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ORIGINAL ARTICLE

Seat-belt use and associated factors among drivers and front passengers in the metropolitan city of Peshawar, Pakistan: A cross sectional study.

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ABSTRACT

INTRODUCTION: Road traffic accidents is a major public health problem with an estimate to become the ninth leading cause of death worldwide. Pakistan yearly spends around 100 billion rupees on injuries and ranks 5th due to the fatality associated with road traffic accidents. Seat-belt use decreases the fatality amongst drivers and front-seat passengers by around 45–50%. Therefore, the current study was aimed to determine seat belt use among drivers and front passengers and its association of demographic factors.

MATERIAL AND METHODS: A cross-sectional study was carried out from October 2016 to March 2017. The city was categorized into five major geographical areas and from each of these areas two roads were randomly selected from the list of the available roads. Data collection was done in the petrol pumps located on these roads and every fifth vehicle interviewed. Data was collected on an adapted tool with information regarding use of seat-belt and socio-demographic factors. Data was analyzed, using STATA version 13.1.

RESULTS: A total of 1690 vehicles were interviewed during the time period. Around one third (35.5%) of the drivers were using seat-belt when approached and none of the front passengers. Around three fourth (72.2%) of the drivers reported avoiding fines and penalties as the main reason for using seat-belts. The main reason reported for not wearing seat-belt was embarrassment and was reported by around half of the drivers (45.6%) and front passenger (42.8%). On logistic regression education, type of vehicle and years of experience were independently associated with seat-belt use. Driving experience and education were negatively associated with seat-belt use while the use was less in private cars compared to taxis.

CONCLUSIONS: Seat belt use in drivers of the metropolitan city of Peshawar was quite low and ironically was none in the front passengers. Avoiding fines and penalties was the main reason for seat-belt use which was common in taxis. Policy makers and planners should impose regulations and implementation of seat-belt use by all passengers to reduce the morbidity and mortality following road traffic accidents.

KEY WORDS: Seat-belt use, drivers, front passengers, road traffic accidents, morbidity, mortality.

INTRODUCTION

Road Traffic Accidents (RTAs) and associated injuries, is a major public health problem in the world and so in Pakistan [1]. RTAs are estimated as the ninth leading cause of death worldwide and is believed to be the seventh leading cause of deaths by 2030 [2]. The rise in these numbers is mainly due to the emerging economic status of the low and middle income countries leading to urbanization and motorization [3].

World Health Organization (WHO) reported that 1.25 million or more people died due to traffic accidents globally in 2013 [4].These deaths could have been prevented, as seat belts are around 50% successful in preventing fatalities in accidents [5]. RTAs puts an enormous burden on the economy of a country and individual families. In middle and low income countries it often affects age groups which are economically productive and have a role in the society [6,7]. For each individual killed in an RTA there are at least 20 others with non-fatal injuries [8]. A study done by Junaid A Razzaq in five trauma centers of Karachi (Pakistan) on RTA patients, out of pocket healthcare cost was found to be 271 US$ per patient. The same study also estimated worth of work time lost by a wounded person and his attendant to be 67 US$ [9]. In financial terms roughly 100 billion rupees is spent on injuries from RTAs yearly in Pakistan [10].

Regarding worldwide deaths due to RTA, Pakistan ranks 5th in number [11]. The use of seat belts in four wheeled vehicles could prevent a significant number of deaths and severe injuries [12]. Using seat-belt decreases the threat of fatality amongst drivers and front-seat passengers by 45–50% and hazard of small and severe injuries by 20% and 45% respectively. In rear seat passengers seat belt decreases fatal and serious injuries by 25% and minor injuries by up to 75% [13]. Article 7 of Vienna convention (1968) best suits for the above figures which says that "*in motor vehicles the seat belt should be used by both driver and passengers*" [14]. Ankara, the capital of Turkey, in a study reported just 16% of vehicle drivers and 18% of front-seat travelers used seat belt on city roads; although, on intercity roads, the use rate was much higher at around 71% among drivers [15]. According to first national survey in Pakistan, seat belt usage was 20%, Out of which the greater percentage (53%) was on motorways and the least (5%) was on roads of rural localities [16].

