Research Article

# Young drivers and crashes involvements: frequency and severity

## Abstract

Young drivers are considering as most risky in driving compared to other age groups of drivers. Understanding the contributing factors affecting traffic crashes caused by young drivers leads to more effective actions for improving road safety. This paper aims to examine the contributing factor affecting the occurrence of young drivers' crashes. Crash data from 2010 to 2015 has been collected from Abu Dhabi Traffic Police database. At-fault drivers aged between 18 to 24 years is defined as the young drivers in the analysis process. Descriptive statistics show that 23% of severe crashes are caused by young drivers. These crashes resulted 26% of the total fatalities of traffic crashes. Logistic regression model was developed to identify and quantify the variables that affect the occurrence of crashes related to young drivers. The model findings indicated that speeding, sudden lane changing and tailgating are the most caused of young drivers' crashes. Young drivers are probably to be involved in multi-vehicle crashes and pedestrian-related crashes. Regarding the environmental factors, young drivers have higher risk at night and at intersections compared to older drivers.

**Keywords:** young drivers, road safety, crash severity, abu dhabi

## Mohamed Shawky,[1] Mohammed Kishta,[2] Nuha M Albusaeedi[2]

[1]Department of Civil Engineering, Ain Shams University, Egypt
[2]Road and Traffic Engineer, Abu Dhabi University, UAE

**Correspondence:** Mohamed Shawky, Department of Civil Engineering, Ain Shams University, Egypt, Tel + 971 561236607, Email m_shawky132@hotmail.com

## Introduction

Each year, about 1.2million people are killed, and up to 50million are injured in road because of traffic crashes.[1] In 2008, HAAD (Health Authority-Abu Dhabi) report documented that for each 3 fatal in Emirate of Abu Dhabi (the capital of United Arab Emirates), 2 of them related to traffic crashes. Known the human factors are consider as the major cause of traffic crashes, driver's age is one of these main factors that have significant contribution in crash occurrence.[1]

Recently, many researchers giving attention to the young drivers because of the combination of youth and low inexperience puts them at high risk level. Their inexperience means they have less ability to spot hazards, and their youth means they are particularly likely to take risks but they can't act correctly during critical situations. In Abu Dhabi (AD), statistics show that 23% of sever crashes and 29% of overturned crashes were related to young driver. In addition, 26% of the fatality and 23% of the serious injuries were resulted in crashes caused by young drivers during the last 6 years (from 2010 till 2015) as shown in Table 1. Despite the increasing on the percentage of young driver's overturned crashes from 26% in 2010 up to 35% in 2015, the number of these type of crashes occurred by young driver has been decreased in the same period.

**Table 1** Statistics related to young drivers in Abu Dhabi

| Abu Dhabi emirate | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | Average |
|---|---|---|---|---|---|---|---|
| Total number of crashes related to at-fault driver | 2648 | 2382 | 2115 | 2115 | 1905 | 1857 | 2170 |
| Severe Crashes (*) | 598 | 552 | 489 | 462 | 418 | 428 | 491 |
| % of Crashes (*) | 23% | 23% | 23% | 22% | 22% | 23% | 23% |
| Total number of overturned Crashes | 468 | 431 | 354 | 305 | 254 | 270 | 347 |
| Number of overturned Crashes (*) | 120 | 120 | 99 | 90 | 80 | 95 | 101 |
| % of overturned crashes (*) | 26% | 28% | 28% | 30% | 31% | 35% | 29% |
| Total number Fatalities | 376 | 334 | 271 | 289 | 267 | 245 | 297 |
| Number of Fatalities (*) | 96 | 98 | 74 | 53 | 61 | 74 | 76 |
| % of Fatalities (*) | 26% | 29% | 27% | 18% | 23% | 30% | 26% |
| Total number of Serious Injuries | 400 | 390 | 364 | 366 | 240 | 293 | 342 |
| Number Serious Injuries (*) | 78 | 109 | 84 | 74 | 51 | 68 | 77 |
| % of Serious injuries (*) | 20% | 28% | 23% | 20% | 21% | 23% | 23% |

(*) related to young driver crashes.

