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Effect of Implementing Traffic Safety Awareness Program OnDriver's Knowledge Regarding Traffic Safety Practices In Alexandria - Egypt

Amina Ahmed Mohamed[1], NeamaYousefMohammed[2]&Ahlam Mahmoud Mohamed[3]

[1]*Assistant Professor of Community Health Nursing, Faculty of Nursing, Alexandria University, Egypt*
[2]*Lecturer, Community Health Nursing, Faculty of Nursing, Alexandria University, Egypt*
[3]*Lecturer, Community Health Nursing, Faculty of Nursing, Alexandria University, Egypt*
Corresponding Author:NeamaYousef Mohammed

Abstract: ***Background****: Road traffic accidents (RTA) havebecome an important public health concern over the past decades; it is one of the main causes of mortality and disability in the world. Driver's awareness regarding RTA is essential in decreasing accidents.* ***Aims:*** *this study aims to assess the knowledge regarding traffic safety and first aid measures among the traffic drivers in Alexandria and measure the effect of implementing traffic safety awareness program on driver's knowledge regarding traffic safety practices in Alexandria - Egypt.* ***Design:*** *A quasi experimental study design was adopted to carry out this study.* ***Setting:*** *the study was conducted at Alexandria car station (El Mokaf El Gedid).* ***Subjects:*** *by using a convenient sample a number of 40 drivers were selected.* ***Tools****: three tools were used;* ***Tool (I****) demographic characteristics and health status of the studied drivers structured interview schedule, tool* ***(II)*** *driver's knowledge regarding traffic safety practices assessment tool, and tool* ***(III)*** *entitled driver's response in traffic accident and first aid measures adopted assessment checklist.* ***Results:*** *The findings of the present study revealed that the implementation of the educational program related to RTAsafety awareness leads to improved total knowledge score among the studied drivers.* ***Recommendations:*** *Developing comprehensive coordination and cooperation protocol between Alexandria health directorate, Alexandria University,Ministry of Interior Affairs and General Directorate of Traffic Police, NGOs, and other different sectors of the community to raise community awareness about traffic accidents and its consequences. The comprehensive drink driving laws must be intensified. Act to change the mindset that roads are primarily for cars.*

Key Words: *Road Traffic Accidents, Traffic Awareness, Drivers, and Road safety*

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I. Introduction

Road traffic accidents (RTA) have become an important public health concern over the past decades, it is one of the main causes of mortality and disability in the world. The World Health Organization (WHO) estimates that death from road traffic accidents will become the fifth leading cause of death worldwide in 2030 (Mirmohammadi et al, 2013) [(1)]. Every year 20 to 50 million people involved in collisions are injured and around 1.3 million die because of the traffic accidents worldwide. Ninety percent of these victims are belong to low or middle income countries. In fact there are differences among road traffic deaths in respect of WHO Regions. The European Region cause at least 120,000 deaths and injure 2.4 million people each year, While in African Region continues to be the highest with an average population at risk of 24.1 deaths per 100,000 populations (WHO, 2013, Amo et al, 2014) [(2,3)].

However, in Egypt according to WHO global status report on road safety every year about 12, 000 Egyptians lose their lives as a result of a road traffic crash. Many thousands are non-fatally injury, which lead to long-term disability (Aghamolaeietal, 2013) [(4)].

Road traffic accidents are related to modifiable determinants, tackling them is not substantially different from tackling other health problems. a road traffic crash results from a combination of several factors that include the vehicle type, the road, in terms ofpoor road infrastructure which include design consistency and pavement surface performance (friction, texture),especially in wet conditions , the third factor is the driver, who is the main factor for the occurrence of an accident (WHO, 2010) [(5)].Unsafe and a distracted driving behavior related to driver's psycho-physical conditions, his mental workload, the reduction of the attention thresholdand the increase of the perception-reaction time resulting from frequent use of mobile phones while

driving,poor road user behavior exhibited by drivers in some developing countries may be due to their lack of knowledge about road safety rules and regulations or their general attitude toward road safety matters (WHO, 2010, Rosolino et al, 2014) [5,6].Additionally, other factors out of driver's control is the environmental factors which known by weather conditions or climate changes such as rain, snow, ice, fog, wind and temperature these factors needs a skillful driving skills to deal with such changes and preventing accidents (Rosolino et al, 2014, Chakrabarty et al, 2013)[6,7].

