

Attitudes towards Road Safety among Pre-drivers: The Case of Qatar

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Abstract

A preliminary study involving school students aged 12-18 years attempted to test whether there is difference in attitudes towards road safety between Arab and non-Arab respondents. The sampled participants were categorized according to age group, ethnicity and type of school they attend. Responses on their perceived driving ability, basic road safety knowledge and their willingness to participate in a common road safety campaign were analyzed. The results show that Arab students of pre-driving age tend to perceive that they have the skills to drive and showed poorer attitude towards road safety than non-Arab students. Older students of Arab origin and in public schools are more likely not to participate in road safety campaigns as compared to the younger age group of non-Arab origin and in private schools. Attitude change interventions that is appealing to pre-drivers of Arab origin studying in public school could be more effective strategy to raise the road safety awareness in par with the rest of the residents. Carefully designed contents for driving simulators that convey interactive road safety lessons and Variable Message Signs (VMS) can be considered and maximize effectiveness of road safety campaigns.

Keywords

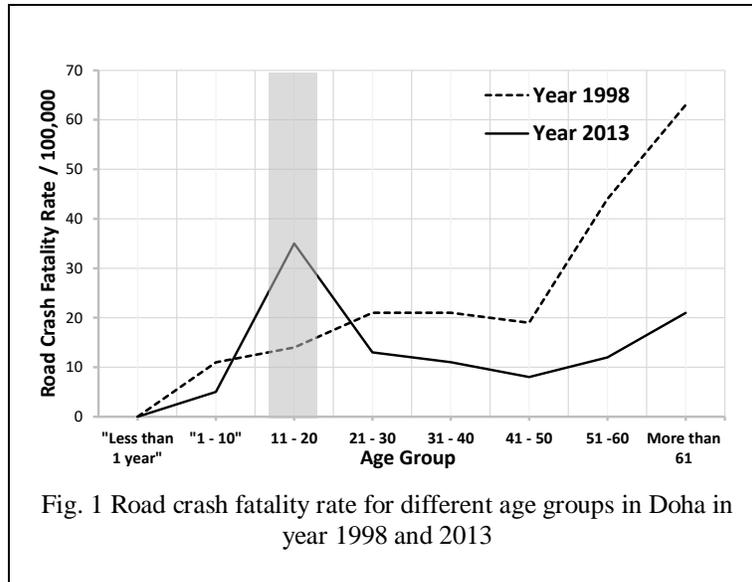
Students; road safety ambassadors, Arab, pre-drivers, attitudes

1. Introduction

Fatalities from road crashes are tragic events that cause enormous emotional grief and economic loss to societies. Globally about 1.25 million people lose their lives due to road traffic crashes and another 20-50 million suffer from injuries related to the crashes. According to WHO, road traffic injuries are the leading causes of preventable death among young people, aged 15-29 years (WHO 2015). Qatar is a growing country driven by diverse population. It is natural for global trends in road traffic crashes to also be manifested in Qatar. It is estimated that, in Qatar, one in eight deaths from all causes is due to road traffic injury in 2013 (Qatarliving.com 2013). Socio-economic status, age and sex have been listed as main risk factors of road traffic injury. Road users from lower socio-economic backgrounds are more likely to be involved in road traffic crashes, a little less than half of all road crash deaths are between 15-44 years and ¾ of all road traffic deaths happen on men (Consunji et al. 2014).

It comes to no surprise then that Qatar experiences high rate of road crash injuries and fatalities. In Qatar, the demographic factors are uniquely different from the rest of the world. Qatar is the richest country in the world with its citizens making up less than 15% of total number of residents. The majority of Qatar's residents are male-dominated labourers of specific nationalities earning low income. In between these two population groups are those from different parts of the world, living with their families and earning attractive incomes. These population groups make up Qatar's diverse multi-national society with distinct features. The influx of foreign nationals for work purposes and the prescriptive nature of the Qatari immigration law created the world's highest male ratio, with 2.87 males/females. The 15-44 age group make up 70% of the total population, whereas on average such age group make up only 49% of the Western Asian countries (Consunji et al 2014).