In general, there is no much information in regard of young driver behavior in the Gulf Corporation Council (GCC) countries. Hence, the interaction between young drivers' behavior in terms of their involvements in traffic crashes has not been much investigated or published in prior studies. In (AD), a tangible effort has recently been done 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 245 in year 2015 (about 35% reductions). Understanding the young driver behavior is the key factor to maintain a proper reduction rate of fatalities and improving the road safety strategies. Especially in the case of UAE where more than two hundred different nationalities are living along with different education levels, culture, language, and driving skills background which creates a considerable challenge for different AD agencies that are responsible for road safety. Accordingly, the main objective of this study is to investigate the contributing factors affecting young driver risk potential to be involved in a traffic crash. Relationships between at-fault young drivers involved in traffic crashes and their demographic characteristics were investigated.

## Literature review

Who are the young drivers? In the United States drivers classified as young when they fall within the age group between 15 and 20 years old.[2] UK drivers know the young drivers as those drivers aged between 17 and 24 years.[3] In Australia, young drivers are all drivers who hold driving licenses and under the age of 25 years.[4] OECD countries, which include 41 countries, including Germany, Sweden, the Netherlands, Switzerland, Japan and South Korea know young drivers as drivers aged between 18 and 24 years.[5] Based on World Health Organization (WHO),[6] more than 1,000 people under the age of 25 years are killed in road traffic crashes around the world every day. Road traffic injuries are the leading cause of death globally among 15-19-year-olds, while for those in the 10-14-years and 20-24-years age brackets they are the second leading cause of death. Even in countries that have high level of road safety indicators such as OECD countries more than 8,500 young drivers die in every year and death rates for young drivers are about double those of older drivers. In these countries, young drivers represent about 27% of all drivers' fatalities, despite the fact that they represented only about 10% of the population. In particular, the young drivers' fatalities included nearly 4,000 fatalities in the United States, more than 750 in Germany, 645 in France, and more than 300 in Japan and Spain.[5] As a share of all driver fatalities within the EU counties, the proportion of fatalities for young drivers ranges from 18% in Denmark to 32% in Germany. In contrast, the share of this age group in the total population ranges from 8% in Denmark to 13% in Ireland. In New Zealand (2013) young drivers aged 15-24 were involved in 71 fatal traffic crashes, 485 serious injury crashes and 2,581 minor injury crashes. Of these crashes, the 15-24 year-old drivers had the primary responsibility in 55 of the fatal crashes, 394 of the serious injury crashes and 1,932 of the minor injury crashes. These crashes resulted in 64 deaths, 512 serious injuries and 2,659 minor injuries. The total social cost of the crashes in which 15-24 year-old drivers had the primary responsibility was $737 million. This is 24 percent of the social cost associated with all injury crashes.[7]

On the other hand, many studies have been conducted to examine the severity of young driver related crashes and their contributing factors. Curry et al.[9] investigated the factors affecting the young driver related crashes.[8] The data has been selected from all drivers who have an intermediate license and aged between 17-20 years old. The outcomes indicated that the crash rates were highest in the first month of obtaining the license. These rates started to decrease and once the driver transition his intermediate license to full license the rates increased again. Amarasingha et al.[9] tried to find the deference in crash involvement between young female driver and young male driver. Drivers from 15 to 24 years were considered as young drivers.[9] A logistic regression model was developed to identify the Factors which increase young female drivers' injury severity and young male drivers' injury severity. The outcomes showed that the rear-end collision & collision with vehicle are the factors affected the severity of male driver. For the female drivers, the overturn and run over crashes are the two factors that affect the crash's severity.