In this regards, it is unhappy to declare that in Egypt It is relatively easy for people to get a license without proper driving skills. Hence, emphasis on proper training of drivers through a proper driving license system should be viewed as an effective way to increase traffic safety attitude. The trends of road accidents and huge socio- economic losses shows that there is an urgent need of systematic approach and development of road safety improvement program to reduce road accidents and fatalities (Chakrabarty et al, 2013, Mehar and Agarwal, 2013) [6,7] .

Road accidents not only impose huge economic losses representing between 1-3% of annual Gross Domestic Product in most countries but also causes great emotional and financial stress to the millions of families affected. The continued steep increase in the number of road accidents indicates that these losses are undoubtedly inhibiting the economic and social development of the countries and adding to the poverty and hardships of the poor. Thus, there is an urgent need to improve safety of the roadway and its adjacent development, considering this importance of improving road safety (Chakrabarty et al, 2013, Mehar and Agarwal, 2013) [7, 8] .

Actions to prevent road traffic accidents and reduce associated mortality and disability include modifying the various factors involved in collisions. These factors may include policy change, activities toward road infrastructure improvement, as well as modifying driving behaviors and first aid training (Mehar and Agarwal, 2013, Mikušová and Hrkút, 2014, Bello and Sunday, 2012) [8-10]. The Hoddon Matrix is the most commonly used paradigm in the injury prevention field. The matrix looks at factors related to the human factors such as attitude, knowledge, and driving experience and vehicle condition as well as the environmental factors which include road design, pedestrian facilities, traffic law before, during and after an injury or death[11-15] .

Traffic safety is a multi-sectorial and a public health issue, all sectors need to be fully engaged in the responsibility. Activity and advocacy for road crash and injury prevention and providing effective trauma care services are the main concern of the community health nurse[10,16].

In fact, the awareness of members of the general public of basic first aid principles makes a significant impact on the safety issue [10,17].First aid knowledge constitutes life-saving interventions for accidents, it is important for every individual as well as more important for drivers as they are more prone to involve or witness road traffic accidents than others. In many countries, few victims receive treatment at the site of accident and fewer still can hope to be transported to hospital by ambulance since these simple actions will save their life[16-18].

That's why educational and training approaches in road safety for the key road users groups such as drivers, cyclists and pedestrians are valuable as the criterion measures to improve traffic safety[18]. So that the current study aims to implement traffic safety awareness program among traffic drivers in Alexandria.

Aims of the study

The current study aims to:

1- Assess the knowledge regarding traffic safety and first aid measures among the traffic drivers in Alexandria.
2- Measure the effect of implementing traffic safety awareness program on driver's knowledge regarding traffic safety practices in Alexandria - Egypt

Research Hypothesis:

Traffic drivers who receive traffic safety awareness program will exhibit higher knowledge score post the program implementation than before.

II. Materials & Method

Materials

Design:-A Quasi –experimental study design was used to carry out this study.

Setting: -This study was conducted at Alexandria car station (El Mokaf El Gedid). As the main station in Alexandria city that harvesting large number of drivers especially those who drive on the high way and most probably prone to road traffic accidents.

Subjects: -A convenient sample of 40 traffic drivers who accepted to participate in the study were included.

Tools: -In order to collect the necessary data for this study, the following tools were used.

Tool I:-Demographic Characteristics and Health Status of The Studied Drivers Structured Interview Schedule:

It was developed by researchers after reviewing the recent literature to collect necessary data from the drivers and include the following parts: part one: driver's demographic characteristics (age, marital status, educational level and years of experiences) part two: driver's health status which includes presence of any health problems as (liver diseases, kidney diseases, hypertension, diabetes mellitus, eye problems and vision acuity problem, previous surgical operation, smoking habits, and use of stimulants).

Tool II:-Driver's Knowledge Regarding Traffic Safety Practices Assessment Tool:

It was developed by the researchers after reviewing the recent literature to collect data about driver's knowledge regarding traffic safety awareness as, causes of traffic accidents, measures to reduce traffic accidents, acceptable speed limits on different roads and the meaning of different road traffic signs.

Tool III:-Driver's Response in Traffic Accident and First Aid Measures Adopted Assessment Checklist:

It was developed by the researchers after reviewing the recent literature to collect data about previous exposure to road traffic accidents, the response of drivers in case of traffic accident & there knowledge regarding first aid measures, criteria that should be available in rescue member, priorities for first aid conditions.

