using adult seat belt for children	66 (29.7)	17 (7.7)	45 (20.3)	39 (17.6)	55 (24.8)	3.0
Not using car seat for children while driving	25 (11.3)	10 (4.5)	31 (14.0)	33 (14.9)	123 (55.4)	3.99
Putting the children on the driver's lap while driving	13 (5.9)	4 (1.8)	19 (8.6)	21 (9.5)	165 (74.3)	4.45
Putting the children on mother's lap while driving	12 (5.4)	7 (3.2)	37 (16.7)	41 (18.5)	125 (56.3)	4.17
Putting children in front seats	13 (5.9)	7 (3.2)	40 (18.0)	48 (21.6)	114 (51.4)	4.09
Using cell phones with hands while driving	10 (4.5)	5 (2.3)	32 (14.4)	41 (18.5)	134 (60.4)	4.28
Front seat passengers not wearing seat belt	13 (5.9)	11 (5.0)	57 (25.7)	60 (27.0)	81 (36.5)	3.83
Back seat passengers not wearing seat belt	23 (10.4)	30 (13.5)	73 (32.9)	48 (21.6)	48 (21.6)	3.31
Not using seat belt while driving inside the city	16 (7.2)	19 (8.6)	56 (25.2)	53 (23.9)	78 (35.1)	3.71
Not using seat belt while driving in high ways	12 (5.4)	8 (3.6)	28 (12.6)	47 (21.2)	127 (57.2)	4.21
Exceeding speed limits within residency/ school zones	11 (5.0)	6 (2.7)	19 (8.6)	31 (14.0)	155 (69.8)	4.41
Driving in a speed not more than 25 km of speed limit	17 (7.7)	16 (7.2)	37 (16.7)	57 (25.7)	95 (42.8)	3.89
Driving in a speed exceeding speed limit by more than 25 km	11 (5.0)	9 (4.1)	23 (10.4)	42 (18.9)	137 (61.7)	4.28

Table 7. Male workers' demographic characteristics associated with perception of risky driving behaviours

	Perception of driving risky behaviours			p-value
	Median	IQR	Mean rank	
Age in years				
20-30	81.54	70.77-89.23	96.73	
31-40	84.62	74.62-92.31	110.04	
41-50	83.08	71.54-90.0	103.07	
>50	90.77	81.54-93.85	131.64	0.282**
Marital status				
Married	84.62	75.38-90.77	113.73	
Single	80.0	63.08-89.23	91.90	
Divorced	81.54	77.69-100	125.92	0.180**
Education				
Intermediate school/less	76.92	51.92-87.69	88.96	
Hugh school	80.0	67.69-100	106.35	
University	84.52	71.15-90.77	114.76	
Diploma	82.31	75.38-89.23	109.50	
Postgraduate	86.15	83.08-93.85	131.41	0.546**
Residence				
Jeddah	83.08	72.69-90.77	109.71	
Outside Jeddah	82.31	49.23-94.23	102.08	0.770*
Job				
Nurse	81.54	63.08-87.69	94.13	
Administrative	81.54	67.69-89.23	99.80	
Lab technician	83.85	80.38-92.31	122.75	
Pharmacist	83.08	72.31-91.15	108.92	
General practitioner	90.77	86.15-93.85	148.02	
Dentist	82.31	65.77-90.77	102.75	
Others	84.62	67.69-93.85	116.26	0.019**
Income (SR/month)				
≤3000	57.69	40.0-97.69	81.50	
3001-5000	81.54	41.54-84.62	81.91	
5001-10000	81.54	65.38-86.46	97.82	
>10000	84.63	78.46-90.77	119.40	0.017**
Smoking history				
Yes	84.62	74.23-92.31	118.44	
No	83.08	69.62-89.23	104.03	
Ex-smoker	85.38	62.69-92.31	116.08	0.263**