Some important factors associated with the use of seat-belts are; assurance of properly functioning seat-belts fitted in the vehicles, laws mandating its use, implementation of laws, education and awareness campaigns, especially for young age groups and rendering seat-belts a social norm [17]. Though some or all of the mentioned factors have been addressed in the industrialized countries [18], there is scarcity of local research in Khyber Pakhtunkhwa, the north western part of Pakistan. The current study will provide us the local perspective of a global problem and help us in recommending measures for prevention of road traffic injuries in Pakistan. Therefore, the current study was aimed to determine seat belt use among drivers and front passengers and associated socio-demographic factors with use and non-use of seatbelts.

MATERIAL AND METHODS

Peshawar is a metropolitan city and capital of the province of Khyber Pakhtunkhwa, Pakistan. The city is densely populated with more than 4 million populations in the recently concluded census of Pakistan with a fairly equal urban and rural divide [17]. The current cross sectional study was carried out from October 2016 to March 2017. The city was categorized into five major geographical areas (Charsadda road, Hayatabad, Cantonment area, GT road and Inner city area) and from each of these areas two roads were randomly selected from the list of the available roads. Data collection was done in the randomly selected petrol pumps located on these roads and every fifth vehicle was invited for participation.

Sample size was calculated on the basis of 20%[16] prevalence of seat belt use from a previous study with 95% confidence level, 2% margin of error and adding a 10% non-response, the final sample size was 1690. Data was collected on an adapted tool [26] with information regarding use of seat-belt and socio-demographic factors. Data was entered, clean and analyzed, using STATA version 13.1. Association between seat belt use and other socio-demographic factors like age, education, marital status, occupation, type of vehicle, year of driving, driving licensing and source of driving licensing was done through chi square tests. Logistic regression was used to determine the association between seat belt use after adjustment for potential confounders on variables through a priori criteria of $p<0.20$ on uni-variate analysis. Informed consent was taken from each participant after explaining the purpose of the research study. The study received ethical clearance from the Khyber Medical University ethics board.

RESULTS

A total of 1690 vehicles were interviewed during the time period. All of the drivers interviewed were male. Around one third (33.3%) of them were illiterate and a quarter (25.2%) had secondary level of education. More than one third (39.5%) of the drivers were having salaried job and around three fourth (73.1%) were married. Out of the 588 front passengers more than four fifth (83.5%) were male. Around one fourth of the front passengers were of 18-25 years of age. For detail information see Table 1.

Driving related characteristics

A total of 1690 vehicles were included in the study. Out of these, around half (43.3%) were taxis. Almost all of them were having driving license (98.5%) in which 94.3% agreed to show license. Most of them (86.7%) have learned driving from friend and relatives (Table 2).

Prevalence of seat-belt use

Around one third (35.5%) of the drivers were using seat-belt when approached and none of the front passengers. The prevalence was more in Taxis and Hiace and was less in Private Cars and Carry Vans as reported in Figure 1.

Reasons for use and non-use of seat belt

Figure 2 below shows the reasons for use and non-use of seat belts by the drivers. As can be seen around three fourth of the drivers who were using seat belt stated that avoiding fines and penalties is the main reason for using seat belts. On the other hand those drivers not using seat belts, around half of them expressed embarrassment as the sole reason for not using seat belts. The other least common reasons for use and non-use can be seen in the Figure 2.

Association of seat belt use with socio-demographic & driving related characteristics

Table 3 summarizes associations of socio-demographic and driving related characteristics of drivers with seat-belt use. Education, type of vehicle, years of driving and driving license validity were significantly associated with seat belt use. Age of the driver, marital status, occupation and source of learning driving skills were not associated with seat belt use.