Method:The study was conducted through four phases:

1. Assessment phase:

- An official letter was issued from the faculty of nursing Alexandria University to the head of traffic station office.
- Tools were developed by the researchers after reviewing recent related literature and were tested for content validity by 5 experts professor in the related filed of Community Health Nursing. Their suggestions and recommendations were taken into consideration.
- A pilot study was conducted on 4 drivers those numbers of drivers were excluded from the studied sample; the purpose of this pilot study was to test the clarity of questioner and to evaluate the feasibility and applicability and to estimate time required for the interview. Accordingly the necessary modifications were done and the sheets were put in the final form.
- Reliability test for tool III was done, using Cronbach`s alpha test that measured the degree of reliability. It showed high reliability of the total score of the test, Alpha = 0.899.
- Final version of the tools was used to collect the data from all drivers by using tool I, II and III.
- Pre-test was done to evaluate driver's knowledge about driving speed limits, causes of traffic accidents, the meaning of different road traffic signs, and definition of first aid and criteria that should be included in the rescue member.

2. Developing phase:

- Traffic safety awareness program was carried out according to the following steps:-

Step I- Stating clear objectives;

A- General objective:

At the end of the traffic safety awareness program application the driver's knowledge regarding traffic safety will be improved.

B- Specific objectives:

- Identify the causes of traffic accidents.
- Differentiate between agriculture and desert road speed limits.
- Apply correct first aid measures for different types of injuries.

Step II- preparation and organization of the program media;

a. Preparation of media used in the program application:

- Printed materials[1,5]were developed by the researchers in order to enhancing the driver's memorization aboutthe meaning of different road traffic signs and first aid measures.
- Select suitable and culture related videos regarding first aid and traffic accidents prevention.
- Power point presentation was developed by the researchers to facilitate the concepts clarifications.

b. Preparation of the environment for conducting the program:

- Group discussion was arranged in the place of drivers meeting to conduct face-to-face meeting with the drivers in order to discuss issues related to traffic awareness.

3. Implementation phase:

This phase included the implementation of the planned program's sessions according to the following;

- The researchers were introducing themself to the drivers, and ask them to share one little known fact about themselves (Ice breaking process).

- The traffic safety awareness Program was implemented for the drivers in the form of ten sessions, one session/week , each session takes around 45 minutes and it was include the following:
  Session (1,2): Introduction about the magnitude and significant of traffic accidents, definition, causes of traffic accidents, acceptable speed limits for different roads and meaning of different road traffic signs..
  Session (3,4): Definition of first aid, criteria that should be available in person who provide first aid, goals of first aid, golden steps in providing first aid.
  Session (5,6): Primary assessment, classification and priorities of victims, principles of first aid, and the contents of first aid kit.
  Session (7,8): CPR (cardiopulmonary resuscitation) procedure for children and adults.
  Session (9,10): First aid procedure for different types of injuries (bleeding, fractures, and vertebral column injuries).
- The researchers used different teaching methods as discussion, demonstration and re-demonstrationand role play. Power point presentation,teaching aids as printed materials and videos are also used.

4. Evaluation phase:

- After the implementation of the traffic safety awareness program, the evaluation phase performed.
- At the end of the program post-test was done to determine the effect of the program on the driver's knowledge regarding traffic safety practices (Tool II).
- Data were collected by the researchers over a period of three months from October 2017 to December 2017.

Ethical considerations:

- Informed oral consent was obtained from all drivers after providing an appropriate explanation about the purpose of the study and nature of the research.
- The confidentiality and anonymity of individual responses, volunteer participation and right to refuse participating in the study were emphasized to the drivers.

Statistical analysis

- The collected data were coded and analyzed using PC with the Statistical Package for Social Sciences (SPSS version 20) and tabulated frequency and percentages were calculated.
- Count and percentage: Used for describing and summarizing quantitative data.
- Minimum, Maximum, Arithmetic mean ($\bar{x}$), Standard deviation (SD), Median were used as measures of central tendency and dispersion respectively for normally distributed quantitative data. Median was used for ranked or scored data as it is not affected by outliers or extreme values.
- Chi square: (χ^2) was used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories.
- Fisher exact and Monte Carlo test were used whenever the expected frequency of any cells of 2×2 table falls below 5.
- The one-way analysis of variance (ANOVA) as a non-parametric method for testing whether samples originate from the same distribution is used to determine whether there are any statistically significant differences between means of two or more independent groups (F test) and Friedman test is the non-parametric alternative to the one-way ANOVA with repeated measures. It is used to detect any overall differences between related means.
- The level of significance selected for this study was p value equal to or less than 0.05.
- **Knowledge scoring system:** in relation to driver's knowledge each "correct answer" will have one score while "no answer or don't know " will have zero score the total knowledge score on traffic safety practices will be calculated and transferred to percentage as the following
- Poor knowledge scores are equal to or less than median % score.
- Good knowledge scores are greater than median % score.