\* Mann-Whitney test\*\* Kruskal-Wallis test

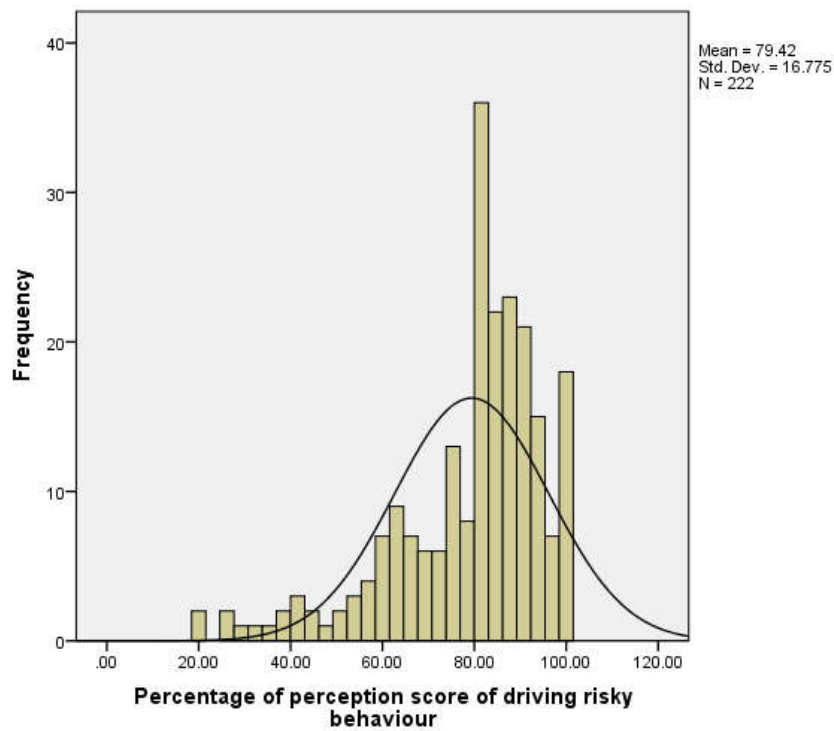


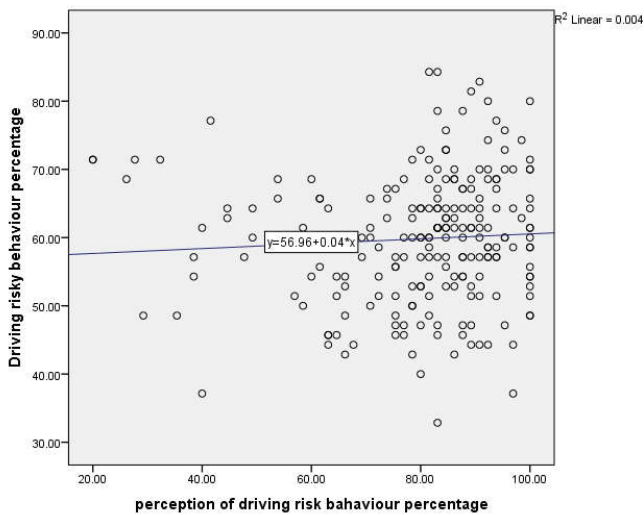
Figure 5. Distribution of percentage of diving risky behaviours score among Male workers, primary Health care centers, Jeddah

Table 8. Association between driving history of Male worker and their perception of driving risky behaviours

	Perception of driving risky behaviours			p-value
	Median	IQR	Mean rank	
Having a driving license				
Yes	83.08	73.85-90.77	110.94	
No	84.62	64.62-91.92	111.64	0.965**
Duration of car driving (years)				
≤10	81.54	63.08-90.77	96.91	
>10	83.85	75.38-90.77	110.46	0.218**
History of ever having RTAs				
Never				
Yes, once	84.62	75.38-92.31	115.70	
Yes, twice	81.54	64.46-90.77	105.03	
Yes, trice	83.08	74.23-89.23	111.91	
Yes, more than three times	83.08	66.15-92.31	114.57	
If yes, did that accident cause any physical injury	83.08	75.38-92.31	114.72	0.905**
Yes				
No	76.92	64.62-89.62	68.54	
History of hospital admission as a consequence of RTAs	93.08	73.08-90.77	85.42	0.211*
Yes				
No	75.38	66.15-90.77	7.5	
Death of a family member/relative because of RTAs	81.54	44.62-89.23	7.5	NA
Yes				
No	81.54	67.69-89.23	100.26	
Number of deaths in family/relative due to RTAs	84.62	75.38-92.31	113.43	0.177**
One				
Two				
Three	78.46	67.69-89.23	27.38	
>three	83.08	60.77-89.23	28.75	
	88.46	81.15-100	41.33	
	81.54	59.23-88.46	26.82	0.283**

\* Mann-Whitney test\*\* Kruskal-Wallis test

NP: Not applicable



**Figure 6. Correlation between risky driving behaviours and perception regarding them among Male workers, Primary Health care centers, Jeddah**

Participants whose income exceeded 10000 SR/month had the highest percentage of perception of driving risky behaviours score (mean rank =119.40.02) whereas those whose income was  $\leq 3000$  SR/month had the lowest score percentage (mean rank was 81.50),  $p=0.017$ . Age, marital status, education, residence and smoking history of the participants were not significantly associated with perception of risky driving behaviours.

#### Driving history

None of the studied variables of driving history of Male workers was significantly associated with perception of driving risky behaviours as illustrated in Table 8.

