

STUDY ON SEAT BELT USAGE: CASE STUDY OF ABU DHABI EMIRATE, UAE

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ABSTRACT

Based on World Health Organization (WHO) annual report 2015 wearing a seat-belt reduces the risk of a fatality among drivers and passengers by 25–50%. This report stated that just over half of all countries have enacted good seat-belt and child restraint laws.

United Arab Emirates (UAE) has a unique driver composition community, where more than two hundred different nationalities are residing in the country along with different education levels, culture, language, and driving skills which creates a considerable challenge for road safety concerned agencies. In Abu Dhabi (AD), the capital of UAE, there is a lack of better understanding regarding the frequency of using seat belt while driving and its impacts on drivers' and passengers' safety.

The main objective of this study is to identify the status of seat belt usage in Abu Dhabi depending on a statistical analysis and an assessment.

Results indicated that 39% of vehicles occupant's fatalities were not use seat belt in Abu Dhabi between 2010 and 2016. At the same period (Nonuse seat belt while driving) violations increased by 91%. About 31% of questionnaire participants claimed that they do not wear a seat belt while driving permanently, and it is striking that 45% of them feel uncomfortable driving when using it. This paper will present detailed data collection and analysis efforts. Also it highlights main findings. Finally the study will provide many recommendations that can be used to improve traffic safety.

KEY WORDS: Seat Belt Usage, Abu Dhabi, UAE

INTRODUCTION

Throughout the ages, vehicles are equipped with various safety devices to reduce occupant's severity in traffic crashes. The effectiveness of wearing seat belts is widely known to reduce injury severity and fatality to vehicle occupants in crashes, and its usage effectiveness has also been revealed in many studies(1). Based on World Health Organization (WHO) annual report 2015 wearing a seat-belt reduces the risk of a fatality among drivers and front-seat occupants by 45–50%, also among rear seat occupant's seat-belts reduce fatal and serious injuries by 25%. This report stated that just over half of world countries have enacted good seat-belt laws, and that covers 4.8 billion people only(2).

According to a national study conducted by the Faculty of Medicine and Science at the UAE University in 2008, on average only 29% of drivers wore seat belts, probably because there are many who still think it is “uncool” to wear it. In the same study, 98% of children travelling in a car were not restrained and 23% of children travelled in the front seat, which is actually illegal in the UAE for children below the age of 10(3). Another survey study conducted at the UAE in 2014 and participated by young male and female between 18 and 23 years old indicated that only one-third of the participants always wear seat-belt. While 44% of the young’s had a traffic accident, 72% reported that they rarely wear seat belts or do not wear them at all(4).

For each 3 fatal in Emirate of Abu Dhabi, 2 of them related to traffic crashes(5). Occupant’s seat belt usage is one of the main human factors that have significant contribution in crash severity. Moreover, in 2015, the statistics showed a significantly increment for (non use of seat belt while driving) violations between 2010 and 2014 by about 68.7%, where that violation represented about 21% of the total hazardous violations.

The most important thing we should take it into account that the UAE has a unique composition community, where more than two hundred different nationalities are residing in the country along with different education levels, culture, language, and driving skills which creates a considerable challenge for road safety concerned agencies. In AD, there is a lack of better understanding regarding the frequency of using seat belt while driving and its impacts on drivers’ and passengers’ safety.

The main objective of this study is to identify the status of seat belt usage in the Emirate of Abu Dhabi depending on an assessment questionnaire that has been designed and distributed among different nationalities as well as different ages and educational levels. In addition, traffic police crash reports insert the seat belt usage and crash casualties seat location that will be utilized in the analysis process.

Finally we should mention that a tangible effort has recently been done in AD to improve the road safety through the three main strategic approaches: Engineering, Education and Enforcement. Accordingly, road crash fatalities have reduced from 376 in year 2010 to 289 in year 2016 (about 23% reductions).

LETREATURE REVIEW

Most of the world faces the problem of increasing traffic crashes that kill many people. The non-usage of seat-belts is associated with many road traffic fatalities. This phenomenon caused loss of a large number of society members, especially young people, in addition to the occurrence of many wounded and disabled. The crisis became serious due to lack of educational campaigns related to non-usage of seat-belts, and lack of effective enforcement.