Alver et al.[11] evaluated traffic violation getting by young driver and the effect of this behavior on the traffic crashes. The data has been collected from face-to-face questionnaire and the target driver is the young driver aged 18-29 years old.[10] Ordered probit model & binary logit model has been used. The results revealed that the traffic crash rate was 38.3% for those who stated that they received at least one violation during the past 3 years. Dissanayake[12] investigated the effect of the single vehicle crashes by young driver on crash severity.[11] The young driver considered as 16-25 years old. A logistic regression model was used to develop a model to predict the crash severity. The results suggested that the speeding and not using a seat belt were the two most factors affect the crash severity. Dissanayake[12] developed a model to identify the factor affecting the severity of young driver related crash. The single vehicle crashes data has been used in the model. The outcome showed that the speeding and not using a restraint device for example the seat belt were the most two factors increase the crash severity. Also, the young driver crash severity determined high when the crashes occurring in the curve or on the bridge.[12]

Chliaoutakis et al.[13] examined the influence of aggressive behavior for the young driver on the traffic crashes. The data has been collected from 356 participants who aged between 18-24 years using self-reported questionnaire. The result showed that the young drivers who drive without any predefined their trip destination are more likely to involve in car crashes.[13] In other words, the young drivers who use their car just for fun and not as a transportation mean are causing many crashes. Also, it found that the age is a significant factor in traffic crashes. McGwin & Brown[14] conducted a study to identify the characteristics of young driver related crashes. The data has been collected from police-reported crashes which occurring during year 1996. The results explained that the young driver cause a traffic crash because of skill shortage and run the risk.[14] The literature review showed that not much information about the young drivers' behavior and crash related in Middle East countries. Accordingly, this paper aims to investigate the characteristics of young drivers' crashes and the contributing factors affect the severity of crashes caused by young rivers (aged 18 - 24 years old) in Abu Dhabi Emirate, the capital of the United Arab Emirate UAE.

### Data source and description

The employed data in this study was extracted from the traffic crashes database of Abu Dhabi Traffic Police for six years from 2010 to 2015. Severe crash (i.e. any crash involving at least one injury) data are used in this analysis due to the limitation of the available property damage only crash data. The database includes different sets of data groups; basic crash information, at-fault drivers and vehicle's characteristics, casualties' information, environmental and surrounds

condition, traffic violations, etc. Full data of about 12,611 crashes has been extracted and utilized in this study. It is worth mentioning that the driver's community in AD consists of more than one hundred different nationalities. Male drivers represent 85% of total number of licensed drivers and 92% has age less than 45 years. Approximately, 2947 crash report related to young driver has been used in the analysis. Young driver is defined as the driver aged between 18 to 24 years old. To achieve the objectives of this study, detailed descriptive statistical analysis will be firstly provided. After that an investigation of the contributing factor that affects young drivers' related crashes will be conduct by applying logistic regression modeling approach.

## Statistical descriptive analysis

Comparisons between at fault young drivers and others was

conducted in terms of the frequency of traffic crashes, crash severity, crash types, crash causes and traffic violations during the period 2010 till 2015 which occurred in Abu Dhabi Emirate. Figure 1 illustrates the distribution numbers of crashes and fatalities resulted from the young driver during 2010 till 2015 in Abu Dhabi Emirate. It's observed that in spite of crashes number decreased by 28% during study period, the percentage of these crashes out of total crashes has almost the same trend. On the other hand, although their fatality has been declining significantly during the study period by 23%, the percentage of these fatalities out of total crashes fatalities have significantly increased. Figure 2 presents the severe crash rate per 10,000 drivers for both young drivers and other drivers. In general, a significant increase (about 54.5%) in the young drivers fatality crashes rate was observed in the last six years. Which improve the theory of classify young drivers as a critical driver with regards to traffic safety.
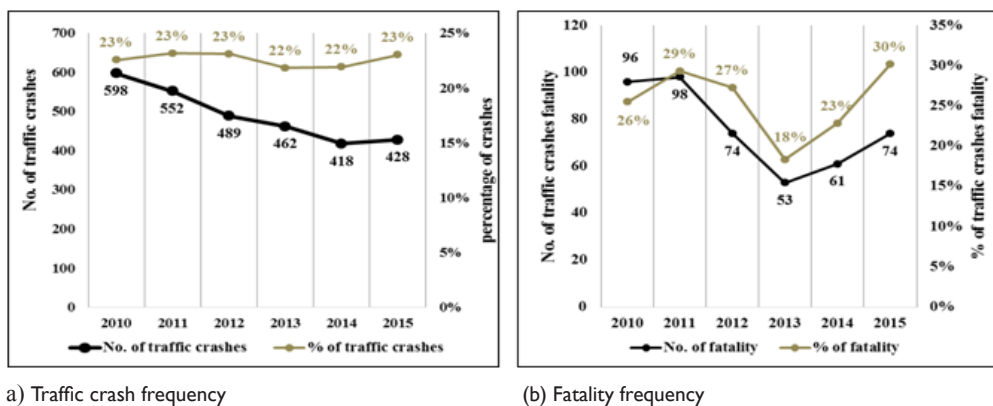