#### Correlation between risky driving behaviours and perception regarding them

There was borderline statistically significant correlation between risky driving behaviours and perception regarding them ( $r=0.131$ ,  $p=0.051$ ). Figure 6

## DISCUSSION

Over the past twenty years, 86,000 deaths and 611,000 injuries were reported in the Kingdom of Saudi Arabia as a result of in RTAs, with 7% resulting in permanent disabilities (Saudi Gazette, 2013). Nearly 30 % of accidents occurring in the KSA occur within the city limits (Hasan *et al.*, 2014). It is supposed that male workers especially health professionals play a role in counseling patients and people regarding avoiding risky driving behaviours. Therefore, it is important that male healthcare workers should not engage in risky behaviours themselves. Despite of these facts, little researches have been conducted to investigate the perception of risky driving behaviours in KSA, particularly among male healthcare workers. Therefore this study was implemented to measure the frequency, identify the common types and related factors of the risky driving behaviours among male working in primary health care centers in Jeddah, KSA. In this study, 8.1% of male workers had no driving license, 38.3% not always/often using seat belt while driving inside the city, 37% not always/often using seat belt while driving in high ways and 32% were always/often using

mobile phones by hands while driving. Quite similar results have been reported in studies carried out in Egypt (Sabbour and Ibrahim, 2010) and India (Kulkarni *et al.*, 2013) among medical students. In a study carried out among drivers in Al-Riyadh, Al-Ahsa and Ar-Deriyah, Saudi Arabia, 53.9% of the participants sometimes or always made/received phone calls and 38.5% read or sent text messages while driving (Osugwu *et al.*, 2013). Nearly three-quarters of the participants in this study had history of road traffic accidents; out of them 12.2% had more than 3 RTAs. In a study conducted in Abha among male students, more than 50 % had been involved in RTAs (Ym, 2006). In another study conducted among drivers from Dammam, Al-Khobar, Qateef, and Jubail, 52% of them had previous RTAs; 75% were seat belt compliant, and 60% used mobile phones while driving (Aba Hussein and El-Zobeir, 2007). These findings confirm the fact that RTAs is a major public health problem in the Kingdom of Saudi Arabia, that necessitate a prompt action on national basis. In the present study, in agreement with others (Mansuri *et al.*, 2015; Grey *et al.*, 1989), male workers aged 20-30 years were less likely to follow safety instructions during driving compared to older Male workers ( $>50$  years), although not significant. This was explained by Mansuri (2015) by the fact that in KSA, young people consider car driving as a source of entertainment for themselves. This finding also reflects the absence of formal training in driving, and lack of parental control. In addition, biomarkers of cortisol were observed to be associated with younger-driving risk (Ouimet *et al.*, 2014). Rhodes and Pivik reported that young drivers engaged in risky driving activities more frequently than adult drivers (Rhodes and Pivik, 2011). Studies from Iraq (Shabila *et al.*, 2015) and Brazil (Colicchio and Passos, 2010) revealed that medical students were engaged at high frequency in risky driving behaviours. The current study revealed that death of a family member/relative because of RTAs was significantly associated with better driving behaviours. This is could be attributed to the fact that having such bad experience alert people to follow safety instructions while driving, although having personal previous accident was not related to risky driving behaviours. This means that the influence of a death of a friend/relative is more impressive than having a personal accident. The finding that smokers were more likely to follow risky driving behaviours than non-smokers in this study coincides with others' finding (Oltedal and Rundmo, 2006) and could be explained by the fact that both smoking and unsafe driving are considered risky behaviours.

In the present study, the most dangerous risky driving behaviours as perceived by male workers were putting the children on the driver's lap while driving, exceeding speed limits within residency/school zones, driving in a speed exceeding speed limit by more than 25 km, using cell phones with hands while driving, not using seat belt while driving in high ways and putting the children on mother's lap while driving. In another study carried out in Saudi Arabia by Hasan *et al* in Jeddah (2014), (Hasan *et al.*, 2014) the most dangerous driving act, as rated by the drivers, was "drive thru red light" (62%), followed by "racing another driver" (53%). In that study, only 23% of the drivers thought that it was dangerous to drive over 30 km of the legal speed limits. Also, the same percentage (23%) of the drivers also thought that it was not dangerous to use mobile phone while driving. The least "extremely dangerous" driving action, as rated by the drivers, was driving over 20 km over the speed limit. The difference between our study and that one could be attributed mainly to



the nature of the participants. As expected, the perception of physicians regarding driving risky behaviours was significantly higher than perception of other male workers and also perception of high income workers regarding driving risky behaviours was significantly higher than their counterparts. The evidence sufficiently supports that the action plans in KSA so far have mostly focused on the prevention of road traffic injuries rather than RTAs, including seat belt laws, Safer system, emergency medical rescue services, and the role of the police in the documentation of RTAs. While the international recommendations emphasize on developing institutional framework, safer roads and vehicles, proper surveillance or data system, safer road users, and post-crash care (Saudi Gazette, 2013). The present study revealed a borderline significant relationship between driving risky behaviours and perception regarding them. Generally, people who are exposed to risky driving behaviours also perceive driving risks as low, and those perceiving risk as high are less likely to undertake the behaviours (Ginsburg *et al.*, 2008; Ryb *et al.*, 2006; Ulleberg and Rundmo, 2003). However in USA, it has been reported that risk perception was not a good predictor of reported seatbelt use (Calisir and Lehto, 2002).

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