Despite its extreme importance, the non-use of seat belts goes beyond mere human suffering. Government’s budgets bear heavy burdens due to increased fatalities and treatment of traffic crash’s injuries, as well as support families of victims.

A study in Norway concluded that drivers and front seat passengers who do not use seat-belts suffer almost the same percentage of head injuries as non-users in rear seats(6). The American College of Emergency Physicians adopts the option of using seat-belts as the best protection against ejection in a crash(7). In 2006 National Highway Traffic Safety Administration (NHTSA) reported that 44% of unrestrained American passenger vehicle occupants killed are ejected, partially or totally, from the vehicle, as compared to only 5% of restrained occupants(8).

Regards to the effectiveness of seatbelts and child restraints in preventing fatalities and reducing injuries, most studies conducted throughout the world have shown conclusively that seat-belts save lives, when worn and fitted correctly. A review of research on the effectiveness of seat-belts found that their use reduces the probability of being killed by 40–50% for drivers and front seat passengers and by about 25% for passengers in rear seats(9, 10). In 2005 NHTSA reported to Congress that seat-belts are approximately 50% effective in preventing fatalities in USA traffic crashes. It is estimated that if all passenger vehicle occupants over 4 years of age in the United States had used seat-belts in 2004, nearly 21,000 lives could have been saved(11). Broughton J. (2003) found that an unrestrained rear seat passenger poses a serious threat to any restrained person seated directly ahead of them(12). One more findings illustrated that children who sit in the rear without child restraints have around 25% lower risk of being injured than children who sit in the front without restraints(9).

Rates of seat-belt use vary greatly between countries, governed to a large extent by the type of laws that require seat-belts to be fitted in vehicles, and the laws requiring them to be worn. Rates are also dependent on the degree to which these laws are enforced. In many low-income countries there is a weak law for belts usage, and rates of use are therefore correspondingly low. In addition, on all countries there may be cultural norms that negatively influence seat-belt wearing rates, particularly among young adult vehicle occupants. In many countries the use of child restraints is common – with usage rates up to 90%(13) – but in other countries they are still rarely used. Generally, compared with older drivers, young drivers and front-seat passengers are less likely than older drivers and passengers to use seat-belts while in a moving vehicle(14). Also, based on known restraint use, when the drivers were unrestrained, 70% of the children were also unrestrained(15).

During the last decade, hundreds of studies and researches conducted by surveys and questioners to investigate the status of seat-belt usage and its usage effectiveness in preventing death and reducing injury. Kamal et al. (2015) conducted a survey on seat belt utilization to understand which human factors have a significant effect among the educated young drivers. The findings showed that seat belt utilization much higher in the industrial countries and the utilization rate different because of culture differences. Also 45% of educated driver who admitted they always using the seat belt were on group aged from 18 to 35 years old(16).

Bhat et al. (2015) conducted a survey on seat belt use among rear seat passenger. The main findings illustrated that using the rear seat belt much high in the state which has rear seat belt enforcement law(17). Reagan et al. (2013) studied the driver's behavior regarding the seat belt use. Road side observation & self-report questionnaire were the two methods used to measure the behavior. The outcomes indicated that the young female drivers are infrequent user than female over 40 years. Also, the results showed that speed , trips per day and road type affect the driver's decision to wear the seat-belt(18).

In 2013, department of public safety's highway safety office in Utah state has carried out a study for the seat-belt using observational surveys . The findings indicated that the usage rates of the seatbelt for Van occupant, female and urban residents were high. On the other hand that rate was low for the truck occupants, male and rural residents(19). Demirer et al. (2012), investigated by survey how the seat belt usage affected by the level of education. The findings indicated that if the education level increases the seat-belt usage increased. Additionally, he concluded many factors limit the seat belt usage as the short distance driving, discomfort belt and lack of habit(20).