Historical road crash fatality data for Qatar shown in Figure 1 indicate increase of fatality rate per 100,000 in the 11-20 age group in 2013 as compared to year 1998. While the fatality rate in the other age groups per 100,000 seem to have decreased over the period, the rate for only the 11-20 age group appear to have increased. Moreover, Consunji et al 2014 in his study found that male Qatari aged 10-29 borne disproportionate mortality burden from road traffic crashes and have 5-10 times higher fatality rates compared to the general population.



A media report quoting the largest trauma center in Qatar, Hamad Hospital, highlighted the prevalence of under-age drivers on the road. The analysis from data sample of 443 trauma patients aged between 0-18 years showed that 40% of the victims were 15-18 years of which 42% were drivers at the time of the injury from road crashes. It also showed that fatality rate from road crashes increases in Qatari males between 10-19 years (JustHere 2014)

The realities above triggered the need to raise awareness of the risks that young people take on the road before they establish risky driving behaviours. A number of interventions have been implemented that primarily target drivers above 18 years old but few that are aimed at young road users below the legal driving age. Most are campaigns that advocate general road safety information such as use of seat belts and the importance of not exceeding speed limits. One of the most known campaign that targets pre-driving age is the "Students for Road Safety" initiative for 12-18 years students. Its main objective is to increase the awareness of five road safety knowledge areas: seatbelts, use of mobile phones while driving, appropriate following distance, speeding and traffic signal law. It is not easy to evaluate such types of campaigns that are not based on any theoretical model. They generally do not have specific target audience which is especially critical in a diverse population for effective impact.

This study focus on understanding the prevalent attitudes towards road safety among 12-18 years male students in Qatar. It seeks to bring to light the difference between demographic groups and their attitudes towards road safety. This understanding is expected to assist in future strategies /plans /interventions that aims at reducing the carnage on the roads.

2. Methodology

A questionnaire was designed to measure students' knowledge of road safety behaviours and their inclination to be part of road safety campaigns. Responses given to surveys could be affected by what is regarded as desirable due to social or peer pressure prevalent in the age group targeted. Moreover, surveys tend to explore behavior or attitude that is not necessarily followed through in practice. Another limitation of the study is that it only targeted male students who are disproportionately represented in road traffic crashes in Qatar (Deighton & Luther 2007).

The survey was targeted at students between the age of 12 and 18 years in both preparatory and secondary schools as well as independent public and private international schools to cover as much of the demographics as possible.

Independent public schools are overwhelmingly attended by Qataris and the rest are from other Arab countries. In total 1,300 survey forms were distributed to 13 schools of which 711 were filled and returned. The school administrators distributed the surveys randomly to the students and gave them time to complete. The surveys were distributed either as hard copy or soft copy (online version) depending on the schools' preferences. The survey questions were general in nature appropriate for the educational level of the students and focused on road safety factors targeted by most awareness campaigns. The completed questionnaires were from a wide range of groups that represented Qatar student population between the ages of 12 and 18 years.

The students data received was checked and cleaned for any missing information. A descriptive analysis based on age group, ethnicity and school type was done and the results are shown in Table I.

Description	Frequency	Percent
Age Group		
12-15	200	28.1
16-18	511	71.9
Total	711	100
Ethnicity		
Arab	486	68.4
Other	225	31.6
Total	711	100
School type		
Public	314	55.8
Private	397	44.2
Total	711	100

To test whether there is any significant difference in the self-reported perception of driving ability and readiness for driving license, two yes/no questions were included in the questionnaire.

Furthermore, to understand the attitudes of the students towards road safety elements, five questions regarding general road safety knowledge were asked. Responses were scored on a 5-point Likert scale ranging from 1: strongly disagree to 5: strongly agree.