a) Traffic crash frequency



(b) Fatality frequency

**Figure 1** Young drivers traffic crashes and resulted fatalities.
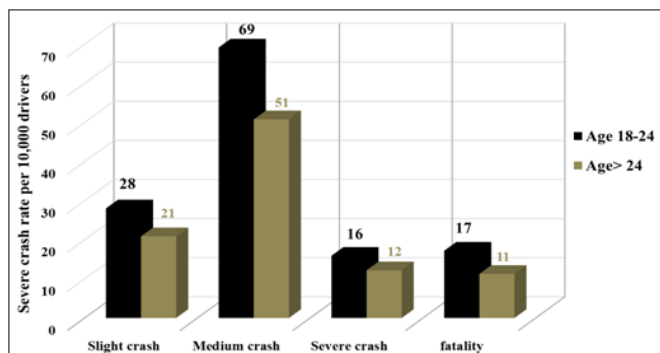


**Figure 2** Crashes severity during 2010-2015.

Table 2 shows the characteristic of at- fault driver involved in

sever crashes. The table shows that the majority (about 60%) of at fault young drivers were local. In addition, it was observed that the most age of those at fault young drivers was 23 years old, which seems that young drivers gain more confidence at this age and they tend to commit many mistakes. These findings prove the necessary of conducting educational campaigns at Universities, Colleges and high schools where young at this age found. In addition, Table 2 indicates that 74% of at fault young driver were obtained their driving license from Abu Dhabi Emirate and 13% from the other Emirates. Regarding the gender, the male young drivers were more likely to causes a severe crash than the female for both age group young driver & old driver. Figure 3 shows that the crash percentage decreases with increasing the experience years of driving up to 20 years. After 20 years of experience the crash percentage increases that can be explained due to the elder age of the drivers.

**Table 2** The characteristic of at fault drivers who involved in sever crashes in Abu Dhabi during 2010-2015

| Variable | Categories | 18-24 Year | | > 24 Year | |
| --- | --- | --- | --- | --- | --- |
| | | Frequency (Average) | Percentage | Frequency (Average) | Percentage |
| Gender | Male | 454 | 92.4% | 1417 | 89.1% |
| | Female | 38 | 7.6% | 173 | 10.9% |
| | UAE | 293 | 59.6% | 362 | 22.7% |
| | GCC | 22 | 4.4% | 52 | 3.3% |
| Nationality | Arab Countries | 69 | 14.1% | 358 | 22.5% |
| | Asian Countries | 105 | 21.4% | 767 | 48.2% |
| | Other Countries | 3 | 0.6% | 52 | 3.2% |

Table Continued....

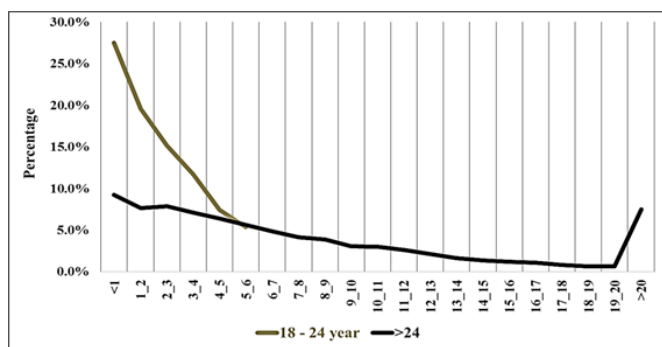| Variable | Categories | 18-24 Year | | > 24 Year | |
|---|---|---|---|---|---|
| | | Frequency (Average) | Percentage | Frequency (Average) | Percentage |
| Source of driving license | Abu Dhabi | 366 | 74.5% | 1106 | 69.5% |
| | Dubai | 27 | 5.4% | 228 | 14.3% |
| | Other Emirates | 35 | 7.2% | 126 | 7.9% |
| | GCC | 21 | 4.2% | 41 | 2.6% |
| | Others | 35 | 7.2% | 91 | 5.6% |