III. Results

Table (1) describe the demographic characteristics of the studied drivers, it was shown that more than half (57.5%) of the drivers were in the age group between 30 to less than 40 years and more than three quarters of them (77.5%) were married.Around two third (62.5%) of the drivers Just able to read and write and two fifth of them (40%) have more than 15 years of experience. Regarding to travel line it was observed that around two third (62%) of the drivers were follow Alexandria- Cairo line.

Table (1): Distribution of the Studied Drivers According to Their Demographic Characteristics

Demographic characteristics	Frequency (n 40)	
	No	%
Age (Years)		
Less than 20 years	3	7.5
20 to less than 30 years	7	17.5
30 to less than 40 years	23	57.5
40 years and more	7	17.5
Mean ±SD	35.43±9.38	
Marital status		
Married	31	77.5
Single	5	12.5
Widow	2	5.0
Divorced	2	5.0
Level of education		
Read and write	25	62.5
Preparatory level	7	17.5
Secondary level (Technical diploma)	6	15.0
Bachelorette	2	5.0
Years of experience in driving		
<5 years	10	25.0
5 to <10 years	5	12.5
10 <15 years	9	22.5
15 years and more	16	40.0
Mean ±SD	11.23±5.75	
Travel line		
Alexandria – Cairo	25	62.5
Alexandria - Tanta	15	37.5
Number of trip/day		
One trip	15	37.5
Two and more	25	62.5

Table (2) illustrate the distribution of the studied drivers according to their health status , it was observed that half (50%) of the studied drivers were not complains from any health problem ,while around one third of them were complains of backache and headache (35% and 32.5% respectively), around one quarter of them were suffering from hypertension and liver disorder (25% and 22.5% respectively) & less than one fifth were complains of renal disorder and diabetes (17.5% and 15% respectively). In relation to risk taking behavior it was found that more than half (55%) of them were smokers, it disgusting to found that, one fifth (20%) of the studied drivers using stimulants.

Table (2): Distribution of the Studied Drivers According to Their Health Status

Health status	Frequency (n 40)	
	No	%
Health complains #		
No complain	20	50.0
Backache	14	35.0
Headache	13	32.5
Hypertension	10	25.0
Liver disorders	9	22.5
Renal disorders	7	17.5
DM	6	15.0
Risk taking behaviors **A-Smoking**		
No	18	45.0
Yes	22	55.0
B-Use of stimulants		
No	32	80.0
Yes	8	20.0

 # More than one answer

Table (3) represents the distribution of the studied drivers according to their knowledge about causes of traffic accidents from their point of view, it was observed that around one third(35%),of the studied drivers mention that the track collision followed by thirty percent mentioned Trossikl and motorcycle and 27.5% of them stated and burst tire and steering wheel displacement are the main causes of RTA. Moreover, around one fifth (22.5%) of the studied drivers reported that high speed,nearly the same percent (20%) mentionedcar rollover, while(17.5%) reported that weather conditions plays an important role in the incidence of RTA and. Finally, around one tenth (15%) of the studied drivers declared that RTA may be caused due to uneven road, the

wrong way driving, while (12.5%) of them mentioned that thewrong override, sudden stop, collision between two vehicles while one tenth (10%) of them were declared that wrong exit from a branch road, driver tiredness and fatigue, and the same percent were reported that car's defects, and pedestrian crossing as causes of RTA.

Table (3): Distribution of the Studied Drivers According to Causes of Traffic Accidents from Their Point of View

Causes of accidents from the drivers' point of view#	Frequency (n 40)	
	No	%
Truck collision	14	35.0
Trossikl and motorcycle	12	30.0
Burst tire	11	27.5
Steering wheel displacement	11	27.5
High speed	9	22.5
Car rollover	8	20.0
Weather conditions	7	17.5
Uneven road	6	15.0
Wrong way driving	6	15.0
Wrong override	6	15.0
Sudden stop	6	15.0
Collision between two vehicles	5	12.5
Wrong exit from a branch road	5	12.5
Driver tiredness and fatigue	4	10.0
Car's defects	4	10.0
Pedestrian crossing	4	10.0

 # More than one answer

Table (4) illustrate the distribution of the studied drivers according to their exposure to road traffic accident , it was found that one quarter (25%) of the studied drivers were previously exposed to RTA, and all of the drivers previously observed RTA .In relation to the response of driver in accident it was observed that around one fifth (17.5%)of them reported that they call ambulance and were help in first aid, and the same percent were stop on beside road and, whereas 12.5% of them didn't stop at all and 15% of them were respond by change pathway in case of accident.