Simsekoglu & Iajunen (2009), conducted a survey to collect a data regarding the relation between the seat-belt use and the driver behavior. The results suggested that the driver & front seat passenger on outside city roads were more likely to use the seat-belt compared to whom driving on city roads. But, for the back seat passengers no different behavior in two situations and they tend to not wearing the seat belt(21). In 2009, Okabas et al. studied through survey the reasons that push the drivers to not use the seat-belt. The results indicated that 67.5% of driver did not feel comfortable when use the seat-belt. Also, the results showed that 45.8% did not use the seat belt because no one else was used it(22). Gras et al. (2007) on his attempt to find the reasons the Spanish driver do not wear the seat belt by a questionnaires, indicated a reverse relationship between the rate of seat belt using and driver experience(23).

DATA COLLECTION AND PREPARATION

Two types of data were employed in this study: crash data and self-reported questionnaire survey. About 11,373 related severe crashes that occurred during the last seven years (2010 - 2016) in AD were extracted and used in the analysis. The database of AD traffic police includes detail information about characteristics of at-fault-drivers, vehicles, road and environmental. In addition, the severities of traffic crashes are classified into four levels; fatal, severe injury, medium injury and slight injury. Also the database includes details regarding casualties' seat-belt usage and their seat location.

On the other hand, investigation for the rate of using seat belt was collected from a self-reported questionnaire that was carried about among random sample of drivers in AD. The questionnaire form was designed into five main parts to cover information regarding drivers' demographic characteristics, driving behavior, seat-belt usage while driving, drivers' awareness about the importance of using seat-belt while driving, and finally their personal opinions. The questionnaire forms were randomly handed out among licensed drivers in AD in different public areas (such as shopping malls, governmental authorities, etc.). The questionnaire includes 39 questions. About 1,500 questionnaire forms were distributed, however, a total of 1,104 complete and reliable forms were received and used in the analysis of this study.

ANALYSIS AND RESULTS

Frequency of occupants fatalities cross years

A total of 14,351 cases of vehicular crashes and 24,264 of its casualties were considered for analysis. The information about the status of seat-belt usage (used/non used) been collected through traffic police reports. Table 1 shows the frequency of fatalities' seat-belt usage status by the occupants. The statistical analysis of the categorical data indicates that 75.7% of crashes' fatalities were occupants.

TABLE 1 Fatalities' indicators severe crashes, Abu Dhabi, 2010-2016

Indicator	2010	2011	2012	2013	2014	2015	2016
Number of Severe Crashes (i.e. crashes with at least one injury or fatality)	2537	2283	2056	2071	1861	1803	1740
Number of Fatalities	376	334	271	289	267	245	289
Occupants' Fatalities	272	251	198	237	202	188	217
Fatalities who not fasten Seat Belts	94	102	112	100	72	57	66

Figure 1 shows the numbers of crashes and occupants' fatalities during the last seven years. It shows an increase trend of occupants' fatalities especially during the last 2 years. It also points 39% of the occupants' fatalities did not fasten seat-belts. Overall statistical analysis indicated that 7,567 occupants did not use seatbelts (out of the total of 20,813 injured occupants), representing almost about 36% of the studied cases.