The students' willingness to participate in road safety campaigns, was verified by their desire to be road safety ambassadors under different reward system. Responses were chosen from "not interested", "interested if rewarded", "interested to volunteer" and "can't decide".

3. Data Analysis

The study used parametric analyses for ease of interpretation of results. While this may be debatable, there is strong literature that supports use of such statistical tools on relatively large sample data (above 100) without having to meet the normality test. (Binder 1984; Lumley et al. 2002; Zumbo and Zimmerman 1993)

3.1 Perception of driving ability and readiness for driving license

686 students grouped by age (11-15, 16-18), ethnicity (Arab, Other) and the type of school they attend (private, public) were asked if they think they can drive and whether they are ready for a driver's license. The chi-square test of homogeneity was used in the analysis. Summary of the test is shown in Table II. In general, the majority in each subgroups (with the exception of the non-Arab students group) consider themselves able and ready to drive a car. Significant higher proportion in the perception of driving ability in the older age group is found as expected. Most importantly, Table II point to high statistically significant difference in the proportion of Arab (75%) and non-Arab (47%) students in their perceived ability to drive and readiness for license. Similar results are obtained from public schools (78%) and private schools (57%).

3.2 Attitudes towards road safety elements

Attitudes towards road safety elements were assessed by averaging the response to five questions covering speed, seatbelt, following distance, mobile use and traffic signal violations. Each item was scored on 5-point Likert scale with low score indicating higher attitude towards road safety awareness.

TABLE II STATISTICS ON THE PERCEPTION OF DRIVING ABILITY AND READINESS FOR DRIVING LICENSE

Parameter	Driving Ability		Significance (p)	License Readiness		Significance (p)	
	Yes	No		Yes	No		
Age Group	11-15	55%	45%	0.005	51%	49%	0.001
	16-18	71%	29%		65%	36%	
Ethnicity	Arab	75%	25%	0.005	70%	30%	0.005
	Other	47%	53%		41%	59%	
School Type	Public	78%	22%	0.005	70%	30%	0.005
	Private	57%	43%		53%	47%	

As shown in Table III, there is significant difference in the means in all three parameters (age group, ethnicity and school type). However, the highest difference in mean was shown when analyzed by ethnicity. Arabs, on average, tend to have less road safety awareness (2.273+0.76) than those from other ethnicity (1.966+0.57), a statistically significant difference of 0.31 (95%CI, 0.2055 to 0.4066), $t(567) = 5.98$, $p=0.005$. Similarly students of public schools showed significantly lower road safety awareness (2.239+0.77) compared to private schools, a statistically significant difference of 0.12 (95% confidence level), $t(617) = 2.1$, $p=0.036$. This clearly confirms that students of Arab origins have significantly lower road safety awareness as compared to those from other ethnicity.

TABLE III STATISTICS ON THE ATTITUDES TOWARDS ROAD SAFETY ELEMENTS

Parameter	N	Mean	Std. Deviation	t	df	Sig.	Mean Difference	95% CI		
								Lower	Upper	
Age Group	12-15	198	2.28	0.64316	2.6	409	0.010	0.146	0.0355	0.2566
	16-18	507	2.134	0.7376						
Ethnicity	Arab	480	2.273	0.75529	5.98	567	0.005	0.30602	0.2055	0.4066
	Other	225	1.966	0.56781						
School type	Public	312	2.239	0.76923	2.1	617	0.036	0.11526	0.0073	0.2232
	Private	393	2.124	0.66525						

3.3 Willingness to participate in road safety campaigns

Table IV shows the results of the analysis. Little less than half of all the students are undecided or not interested in participating in any road safety campaigns. Older students (15-18 years), of Arab origin and in public schools are more likely not to participate in road safety campaigns as compared to the younger age group, of non-Arab origin and in private schools.