**Figure 3** Traffic crashes depend on driver experience.

Table 3 illustrates the characteristic of young driver related crashes. For both young drivers and others, it can be clearly observed that 82% of the injuries and fatality resulted from young driver crashes were classified as slight to middle injuries and 18% were classified as severe & fatal injuries. In addition, Table 3 shows the percentage of the highest seven causes of traffic crashes related to young drivers and others. Sudden lane change (19%), driving too fast (15%) were the main causes of young driver crashes. In general, non-significant differences exist between young drivers and others in terms of the causes of traffic crashes except a slight increment for those due to speeding. Table 3 also presents the percentage of the highest five types of traffic crashes related to young drivers and others. It was found that the highest percentage of the crash type was overturned (21%), followed by pedestrian crashes (17%), rear-end (16%), sideswipe crashes (14%) and angle crashes (13%). It shows non-significant differences in the percentage share values of the crash types over the six years for most crash types except a significant increment in overturned crashes related to young drivers.

**Table 3** The characteristic of young driver related crashes

| Variable | Categories | 18 - 24 years | | > 24 years | |
|---|---|---|---|---|---|
| | | Frequency | Percentage | Frequency | Percentage |
| Injury severity | Slight Injury | 1893 | 37.5% | 6312 | 39.6% |
| | Medium Injury | 2232 | 44.2% | 6824 | 42.8% |
| | Severe Injury | 464 | 9.2% | 1509 | 9.5% |
| | Fatalities | 456 | 9.0% | 1295 | 8.1% |
| Crash causes | Sudden lane change | 562 | 19.1% | 1575 | 17.0% |
| | Careless driving | 258 | 8.8% | 804 | 8.7% |
| | Tailgating | 313 | 10.6% | 1044 | 11.3% |
| | Driving too fast for conditions | 442 | 15.0% | 985 | 10.6% |
| | Not following road directions | 225 | 7.6% | 679 | 7.3% |
| | Un respecting of road user | 194 | 6.6% | 742 | 8.0% |
| | Running the red light | 201 | 6.8% | 997 | 10.8% |
| | Others | 730 | 24.8% | 2445 | 26.4% |
| Crash Type | Overturned | 604 | 20.5% | 1317 | 14.2% |
| | Rear-end | 471 | 16.0% | 1515 | 16.3% |
| | Sideswipe | 403 | 13.7% | 1327 | 14.3% |
| | Pedestrian | 506 | 17.2% | 1777 | 19.2% |
| | Angle | 379 | 12.9% | 1524 | 16.4% |
| | Others | 562 | 19.1% | 1809 | 19.5% |
| Area type | Rural area | 764 | 25.90% | 2496 | 26.9% |
| | Commercial area | 473 | 16.1% | 1932 | 20.8% |
| | Residential area | 747 | 25.3% | 1939 | 20.9% |
| | Others | 941 | 31.9% | 2904 | 31.3% |

Table Continued....

| Variable | Categories | 18 - 24 years | | > 24 years | |
|---|---|---|---|---|---|
| | | Frequency | Percentage | Frequency | Percentage |
| Crash Location | At Non-intersections locations | 2186 | 74.2% | 6238 | 67.3% |
| | At intersections | 432 | 14.7% | 1918 | 20.7% |
| | Roundabout | 220 | 7.5% | 641 | 6.9% |
| | Others | 87 | 3.0% | 474 | 5.1% |