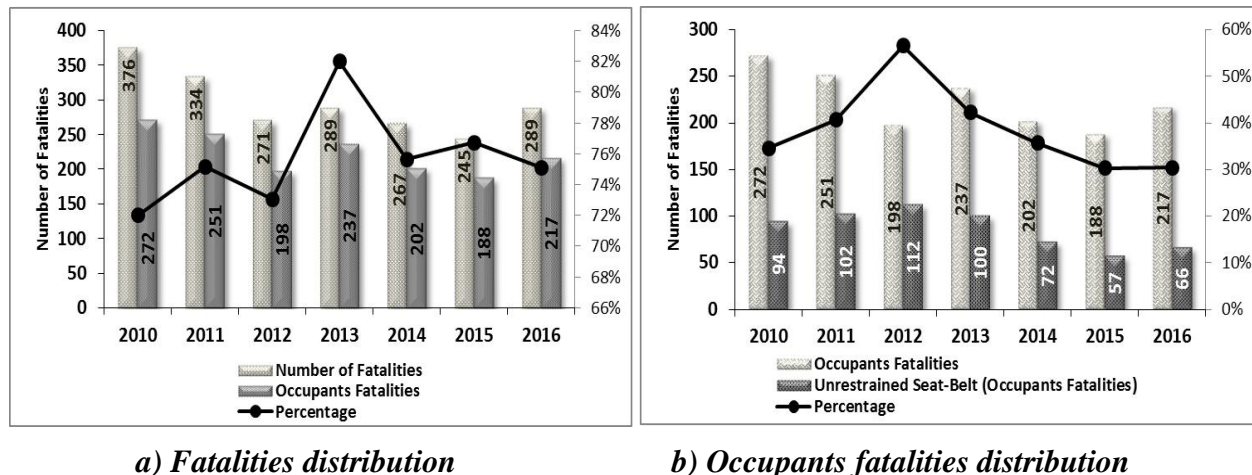


FIGURE 1 Distribution of the fatalities over last seven years

The statistical analysis of data also indicates that there is a significant relationship between unrestrained occupants' fatalities and their seat location. 58% of occupants' fatalities whose not fasten seat-belt were drivers and 23% of them were rear seat passengers.

Characteristics of occupants' fatalities who not fasten seat-belt

The distribution of occupants' fatalities location for seat-belt usage during study period shows that 39% of drivers' fatalities and 39% of passengers' fatalities did not use seat-belt. In addition, it indicates that rear seat passengers are the least committed to fasten seat belt.

Table 3 shows the characteristic of occupants' fatalities whose not fasten seat-belt. The table shows that the majority (about 86%) of fatalities whose not fasten seat-belt were male. This result is expected as about 85% of the licensed drivers in AD are males. In addition, it was observed that most of female fatalities whose not fasten seat-belt were rear seat passengers which clearly mean that female setting on rear seats are less committed to fastening the seat belt.

Moreover, the most age of those fatalities was on age category (18-24) years old, which seems that young drivers and passengers gain more confidence at this age and they tend to commit main mistake by not using seat-belt.

In addition, table 2 shows a serious phenomenon: 39% of fatalities whose not fasten seat-belt on age category (0-4) were set on front seat. Also, over 40% of parents sit their infant in their mothers' sit in the front passenger seat, which puts them at high risk of death.

The data reveals that the fatalities whose not fasten seat-belt increase between drivers and front seat passengers with increasing the speed limit of roads, but for those sit on rear seats its highest rate were on the 60 Km/hr roads where rear-end crashes mostly occur.

TABLE 2 The characteristics of fatalities (not fasten seat-belt) who involved in severe crashes in Abu Dhabi during 2010-2016

Variable	Categories	Driver Seat		Front Seat		Rear Seat		Total
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Gender	Male	325	92.3%	93	80.9%	98	72.1%	516
	Female	27	7.7%	22	19.1%	38	27.9%	87
Age	Under 18 years	10	2.8%	16	13.9%	27	19.9%	53
	18-24	93	26.4%	32	27.8%	23	16.9%	148
	25-30	71	20.2%	25	21.7%	26	19.1%	122
	31-40	83	23.6%	21	18.3%	31	22.8%	135
	41-50	53	15.1%	9	7.8%	19	14.0%	81
	51-60	28	8.0%	6	5.2%	5	3.7%	39
	Over 60	14	4.0%	4	3.5%	4	2.9%	22
	Unknown	0	0.0%	2	1.7%	1	0.7%	3
Under 18 years	0 - 4 Years	0	0.0%	7	43.8%	11	40.7%	18
	5 to 9 Years	0	0.0%	0	0.0%	7	25.9%	7
	10 to 17 Years	10	100.0%	9	56.3%	9	33.3%	28
Road Speed	Below 40 Km/hr	9	2.6%	2	1.7%	0	0.0%	11
	40 Km/hr	30	8.5%	3	2.6%	7	5.1%	40
	60 Km/hr	81	23.0%	26	22.6%	45	33.1%	152
	80 Km/hr	74	21.0%	15	13.0%	25	18.4%	114
	100 Km/hr	88	25.0%	37	32.2%	33	24.3%	158
	120 Km/hr	70	19.9%	32	27.8%	26	19.1%	128

Relationship between occupants' fatalities whose not fasten seat-belt and crash types / causes

Table 3 illustrates the percentage of the types of traffic crashes in Abu Dhabi Emirate during (2010-2016) resulted in deaths between occupants whose not fasten seat-belt. It shows that Deterioration, Sideswipe Collisions, and Rear-End Collisions were the major Crash Types that caused deaths for occupants whose not fasten seat-belts (26%, 20%, and 17% respectively). It also indicates that the major crash type that caused deaths for unrestrained driver and front seat passengers was deterioration crashes (28% and 32%). For unrestrained rear-seats passengers was a sideswipe collision. Moreover it's been observed that rear-end collisions (by 20%) are major crash types that caused deaths for rear-seats passengers whose not fasten seat-belts.