Table 1. Socio-demographic characteristics of drivers and front passengers

DRIVERS		
Age	**Frequency [n]**	**Percentage [%]**
18-25	246	14.6
26-35	561	33.2
36-45	563	33.3
>45	320	18.9
Education		
Illiterate	557	33.0
Primary	342	20.2
Secondary	425	25.2
Post-secondary	239	14.2
Post Graduate	127	7.5
Occupation		
Salaried Job	667	39.5
Self Employed	417	24.7
Student	83	4.9
Unemployed/Retired/House makers	186	11.0
Daily Wages	337	19.9
Marital status		
Married	1235	73.1
Unmarried	430	25.4
Separated	25	1.5
FRONT PASSENGERS		
Age		
< 18	34	5.8
18-25	156	26.5
26-35	181	30.8
36-45	137	23.3
>45	80	13.6
Gender		
Male	491	83.5
Female	97	16.5
Education		
Illiterate	136	23.1
Primary	21	3.6
Secondary	71	12.0
Post-Secondary	211	35.9
Occupation		
Salaried Job	160	27.2
Self Employed	39	6.6
Student	145	24.6
Unemployed/Retired/House makers	174	29.6
Daily Wages	70	11.9
Marital status		
Married	373	63.4
Unmarried	215	36.6

Table 2. Driving related characteristics of drivers

Type of Vehicle	Frequency [n]	Percentage [%]
Taxi	731	43.3
Private car	517	30.6
Carry van	231	13.7
Hilux	211	12.5
Years of driving		
< 5	149	8.8
5-10	786	46.5
11-15	502	29.7
> 15	253	15.0
Driving License		
Yes	1665	98.5
No	25	1.5
Agree to show license		
Yes	1594	94.3
No	71	4.2
NA (those who don't have a license)	25	1.5
Validity of license		
Yes	1359	80.4
No	235	13.9
NA (no license & not willing to show)	96	5.7
Source of learning driving skills		
Friends and Relatives	1465	86.7
Driving School	225	13.3