Concerning the availability of car emergency kit ,more than two third (67.5%) of the drivers did not have car emergency kit compared to the minority (7.5%) of them who have kit with complete content , sixty percent of the studied drivers consider car emergency kit is not important .More than one third (37.5%) of the studied drivers were use of seat belt in car in case of trap & less than half of them ask others in the care to use seatbelt also in case of trap, more than one quarter (27.5%) of them were permit the children to set bedside the drivers.

Regarding the ways to decrease accident from the driver's point of view ,it was found that about two third (65%) of the drivers were mentioned that infrastructure improvement and early first aid measures at the site of accident ,while less than half (45%) of them were mentioned that traffic safety instructions will decrease the accidents . The current study also found that the majority (85%) of the studied drivers were didn't t received any training to control accidents related risks compared to only 7.5% of them who received training for once or twice. Additionally, the majority (90%) of the drivers declared that they need extra training related to control accidents related risks.

Table (4): Distribution of the Studied Drivers According to Exposure to Road Traffic Accidents

Drivers exposure to road traffic accidents	Frequency (n 40)	
	No	%
Previous Exposure to Road Traffic Accident		
No	30	75.0
Yes	10	25.0
Witnessed Road Traffic Accident		
Yes	40	100.0
Driver response/action taken in accident		
Nothing	7	17.5
Call ambulance	8	20.0
Help in first aid	7	17.5
Didn't stop at all	6	15.0
Stop on Beside road	7	17.5
Change pathway	5	12.5
Availability of Car Emergency Kit		
Didn't have	27	67.5
Incomplete kit content	10	25.0
Complete kit content	3	7.5

Drivers exposure to road traffic accidents	Frequency (n 40)	
	No	%
Importance of Car Emergency Kit from the drivers' point of view		
Didn't important	24	60.0
Save life	12	30.0
Decrease complication	4	10.0
Driver's use of Seat belt		
No	6	15.0
Always	8	20.0
Sometimes (during long journey)	11	27.5
Sometimes (in case of Trap)	15	37.5
Ask others in the car to use Set belt		
No	11	27.5
Always	6	15.0
Sometimes (in long journey)	4	10.0
Sometimes (in case of Trap)	19	47.5
Permit the children to set beside the driver		
No	29	72.5
Yes	11	27.5
Ways to decrease accidents from the drivers' point of view#		
Infrastructure improvement	26	65.0
Early first aid measures at the site of the accident	26	65.0
Penalty for disorderly	22	55.0
Traffic safety instructions	18	45.0
Previous training experience related to control of accident's related risks#		
No training received	34	85.0
Once	3	7.5
Twice	3	7.5
Training topics#	n(6)	
Fire control	5	83.3
First aid	4	66.7
Disaster control	3	50
Need Extra Training	n(40)	
No	4	10.0
Yes	36	90.0

 # More than one answer

Table (5) elaborate the distribution of the studied drivers according to their knowledge related to road traffic signs, the table show that less than three quarters (72.5%) of the drivers were know the sign of Noentry and more than half (62.5%)of them know the sign of No right turn, while sixty percent of them knowing the signs of No cellular phone and Pedestrian crossing ahead. More than half (57.5%)of them were know the Road work and No stopping/No waiting signs, while one fifth (20%) of them were know the sign of Hump& more than one tenth (12.5%) of them were know the sings of Danger elevation, Roundabout, Danger & Children pedestrian crossing a head sing.

Table (5): Distribution of the Studied Drivers According to Their Knowledge Related to the Meaning ofRoad Traffic Signs

The meaning of road traffic signs		Frequency (n 40)	
		No	%
	**No entry**	29	72.5
	**No Right Turn**	25	62.5
	**No Cellular Phone**	24	60.0

The meaning of road traffic signs		Frequency (n 40)	
		No	%
	**Pedestrian Crossing Ahead**	24	60.0
	**Road Work**	23	57.5
	**No Stopping/No waiting**	23	57.5
	**Hump**	8	20.0
	**Danger Elevation**	5	12.5
	**Roundabout**	5	12.5
	**Danger**	5	12.5
	**Children Pedestrian Crossing Ahead**	5	12.5
	**Road Narrows On Both Sides**	4	10.0

Table (6) represents the distribution of the studied drivers according to their knowledge about speed limits on agriculture and desert road ,it was observed that more than one fifth (22.5%) of the drivers have correct knowledge about trailer speed limits on agriculture road ,while one fifth (20%) of them have correct knowledge regarding speed limits of trailer on desert road ,the same table showed that about one third (32.5%) of the drivers have correct knowledge regarding truck speed limits in both agriculture and desert road, it also observed that more than one tenth (15%) of them have correct knowledge about Taxi speed limitsin both agricultural and desert road. Finally, less than one fifth (17.5%) of the drivers have correct knowledge about van speed limits on agricultural road, while less than one third (30%) of them have correct knowledge about the speed limits on desert road.