With respect to the land use where the crash occurred the analysis shows that (26%) of young drivers' crashes occurred on the rural area, (25%) occurred on residential area and (16%) occurred on commercial area. Regarding to the crash location, the majority of young driver related crashes occurred at non- intersection (74%), while about (15%) occurred at intersection. Number of traffic violations can be used as an indicator of drivers' behavior changes. The database includes two types of violations; in presence by Face-to-Face tickets and in absent (by automated enforcement devices). This study used Face-to-Face tickets data to be sure that the violator driver was belongs young drivers' category. Table 5 shows that the total number of Face-to-Face traffic violations increased during the years 2010 to 2015 by 37%, while the total number of young drivers' Face-to-Face traffic violations increased by about 45%. Face-to-Face (over-Speeding traffic violations) represented about 11.31% of the total number of Face-to-Face traffic violations over study period, while (young drivers' Face-to-Face over-Speeding traffic violations) represented about 11.01% of the total number of young drivers' Face-to-Face traffic violations. Moreover, data shows that in spite of slight reduction (17%) of Face-to-Face (over-Speeding traffic violations) over study period, (young drivers' Face-to-Face over-Speeding traffic violations) significantly reduced by (35%).

**Table 4** Face-to-face traffic rule violations records

| Face-to-face violation | Years | | | | | |
|---|---|---|---|---|---|---|
| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| Total | 504,599 | 615,907 | 641,314 | 745,159 | 719,156 | 691,220 |
| Young drivers | 26,959 | 35,329 | 34,616 | 39,411 | 38,429 | 38,987 |
| Percentage | 5% | 6% | 5% | 5% | 5 | 6% |

**Table 5** Explanatory variable considered in the modeling process

| Variable | Description |
|---|---|
| Sudden_Lane_Change | = 1 if crashes occurred because of improper lane change, = 0 otherwise |
| Speeding | = 1 if crashes occurred because of speeding, = 0 otherwise |
| Tailgating | = 1 if crashes occurred because of not keeping enough space, = 0 otherwise |
| Land_Use | = 1 if crashes occurred on commercial & residential area, = 0 otherwise |
| Location | = 1 if crashes occurred at signalized intersection or roundabout, = 0 otherwise |
| Night | = 1 if the crash occurred after sun set, = 0 during daylight |
| Overturned_Crash | = 1 If Vehicle upside down, = 0 otherwise |
| Pedestrain_Crash | = 1 if vehicle hit the pedestrian, = 0 otherwise |
| Rear_End_Crash | = 1 if crash type is rear -end, = 0 otherwise |
| Object_Collision | = 1 if vehicle hit an object (tee, sidewalk, street light), =0 otherwise |
| Weekday | =1 if the crash occur during weekdays, =0 crash occur during weekend ( Friday & Saturday) |
| Multi_Vehicle_Crash | =1 if vehicle hit another vehicle, = 0 otherwise |
| Uae_Nationality | = 1 if driver is UAE Nationals, =0 otherwise |

With respect to Face-to-Face violations Figure 4A presents the number of Face-to-Face violation for every 1000 young drivers and the percentage of these violations during the period from 2010 till 2015. In general there is no significant deferent in number of Face-to-Face violation during the study period. The highest rate of these violations was in 2011 about 142 violations per 1000 young drivers and the lowest rate was in 2015 around 119 violations per 100 young drivers. Although the rate was decreased during the study period the percentage of those violations was increased. As for serious violations Figure 4B illustrates the rate of serious Face-to-Face violations and the percentage of these violations out of total Face-to-Face violations. It can be clearly observed that both the rate and the percentage of this type of violations were decreased during the study period.
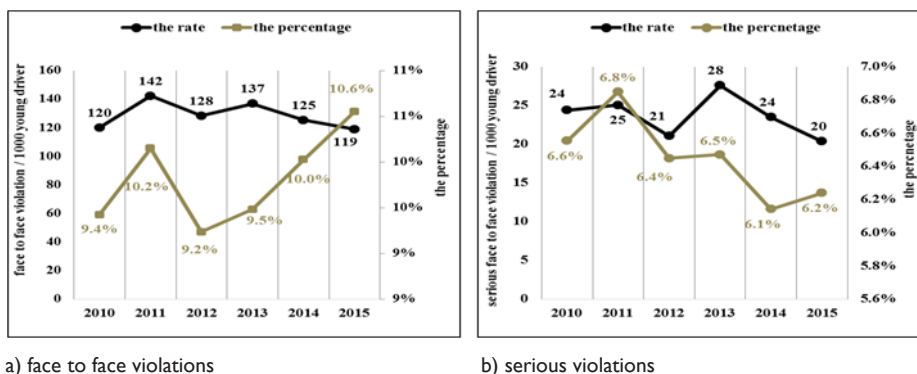
a) face to face violations