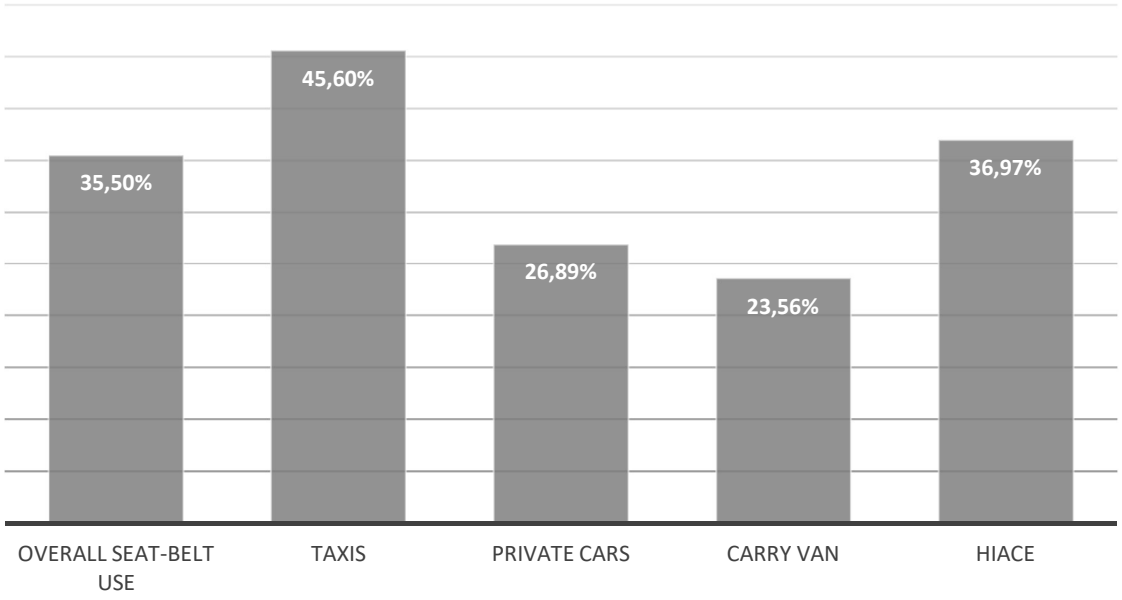

Figure 1. Prevalence of seat-belt use

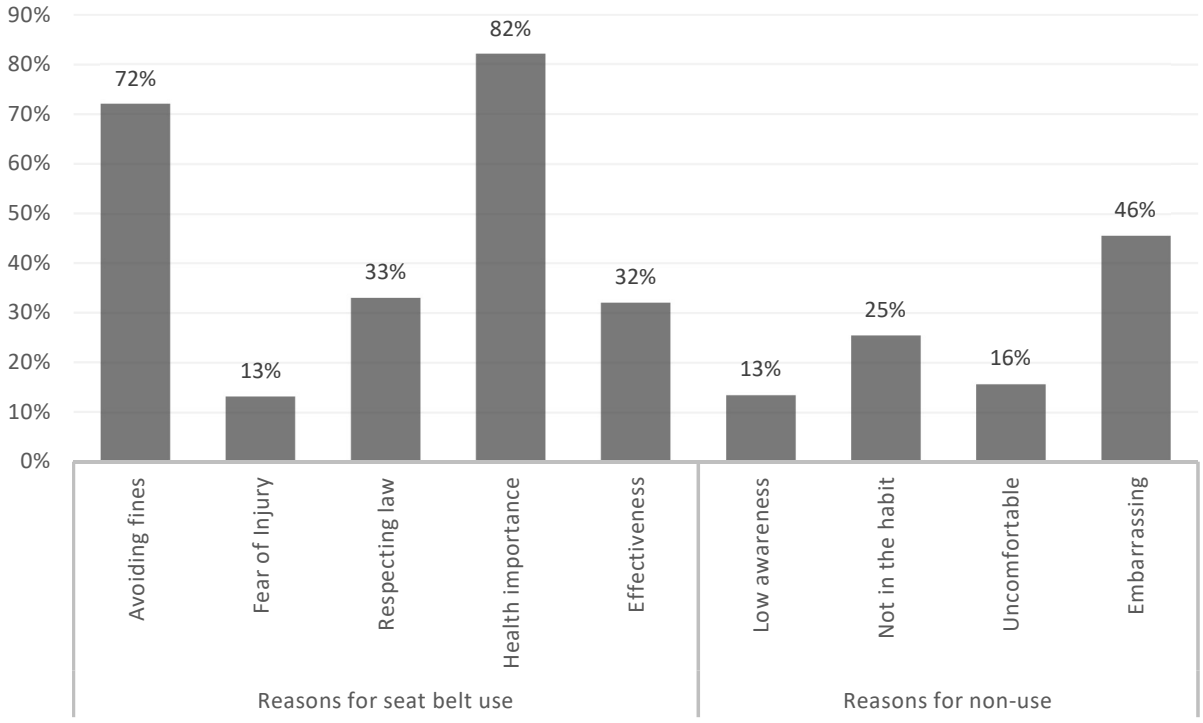

Figure 2. Reasons for use and non-use of seat-belt

Table 3. Socio-demographic characteristics and its association with seat belt use

Characteristics	Seat belt user N = 600 n (%)	Seat belt non user N = 1090 n (%)	Significance
Age of drivers			
18-25	94 (15.7)	152 (13.9)	
26-35	210 (35.0)	351 (32.2)	0.26
36-45	195 (32.5)	368 (33.8)	
>45	101 (16.8)	219 (20.1)	
Education			
Illiterate	227 (37.8)	330 (30.3)	
Primary	108 (18.0)	234 (21.5)	<0.001
Secondary	163 (27.2)	262 (24.0)	
Post-Secondary	75 (12.5)	164 (15.0)	
Post Graduate	27 (4.5)	100 (9.2)	
Marital Status of Drivers			
Never Married	157 (26.2)	273 (25.0)	
Married	430 (71.7)	805 (73.9)	0.18
Separated	13 (2.2)	12 (1.1)	
Occupation of driver			
Salaried Job	236 (39.3)	431 (39.5)	
Self employed	154 (25.7)	263 (24.1)	0.18
Student	34 (5.7)	49 (4.5)	
Unemployed/Retired/Keeping House	52 (8.7)	134 (12.3)	
Daily Wages	124 (20.7)	213 (19.5)	
Type of Vehicles			
taxi	334 (55.7)	397 (36.4)	
Private	139 (23.2)	378 (34.7)	<0.001
Carry Van	49 (8.2)	182 (16.7)	
Hilux	78 (13.0)	133 (12.2)	
Years of driving			
< 5	61 (10.2)	88 (8.1)	
5-10	279 (46.5)	507 (46.5)	0.04
11-15	188 (31.3)	314 (28.8)	
>15	72 (12.0)	181 (16.6)	
Source of learning driving skills:			
Friend/Relative	518 (86.3)	947 (86.9)	0.75
Driving School	82 (13.7)	143 (13.1)	
Validity of License:			
Yes	468 (84.5)	891 (85.9)	0.05
No	86 (15.5)	146 (14.1)	