TABLE 3 Main crash types distribution (2010-2016)

Unrestrained Seat-Belt (Fatalities)						
Crash Type	Driver Seat		Front Seat		Rear Seats	
	No.	%	No.	%	No.	%
Deterioration	97	28%	37	32%	24	18%
Sideswipe Collision	67	19%	23	20%	32	24%
Collision Fixed Object out of Road	31	9%	8	7%	6	4%
Rear-End Collision	58	16%	16	14%	27	20%
Perpendicular Collision	34	10%	7	6%	9	7%
Total Of Other Crash Types	65	19%	24	21%	38	28%

As presented in Table 4, speeding is the major Crash Cause that caused deaths for occupants whose not fasten seat-belts (drivers 37%, front seat passengers 39%, and rear seats passengers 30% respectively). It also indicates that tailgating collisions (by 18%) are major crash cause that caused deaths for passengers whose not fasten seat-belts.

TABLE 4 Main crash causes distribution (2010-2016)

Unrestrained Seat-Belt (Fatalities)						
Crash Causes	Driver Seat		Front Seat		Rear Seats	
	No.	%	No.	%	No.	%
Speeding	130	37%	45	39%	41	30%
Sudden Swerve	51	14%	18	16%	10	7%
Lane Discipline	46	13%	11	10%	17	13%
Tailgating	20	6%	6	5%	25	18%
Entering a Road without Ensuring it is Clear	25	7%	8	7%	5	4%
Total Of Other Crash Types	32	16%	20	18%	31	24%

The statistical analysis of the categorical data indicates that there is a significant relationship between the drivers' fatalities (whose not fasten seat-belt) and lane discipline, Entering a Road without Ensuring it is Clear, and Reckless Driving crash causes. Moreover there is a significant relationship between the rear seats passengers' fatalities whose not fasten seat-belts and tailgating, and red light crossing crash causes.

Questionnaire analysis and results

In this important part, data and information for the study were collected through questionnaire. A questionnaire was designed and implemented for drivers on the use of seatbelts while driving. It included 39 questions about the reasons why a seatbelt could not be used, the importance of using a seat-belt while driving, etc. The questionnaire distributed in different regions of AD and included the following topics: Personal information, Information on driving behaviors, Information about seat-belt usage, the importance of seat-belt usage, and opinions.

As indicated earlier, a total of 1,104 responses were used in the analysis of this study. The characteristics and most important responses of the questionnaire's participants are summarized in Table 5. Due to space constraints of the paper, it was not possible to present participants' responses to every question of the survey. However, all questions related to the objectives of this study were presented and discussed in details.

TABLE 5 Participants' responses to survey questions

Variables	Categories	frequency	Percent
Demographic Information			
Gender	Male	257	23
	Female	847	77
Age	< 18	6	1
	18 - 25	116	10
	26 - 35	515	46
	36 - 45	265	24
	46 - 60	162	15
	> 60	40	4
Nationality	U.A.E.	328	30
	G.C.C.	39	3