Table (6): Distribution of the Studied Drivers According to Their Knowledge about Speed Limits on Agriculture and Desert Road

Speed Limits	Frequency(n 40)			
	Agriculture Road		Desert Road	
	No	%	No	%
Trailer speed limits				
60 km/hr	9	22.5	0	0.0
70 km/hr	10	25.0	8	20.0
80 km/hr	14	35.0	6	15.0
90 km/hr	5	12.5	14	35.0

Speed Limits	Frequency(n 40)			
	Agriculture Road		Desert Road	
	No	%	No	%
100 km/hr	2	5.0	12	30.0
Truck speed limits				
60 km/hr	7	17.5	0	0.0
70 km/hr	13	32.5	1	2.5
80 km/hr	11	27.5	13	32.5
90 km/hr	9	22.5	13	32.5
100 km/hr	0	0.0	13	32.5
Taxi speed limits				
60 km/hr	1	2.5	0	0.0
70 km/hr	3	7.5	0	0.0
80 km/hr	6	15.0	1	2.5
90 km/hr	5	12.5	6	15.0
100 km/hr	25	62.5	12	30.0
120km/hr	0	0.0	21	52.5
Van speed limits				
80 km/hr	2	5.0	0	0.0
90 km/hr	7	17.5	1	2.5
100 km/hr	12	30.0	12	30.0
120 km/hr	19	47.5	27	67.5

NB: **Speed limits on agricultural road**: **Trailer** (60 km/hr), **Truck** (70 km/hr), **Taxi** (80 km/hr), and **Van** (90 km/hr).
Speed limits on desert road: **Trailer** (70 km/hr), **Truck** (80 km/hr), **Taxi** (90 km/hr), and **Van** (100 km/hr)

Figure (1) shows the practices of driving speed limits of the drivers; it was observed that the majority (90%) of them were drives with high speed limits while only 10% of them were drive within the acceptable speed limits.

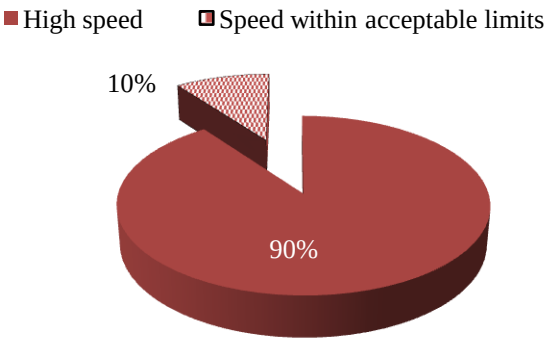

Figure (1) Practices of driving speed limits of the drivers

Figure (2) represents the driver's knowledge about ambulance call number; it was found that more than three quarters (78%) of the drivers knew the ambulance call number.

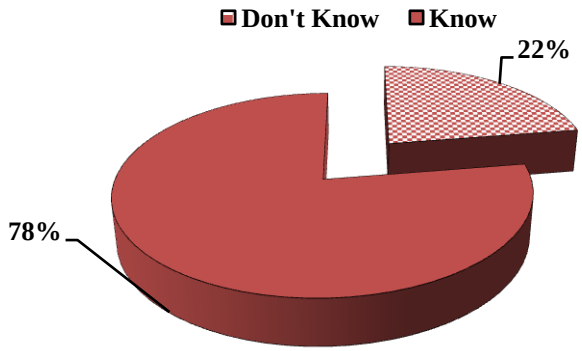

Figure (2) Driver's knoweldege about Ambulance Number

Figure (3) describe the characteristics of rescue member from the driver's perspective , it was observed that more than one third (37.5%) of the drivers stated that rescue member must be good observer, able to deal with pressure and stress, decision maker, quick witted, able to provide first aid measures, initiative, able to lift heavyweight and patient.