b) serious violations

**Figure 4** Young driver face to face violations.

# Logistic regression model

## Model development

In order to define the factors affecting the occurrence of young drivers' crashes combined to other drivers' crashes, logistic regression analysis applied. Binary logistic model is a good approach to deal with binary outcomes (1=young drivers' related crashes, 0=other drivers' crashes). Also, as one of the aims of the study was to develop models to predict young drivers' related crashes, logistic regression was identified as the most suitable approach to identify the important factors.

In case of binary logistic regression model, the response variable, *y* takes the form of either of the two binary values (0 or 1). For *k* explanatory variables and *i*=1, 2, 3, …, *n* individuals, the model takes the form as follows

$$log\left[\frac{P_i}{1-P_i}\right] = \alpha + \beta_1 x_{i1} + \beta_2 x_{i2} + \ldots + \beta_k x_{ik} \ldots\ldots\ldots\ldots\ldots (1)$$

$P_i$ = Prob. ( $y_i = y_1 \,|\, X_i$ ) is the response probability to be modeled,

and $y_1$ is the first ordered level of y,

$\alpha$ = Intercept parameter,

$\beta$ = Vector of slope parameters,

$X_i$ = Vector of explanatory variables.

The odds ratio for dichotomous explanatory variable, *x*, which takes value 1 or 0 (with 1 meaning that the event will certainly occur and 0 meaning that the event will definitely not occur) can be represented as the ratio of the expected number of times that an event will occur (*x*=1) to the expected number of times it will not occur (*x*=0). This can be illustrated by the following formula:

$$OR = \frac{\pi(1)/\left[1-\pi(1)\right]}{\pi(0)/\left[1-\pi(0)\right]} \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where,

OR=Odd Ratio

$\pi(1)/\left[1-\pi(1)\right]$=Probability that the event will occur when x=1

$\pi(0)/\left[1-\pi(0)\right]$=Probability that the event will occur when x=0

The model was estimated by using SPSS software package. The total number of traffic crashes involved in the model estimation is about 12,611 crashes.

## Explanatory variables

Many variables were tested includes vehicle, at-fault driver, roadway, and environment characteristics. At that stage it considered the fact that the quality of the modeling could be expected to increase to a certain level once the number of variables increases. Secondly, selection of the variables was carried out depending on the assumption that a particular variable would affect the young drivers' crashes. The descriptions of 13 explanatory variables that are considered for the modeling are provided along with their statistics in Table 5. All the explanatory variables are binary. Binary variables take the form of either 0 or 1; for example, if a crash occurs on Weekend, the variable Weekend has been assigned "1" as its value; otherwise "0" is assigned to this variable. One binary logistic regression model was developed by considering crash been related to young driver as the response variable and the description of the model which is binary in nature (Young Driver Related=1 if at fault driver is young driver (18-24 years old), =0 otherwise). The model has been development using SPSS software.

# Model results and discussion

Table 6 shows the results of the estimated parameters of the logistic regression model. The results indicate that eight variables are significantly changed for young drivers compared to others at significant of 95%. These variables are sudden lane change, driving too fast, location, when the crash occurred at night, crash type overturned & pedestrian, multi vehicle crashes and UAE nationality. The significance of sudden lane change and overturned crashes variable can be justified due to driving too fast (which is significant variable) and the desire for speed and competition cars to satisfy the desire of superiority felt by young drivers. Among these variables, young drivers' crashes have higher probability to be occurred during night time on commercial and residential areas due to the passion of young to spend the night with friends in shopping centers and cafes. In addition, pedestrian crashes of young drivers increased by 1.73 times compared to other drivers. This finding reflects the Inability of young drivers to take the right decision and right proper appreciation of the distances. Also, young drivers have more probability to be involved in multi-vehicle crashes than other drivers by about 1.57 times over. Moreover, it is remarkably that local young drivers' crashes increased by 4.44 times compared to other nationalities young drivers, although they represent about 18% of the total population. This variable can be justified due to local's high income and their ability to ownership luxurious high speed vehicles and UAE societyis characterized as a small community Age.