Variables	Categories	frequency	Percent
	Arabs	319	29
	Asian	355	32
	Others	63	6
Education	High school degree or less	439	40
	University degree or higher	665	60
Information Regarding Driving Behavior			
Q11: Have you been involved in traffic crash during the last 3 years?	Yes	742	67
	No	362	33
Q17: Was the injured occupant using seat belt during the crash?	Yes	753	68
	No	351	32
Information About Seat Belt Usage			
Q18: Do you use seat belt while driving?	Always	766	69
	Often	124	11
	Sometimes	120	11
	Rarely	58	5
	Never	36	3
Q21: Have you ever received a traffic violation due to not using seat belt?	Yes	277	25
	No	827	75
Q27: Do you make sure that your child wears a seat belt?	Yes	406	73
	No	150	27
Importance of Using a Seat Belt While Driving			
Q28: Do you know that using seat belt reduces the risk of death by 50%?	Yes	977	88
	No	127	12
Q30: Do you know that 3 out of 4 traffic crashes occurs in a distance of 40km from home, so it's so important to wear seat belt even if driving for short distances?	Yes	786	71
	No	318	29
Q34: Do you know that the probability of getting injured in the spine due to traffic crash is 14 times higher in case of not using seat belt?	Yes	744	67
	No	360	33
Q35: Did you receive any awareness (through campaigns) regarding the importance of using seat belt while driving?	Yes	730	66
	No	374	34
Opinions			
Q39: In your opinion, which drivers are more committed with wearing seat belt while driving?	Passenger cars drivers	256	23
	Taxi drivers	553	50
	School bus drivers	147	13
	Labor bus's drivers	83	8

31% of respondents do not always wear a seat belt while driving. It is remarkable that 45% of those who do not always wear their seatbelts while driving feel uncomfortable driving when use it. 7% of those who do not always wear seatbelts while driving are due their lack of use seat-belt to the absence of traffic enforcement and non-strict fines.

It is strange that 3% of those who do not always wear seatbelts feel that their use is dangerous for lives and 4% are not convinced about seatbelts importance and its role in saving lives. As mentioned above, there is a significant lack of awareness and education about the importance of using seatbelts while driving, which raising further questions about what students have received from theoretical training curriculum during their training at Emirates Driving Company E.D.C. (E.D.C. is a governmental company provides services of road safety education, driving training for all vehicles, basic vehicle knowledge, traffic laws, and introduces participants to the cognitive skills required to drive safely)

75% of the participants reported that increasing strict traffic enforcement and awareness campaigns play a key role for encouraging and forcing them to fasten seat-belt while driving. 49% of those who have been violated because they did not fasten seat-belt while driving have received only one offense during the last 3 years, while 19% of them received two or three.

60% of participants who have children under age of 10 years do not use the child restraints while their children presence with them inside vehicle. This is a frightening proportion, which is alarming and warning of a great danger surrounds children while traveling on parents' vehicles, and increase the likelihood of serious injuries and fatalities during traffic crashes.

More than a quarter of participants who have children under age of 10 years are not keen to use their children to the seatbelts while they are in the car. This is a high and dangerous proportion that requires increment and enhancement traffic enforcement; tighten laws and fines related to passengers usage for seatbelts, and finally implement new law force all occupants to use seatbelts and force parents to use child restraints if they are with them in a vehicle.

Although 89% of the participants reported their well knowing about that not fasten a seat-belt increasing the risk of serious injuries during traffic crashes, more than 25% of them do not fasten a seatbelt while driving. It is interesting to note that only 73% were aware about importance of using a seatbelt while driving for reduce the likelihood of fatality or serious injury during traffic crashes while 27% acknowledged that they had not been sensitized about that. It is strange that 26% of those who reported that they had been sensitized (before obtaining a driving license) about seatbelt importance for reducing the risk of injury during traffic crashes, do not fasten seatbelts permanently while driving.

DISCUSSION

One way to enhance roadway safety is to improve drivers' behaviors' and increase their compliance with traffic laws. It is well-established that (not fasten a seat-belt while driving) is one of the critical and most frequent aberrant driving behaviors that negatively affect the safety of whole vehicles' occupants. So improving drivers' compliance with seat-belt usage can play a crucial role in improving traffic safety.

So, the primary objective of this study was to thoroughly examine the trends of seat-belt usage, occupants' tendency towards fasten seat-belt, drivers' and passengers' behavior to fasten seat-belt while driving, and vehicle occupants' awareness and recognition of the negative effect of not fasten a seat-belt while driving. Another main objective was to identify and quantify the

characteristics of occupants' fatalities whose not fasten seat-belt and relationship between them and crash types/causes.