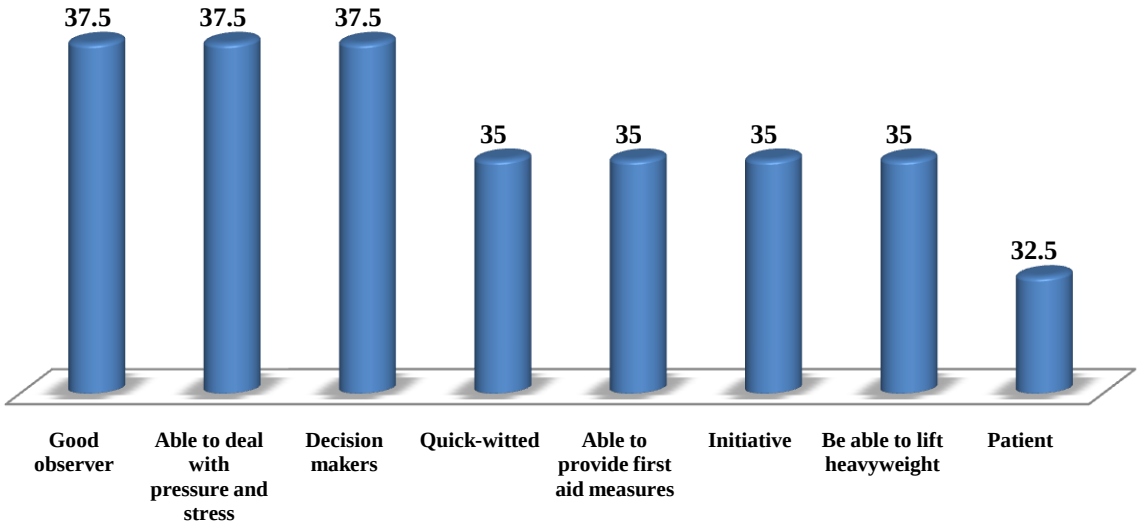

Figure (3) Characterestics of rescue member from the drivers's prespectives

Figure (4) Shows the prioritization of victim to deal with them from the drivers point of view, victim with bleeding comes first followed by those with chest injuries, those with fracture without trauma symptoms, victim with minor external wound, then shocked victim and those with vertebral column injuries listed at the last priority represent (30%, 27.5%, 27.5%, 25%and 20% respectively).

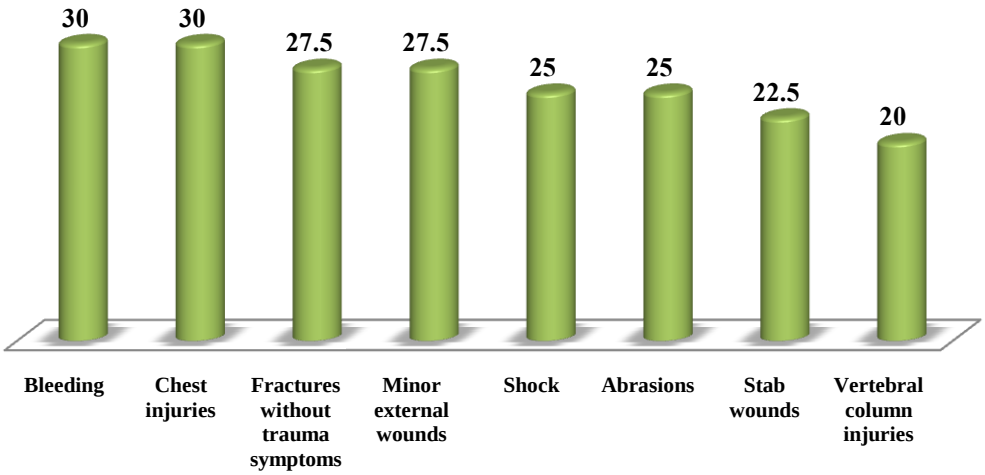

Figure (4) Classification of victims according to priorities of first aid measures from the driver's prespectives

Figure (5) elaborate the first aid measures prioritization from the drivers perspective where the majority (82.5%) of them put airway clearance first followed by avoidance of oral fluid then stop bleeding, fracture support, wound care and victim transferring (75%, 62.5%,50%, and47.5% respectively). The minorities (7.5%) of them reported that they can give food for the victim.

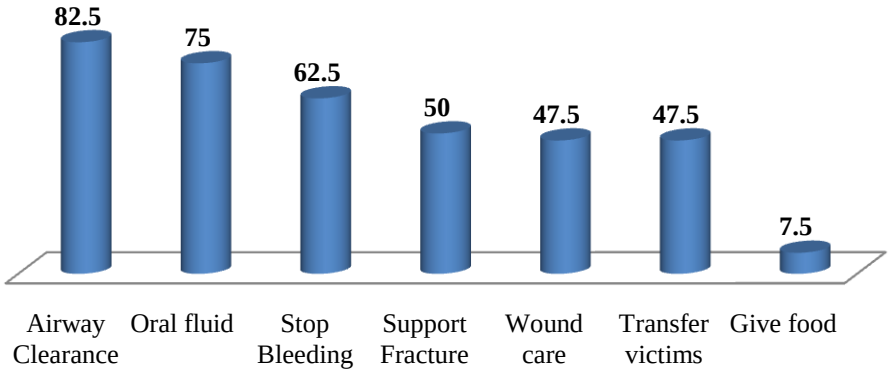

Figure (5) First aid mesures order from the driver's prespectives

Figure (6) represent the correct victim's position from the driver's perspective, it was found that only two fifth (40%) of them know the correct position (one-side position).