**Table 6** The results of the regression model

| Variables | B | S.E. | Wald | Sig. | Odds ratio |
|---|---|---|---|---|---|
| Sudden_Lane_Change | 0.176 | 0.065 | 7.396 | .007* | 1.192 |
| Speeding | 0.374 | 0.066 | 32.483 | .000* | 1.453 |
| Tailgating | 0.179 | 0.096 | 3.501 | .061** | 1.196 |
| Land_Use | -0.015 | 0.047 | 0.107 | .744 | .985 |
| Location | 0.117 | 0.047 | 6.255 | .012* | 1.124 |
| Night | 0.227 | 0.045 | 25.195 | .000* | 1.255 |
| Overturned_Crash | 0.682 | 0.221 | 9.498 | .002* | 1.977 |
| Pedestrain_Crash | 0.547 | 0.222 | 6.083 | .014* | 1.728 |
| Rear_End_Crash | 0.390 | 0.226 | 2.969 | .085** | 1.477 |
| Object_Collision | 0.409 | 0.225 | 3.306 | .069** | 1.505 |
| Weekday | -0.040 | 0.050 | 0.640 | 0.424 | .961 |
| Muti_Vehicle Crash | 0.451 | 0.218 | 4.272 | .039* | 1.570 |
| Uae_Nationality | 1.491 | 0.045 | 1105.827 | .000* | 4.439 |
| Constant | -2.540 | 0.221 | 131.955 | 0.000 | .079 |

*Significant at $\alpha$ = 0.95 level

**Significant at $\alpha$ = 0.90 level

The results also show that three variables are significant affect young drivers' crashes at a significant level of 90%. These variables are tailgating not keep a safe distance, rear-end crashes, and object collision. These findings improve the reality of Inability of young drivers to take the right decision and right proper appreciation of the distances because of limited experience.

# Conclusion

The main objective of this paper is to investigate the contributing factors affecting young driver risk potential to be involved in a traffic crash. Relationships between the at-fault young drivers involved in traffic crashes and their demographic characteristics were investigated. Traffic crashes and violations data from AD Traffic Police database during six years (2010-2015) were employed in this study. The main findings of the data analysis and modelling results can be summarized as follows:

i. About quarter of sever crashes were related to young driver. In addition, 26% of the fatality and 23% of the serious injuries were resulted because of young driver related crashes during the last 6 years (from 2010 till 2015).

ii. A significant increase (about 54.5%) in the young drivers fatality crashes rate was observed in the last six years. Which improve the theory of classify young drivers as a critical driver with regards to traffic safety.

iii. The total number of Face-to-Face traffic violations increased during the years 2010 to 2015 by 37%, while the total number of young drivers' Face-to-Face traffic violations increased by about 45%..

iv. Sudden lane change (19%), driving too fast (15%) were the main causes of young driver crashes. In general, non-significant differences exist between young drivers and others in terms of the causes of traffic crashes except a slight increment for those due to speeding.

v. No significant differences in the percentage share values of the crash types over study period for most crash types except a significant increment in overturned crashes related to young drivers

vi. Pedestrian crashes of young drivers increased by 1.73 times compared to other drivers. This finding reflects the Inability of young drivers to take the right decision and right proper appreciation of the distances.

vii. Young drivers have 1.57 times more than other drivers in case of multi-vehicle crashes.

viii. It is remarkably that local young drivers' crashes increased by 4.44 times compared to other nationalities.

# Acknowledgements

# Conflict of interest

The author declares no conflict of interest.

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