Table 4. Univariate and Multivariate logistic regression of Seat Belt use and its associated Factors (significantly associated variable are highlighted)

Variables	Categories	Uni-variate		Multivariate	
		Unadjusted Odds ratio (95% CI)	P-value	Adjusted Odds ratio (95% CI)	P Value
Education	Illiterate	1		1	
	Primary	0.67 (0.50,0.90)	< 0.01	0.64 (0.48,0.86)	< 0.01
	Secondary	0.90 (0.70,1.17)	0.45	0.86 (0.66,1.13)	0.30
	Post secondary	0.70 (0.50,0.92)	0.01	0.70 (0.50,1.00)	0.05
	Post Graduate	0.40 (0.25,0.62)	< 0.001	0.47 (0.27,0.81)	< 0.01
Drivers occupation	Salaried Job	1		1	
	Self employed	1.07 (0.83,1.38)	0.60	1.13 (0.86,1.50)	0.38
	Student	1.27 (0.80,2.02)	0.32	2.06 (1.13,3.77)	0.02
	Unemployed/ Retired/House Makers	0.71 (0.50,1.01)	0.06	1.15 (0.74,1.80)	0.53
	Daily Wages	1.06 (0.81,1.40)	0.66	0.97 (0.73,1.30)	0.84
Marital Status	Married	1		1	
	Unmarried	1.10 (0.86,1.35)	0.53	1.01 (0.76,1.34)	0.94
	Separated	2.03 (0.92,4.50)	0.08	2.98 (1.30,6.90)	0.01
Type of vehicle	Taxi	1		1	
	Private Car	0.44 (0.34,0.56)	< 0.001	0.46 (0.34,0.60)	< 0.001
	Carry Van	0.32 (0.23,0.45)	< 0.001	0.29 (0.20,0.42)	<0.001
	Hilux	0.70 (0.51,0.96)	0.02	0.64 (0.46,0.90)	< 0.01
Driving experience	< 5 years	1		1	
	5-10 years	0.80 (0.55,1.13)	0.21	0.86 (0.56,1.32)	0.50
	10-15 years	0.90 (0.60,1.25)	0.44	0.85 (0.54,1.36)	0.51
	> 15 years	0.60 (0.37,0.88)	0.01	0.46 (0.26,0.82)	< 0.01
Valid driving License		0.60 (0.40,0.91)	0.02	0.31(0.76,1.31)	0.11

Univariate & Multivariate Analysis

In univariate analysis education, type of vehicle, driving experience and driving license validity were negatively associated with seat-belt use. Drivers with primary, post-secondary and post graduate level of education were significantly less likely to wear seatbelts compared to illiterate. Similarly, drivers of Private Cars, Carry Van and Hiace were significantly less likely to wear seatbelt compared to Taxi Drivers. Lastly drivers with more than 15 years of driving experience and a valid driving license were significantly less likely to wear seatbelts. Following univariate logistic regression, multivariate logistic regression analysis was done to examine the effects of socio-demographic and driving related variables with seat belt use and to adjust for the potential confounders. After adjustment of the potential confounders; education, type of vehicle and driving experience remained significant as were in univariate analysis. However, students compared to salaried job and drivers with separation compared to married were significantly more likely to wear seat belts although were not significant on univariate analysis (Table 4).