The analysis of traffic crashes in AD showed that 75.7% of crashes' fatalities were occupants. It also showed an increase trend of occupants' fatalities especially during the last 2 years by 15%. It was found also that 39% of the occupants' fatalities did not fasten seatbelts. One interesting result was that there is a significant relationship between occupants' fatalities whose not fasten seat-belt and seat location. In addition, it's been indicated that rear seat passengers (especially female) are the least committed to fasten seat belt.

Moreover, it seems that young drivers and passengers (between 18-24 years old) gain more confidence at this age and tend to non use a seat-belt. These findings prove the necessary of conducting educational campaigns at universities, colleges and high schools where young at this age found. A serious phenomenon been observed, that 39% of fatalities (whose not fasten seat-belt) who are on age category (0-4) were set on front seat, this indicated that around 40% of parents sit their infant in their mothers' sit in the front passenger seat, which puts them at high risk of death. The outcomes revealed that the fatalities whose not fasten seat-belt increase between drivers and front seat passengers with increasing the speed limit of roads, but for those sit on rear seats its highest rate were on the 60 Km/hr. roads where rear-end crashes mostly occur.

The results also indicated that Deterioration, Sideswipe Collisions, and Rear-End Collisions were the major Crash Types that caused deaths for occupants who not fasten seat-belts. Additionally, speeding is the major Crashes' Cause that caused deaths for occupants who not fasten seat-belts. All these figures confirm the problem of seat-belts' non usage and shed lights on the importance of improving future plans and strategies that aim to diminish that problem.

Additionally, a self-reported questionnaire survey was conducted among a random sample of drivers in AD to gain some insights about driver's responses to seat-belts' non usage and importance of using a seat-belt while driving. The survey findings indicated that 45% of those who do not always wear their seatbelts while driving feel uncomfortable driving when use it and 7% of them due their lack of use seat belt to the absence of traffic enforcement and non-strict fines. One alarming result was that 60% of participants who have children under the age of 10 years do not use the child restraints while their children presence with them inside vehicle.

Based on the above results, it is clear that there is a significant lack of awareness and education about the importance of using seatbelts and child restraints while driving, which raising further questions about what students have received (Before obtaining a driver's license) from theoretical training curriculum during their training at Emirates Driving Company E.D.C.

Considering the results of questionnaire, police departments are recommended to increase their physical presence on roads due to the strong association of their presence and achieving higher compliance with seat-belt usage by drivers. Furthermore, all relevant agencies should work on the sustainability of providing programs, training courses, and awareness campaigns for society members. In addition family role and all civilian segments should be activated to support the efforts of Abu Dhabi Traffic and Patrols Directorate for student's traffic awareness and teaching those principles of traffic safety rules to reach for well traffic educated generation.

Finally, we should greatly thanks the legal legislators for the recent legal amendments issued at the beginning of 2017 which oblige the drivers to provide child restraints from the age of 4 years

or less, commensurate with their weights and lengths, and add new offenses according to the following Table 6:

TABLE 6 Schedule of new violations and penalties, in accordance with ministerial regulation No. 178 of year 2017 on traffic rules and procedures

Violation No.	Violation	Fine (AED)	Demerit Points
49	A child of age 10 years or below, or who is less than 145 cm height sitting in the front seat of the vehicle.	400	-
50	Do not provide child restraints for children age of 4 years or less while they are in the vehicle.	400	-
51	A. Do not fasten seat-belt while driving (Drivers).	400	4
	B. Do not fasten seat-belt while driving (Passengers).		-