TABLE IV CAMPAIGN PARTICIPATION ANALYSIS

Parameters		Ambassador				Sig (p)
		No Interested	Reward	Volunteer	Undecided	
Age Group	12-15	18%	22%	36%	24%	0.005
	16-18	24%	19%	33%	24%	
Ethnicity	Arab	24%	17%	37%	22%	0.005
	Other	19%	25%	28%	29%	
School Type	Private	18%	20%	33%	29%	0.005
	Public	28%	19%	36%	17%	

The other half of the students are interested in participating in road safety campaigns only if rewarded or as volunteers. Volunteering for road safety campaigns tends to appeal to Arab students (37%) than others (28%).

3. Discussion and Conclusion

In general, Arab students in public schools of Qatar show higher perception of driving ability coupled with lower attitudes towards basic road safety elements. The product of such combination underestimates the risks involved in driving and could be the reason for the prevalence of under-age driving on the roads of Qatar.

This paper can be considered a preliminary research on male students of pre-driving age and highlights the dire need for attitude change intervention. Road safety education program is commonly employed on pre-driving age students with the intention to inform the development of their attitudes and beliefs related to driving. However there is lack of evaluation of such programs making it difficult to assess their effectiveness.

Tailoring road safety education program based on what appeals to the target audience would be beneficial. This research work found that it would be more effective to target Arab students in primarily public schools. Active participation, and use of personal experiences are more likely to be successful if included in road safety education program. Despite the lack of evidence that support use of ITS to deliver road safety message in pre-driving age, interactive and creative tools that is engaging may be worthwhile. One of the techniques to increase road safety awareness is the usage of driving simulators to convey interactive road safety lessons and Variable Message Signs (VMS), which are electronic boards placed along arterials and highways, to deliver awareness messages as well as traffic information. These messages should consider the characteristics of the targeted audience to maximize effectiveness and compliance.

Acknowledgements

Authors thank the administrators and students of the schools for their participated in the study and Maersk Oil for their sponsorship of the project.

References

- Global status report on road safety 2015. Geneva, World Health Organization, 2015 (http://www.who.int/violence_injury_prevention/road_safety_status/2015/en/).
- R. J. Consunji, R. R. Peralta, H. Al-Thani, and R. Latifi, "The implications of the relative risk for road mortality on road safety programmes in Qatar," *Injury prevention*, pp. injuryprev-2013-040939, 2014.
- Qatarliving.com (December 2013, December 2017). One in Every Eight Deaths Happen on the Road. Available:<http://www.qatarliving.com/life-qatar/posts/one-every-eight-deaths-happen-road>
- JustHere. (March 18, 2014, March 15, 2017). 80% of children dying on Qatar's roads are teens; just over 1% used seatbelts. Available: <http://www.justhere.qa/2014/03/eighty-percent-children-dying-qatars-roads-teens-just-1-used-seatbelts/>
- C. Deighton and R. Luther, "Pre-driver education-a critical review of the literature on attitude change and development, good practice in pre-driver education and programme effectiveness," *Road Safety Research Report*, 2007.
- A. Binder, "Restrictions on statistics imposed by method of measurement: Some reality, much mythology," *Journal of Criminal Justice*, vol. 12, pp. 467-481, 1984.
- T. Lumley, P. Diehr, S. Emerson, and L. Chen, "The importance of the normality assumption in large public health data sets," *Annual review of public health*, vol. 23, pp. 151-169, 2002.
- B. D. Zumbo and D. W. Zimmerman, "Is the selection of statistical methods governed by level of measurement?," *Canadian Psychology/Psychologie Canadienne*, vol. 34, p. 390, 1993.

Biographies

Semira Mohammed is a senior researcher for Qatar Transportation and Traffic Safety Studies Center (QTTSC) of Qatar University in the area of Traffic and Transportation Engineering. Prior to joining the center, she held a similar post in the Transport Systems and Operations Research Group at the Council for Scientific and Industrial Research (CSIR) in Pretoria, South Africa. She holds a degree in Civil Engineering from the University of Asmara, Eritrea and Masters in Transportation Planning from the University of Pretoria, South Africa. Her research work focuses in the areas of transport planning, transport modelling and traffic engineering.

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