DISCUSSION

In the current study we determined the use of seat belt among drivers and front passengers in the metropolitan city of Peshawar and additionally factors associated with use and non-use of seatbelt among drivers. The main finding was that around one third of the drivers were using seat-belt when observed by the data collectors and none of the front passengers. The most common reason for use and non-use was to avoid fines/penalties and embarrassment respectively. On multivariate analysis, education i.e. primary, post-secondary and post graduate level of education, type of vehicle i.e. drivers of Private Cars, Carry Van and Hiace and drivers with more than 15 years of driving experience were significantly less likely to wear seatbelt compared to illiterate drivers, taxis and drivers with less than five years of experience respectively. While student drivers and those separated were significantly more likely to wear seat belt compared to drivers with salaried job and married marital status respectively.

The percentage of drivers who wore seat belts in the current study was 35.5%, this showed that overall two out of five drivers wore seat belt. A study done in Karachi by Junaid A Razzaq measuring the effect of a campaign regarding seat belt and helmet use also showed similar results. On average, 35.8% of drivers wore

seat belts in Nov 2009 and 39.8% wore seat belts in Apr 2010; a 4.0% increase in five-month duration.In the current study only drivers were using seat belt while no one was wearing seat belt among front passengers. However in the same study in Karachi one out of five front seat occupants wore seat belts [19]. This may be due to risk perception of driver as its seat location carries a much higher risk compared to the front seat passengers. The other possible reason could be that the time spent by the drivers in a vehicle is always more than the front seat passengers (especially in case of taxi drivers) and a person for a shorter time in a vehicle (passengers) may find it uncomfortable or think it is not necessary to wear the seat belt for a short time. One other explanation could be that the fine is on the driver and not on the front passenger in Pakistan.

Our results were also consistent with a Nigerian study where only one third of drivers wore seat belt, and car drivers were more likely to wear them than those driving heavy vehicles [20]. However a study in Iran showed that 77.9% of drivers were using a seatbelt [21]. similarly in a study done in Malaysia, 76.6% of drivers were observed to be using seat belt while 56% of the front passengers were wearing seat belt [22]. In Turkey a study done by Safak Bilgic et al, 50.24% of drivers were wearing seat belt while 34.79% of front seat passengers were wearing seat belt [23]. Another study in Thailand showed that 71.6% of drivers were using seat belt[24].Among different reasons better law enforcement may be a more pertinent reason for higher rates of seat belt use in these countries, as compared to Pakistan.

Gender based distribution of drivers and front seat passengers in this study was almost similar to another study conducted in Karachi.Moreover in our study, drivers aged 26-35 were more likely to wear seat belt than other age groups as seen in another study where 18-35 years were more likely to wear seat belts [19]. Another aspect studied was the effect of education level attained which has long been accepted as one of the contributing factors for fulfillment of traffic rules. In a study done in Malaysia finding shows where by as education level increases, the compliance level of seat belt use also increases [22]. However our study shows that as the level of education increases the use of seat belt decreases. This is a contrasting finding compared to the literature. One possible explanation could be that the prevalence was more in taxis and vehicles of public transport as they are more bound to be checked and asked by the administrations and majority of these drivers were illiterate.

Our results showed a trend for the use of seat belt in which taxi drivers were up the rank followed by private cars and then carry van drivers. Similar trend was observed in a study done in Iran but with almost double frequencies in each group [21]. Avoiding fine and penalties, was the main reason of wearing seat belt among users as seen in a study conducted in Iran [25,26]. The same Iranian study reported "*not being in the habit of wearing a seat belt*" as the most common reason for non-users of seat belt while in our case "*embarrassment*" was the main reason for not wearing seat-belt.

CONCLUSIONS

Seat belt use in drivers of Peshawar city is quite low and completely absent in front passengers. Embarrassment was the main reason for not wearing seat-belt followed by lack of comfort and restriction of movements but almost all the participants were aware of regulations. Alternatively, among the seat belt users, fear of fine and penalties was the main and out of proportion reason for use of belt while a trivial number of drivers were using seat belt due to its effectiveness. Awareness of people regarding regulations can be capitalized for more holistic approach of advocacy to improve the use of seat belt. The aforementioned can be achieved by involving different fields especially the law enforcement agencies, designing special messages (embarrassment & effectiveness of belt) and its propagation through mass media.

Disclosure statement

The authors did not report any potential conflict of interest.

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