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REFERENCES

1. Shimamura M., Yamazaki M., and Fujita G. Method to evaluate the effect of safety belt use by rear seat passengers on the injury severity of front seat occupants. *Accident Analysis and Prevention*, No. 37, 2005, pp. 5–17.
2. World Health Organization. *GLOBAL STATUS REPORT ON ROAD SAFETY 2015*. ISBN 978 92 4 156506 6 (NLM classification: WA 275), <http://www.who.int>.
3. <http://www.drivearabia.com/news/2010/03/26/child-car-safety-seat-usage-in-detail/>. Accessed June 5, 2017.
4. <http://www.roadsafetyuae.com>. Accessed June 5, 2017.
5. <http://www.haad.ae/haad/tabid/58/Mid/417/ItemID/86/ctl/Details/Default.aspx>. Accessed June 5, 2017.
6. World Health Organization. *eat-belts and child restraints: a road safety manual*. 2009. <http://www.who.int/roadsafety/projects/manuals/seatbelt/en/>. Accessed June 5, 2017.
7. *Seat-belts*. Texas, United States, American College of Emergency Physicians (ACEP). 2002. (<http://www.acep.org/patients.aspx?LinkIdentifier=id&id=26106&fid=1348&Mo=No&acepTitle=Seat%20Belt%20Fact%20Sheet>). Accessed June 5, 2017.
8. The critical need for active ongoing seat-belt use programs in rural areas. National Highway Traffic Safety Administration. 2006. (<http://www.nhtsa.dot.gov/people/injury/airbags/RuralCrashes/pages/CriticalNeed.htm>). Accessed June 5, 2017).
9. Elvik R, Vaa T, eds. *The handbook of road safety measures*. Elsevier, 2004.
10. Evans L. Safety belt effectiveness: the influence of crash severity and selective recruitment. *Accident Analysis and Prevention*, No. 28, 1996, pp.423–433.

11. The national initiative for increasing safety belt use: Buckle Up America campaign. Eighth Report to Congress. National Highway Traffic Safety Administration, 2005 (<http://www.nhtsa.dot.gov/people/injury/airbags/8thBUARReport/index.htm>). Accessed June 5, 2017.
12. Broughton J. The threat posed by unrestrained rear seat car passengers. TRL Report 563. Crowthorne, United Kingdom, TRL Ltd, 2003.
13. NHTSA's National Center for Statistics and Analysis, TRAFFIC SAFETY FACTS-Seat Belt Use in 2016-Overall Results, DOT HS 812 351, <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812351>. Accessed June 5, 2017.
14. NHTSA's National Center for Statistics and Analysis, TRAFFIC SAFETY FACTS-2014 Data- Children, DOT HS 812 271, [file:///C:/Users/net/Downloads/2014%20Traffic%20Safety%20Factsheet%20CHILDREN%20\(1\).pdf](file:///C:/Users/net/Downloads/2014%20Traffic%20Safety%20Factsheet%20CHILDREN%20(1).pdf), Accessed June 5, 2017.
15. Road safety performance Index Flash 4: increasing seat-belt use. European Transport Safety Council, 2007 (<http://www.etsc.be/documents/PIN%20Flash%204.pdf>). Accessed June 5, 2017.
16. Kamal,W., Masuri, M., Dahlan,A., and Isa,K. Seat belt compliance and quality of life among educated young adults in an urban university. *Procedia-social and behavioral science*, No. 202, 2015, pp. 442-447.
17. Bhat,G. , Beck,L. , Bergen, G., and Kresnow,M. Predictors of rear seat belt use among U.S adults. *Journal of Safety Research*, No. 53, 2015, pp.103-106.
18. Reagan,I. , McClafferty,J. , Berlin,S. , and Hankey J. Using naturalistic driving data to identify variables associated with infrequent, occasional, and consistent seat belt use. *Accident Analysis and Prevention*, No. 50, 2013, pp. 600-607.
19. Utah department of public safety's highway safety office, 2013, Seat belt use survey.
20. Demirer, A. , Durat,M. , and hasimoglu, C. , Investigation of seat belt among the drivers of different education levels. *Safety Science*, No. 50, 2012, pp. 1005-1008.
21. Simsekoglu,O. , and Lajunen,T. Relationship of seat belt use to health and driver behavior. *Transportation Research, Part F* 12, 2009, pp. 235-241.
22. Akbas,O. , Guven,R. , Cebeci,G. , Bertlek,S. , Aldemir,G. ,and Bal,E. A study on the effects of seat belt posters on drivers. *Procedia social and behavioral sciences*, No. 2, 2010, pp. 1002-1007.
23. Gras,M. ,Cunill,M. , Sullman,M. ,Planes,M. ,and Mayolas,S. Predictors of seat belt use amongst Spanish driver. *Transportation Research, part F* 10, 2007, pp. 263-269.