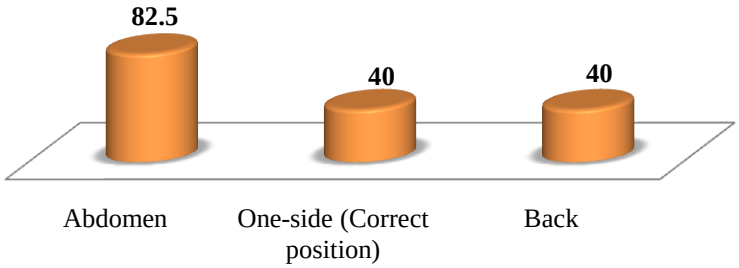

Figure (6) Correct victim's postion from the driver's prespectives

Table (7) elaborate the distribution of the studied driver's according to their knowledge regarding first aid measures, it was found that the majority (85%) of the drivers stated that they can use coffee powder to stop bleeding compared to more than half (55%) of them who reported that they can put dressing over the wound directly in order to stop bleeding safely & use of bandage for pressure. Less than one fifth (17.5%) of them added that they can elevate the arm over the level of the heart. Finally, more than one tenth (15%) of them added that they will remove old dressing and put a new one in case of bleeding. Concerning the first aid measures for head and vertebral column injuries, the table reveals that less than half (47.5%) of the drivers stated that they will transfer the client away from the site of injury while only 15% of them considering the support head & neck are valuable for the victim .

Table (7): Distribution of the Studied Drivers According to Their Knowledge on First Aid Measures

Drivers knowledge on first aid measures (From the driver's perspectives)	Frequency (n 40)	
	No	%
First aid measures for Major Injuries#		
Use (Coffee powder) to stop bleeding*	34	85.0
Put dressing over the wound directly	22	55.0
Use bandage for pressure	22	55.0
Elevate the arm over the level of the heart	7	17.5
In case of more bleeding remove the dressing and put new one*	6	15.0
First aid measures for Head and Vertebral column injuries#		
Transfer the client away from the site of injury	19	47.5
Support head and neck	6	15.0
Stop bleeding	21	52.5
First aid measures for Epilepsy#		
Give oral fluid*	34	85.0
Put the client on his back	34	85.0
Remove cloths around neck	21	52.5
Try to stop the convulsion*	19	47.5

 # More than one answer *** Incorrect answers**

Table (8) shows the relation between total knowledge score on road traffic accidents before and after educational program, it was observed that the implementation of the educational program were improve the total knowledge score regarding RTA ,a statistical significant relation was found where p value <0.05.

Table (8): Distribution of the Studied Drivers According to Their Total Knowledge Score on Road Traffic Accidents and its Prevention (Pre and Post the educational program on Road Traffic Accidents and its prevention)

Drivers knowledge on Road Traffic Accidents and its prevention	Pre-Program (n 40)		Post-Program (n 40)		Test of significance (P value)
	No	%	No	%	
Poor knowledge score (Equal to or less than median percent score)	23	57.5	13	32.5	Friedman test: 20.995 *(<0.05)
Good knowledge score (Greater than median percent score)	17	42.5	27	67.5	

*** Significant p value for Freidman test ≤ 0.05**

Table (9) shows the relation between demographic characteristics and total knowledge score of the studied drivers, it appears from the current study that there is no statistical significant relation between the driver's knowledge and their age, marital status, health complains, smoking habits and the use of stimulants (P value was 0.234, 0.494, 0.161, 0.084, and 0.274 respectively). In contrast the total knowledge score was affected by level of education, years of experience in driving, and there is a statistical significant relation was found.

Table (9): Distribution of the Studied Drivers According to the Relation between Their Total Knowledge Score and Their Demographic Characteristics and Health Status

Demographic characteristics and Health history	Driver's knowledge on Road Traffic Accidents and its prevention (n 40)						Test of significance (P Value)
	Poor n(23)		Good n(17)		Total n(40)		
	No	%	No	%	No	%	
Age (Years)							
Less than 20 years	1	4.3	2	11.8	3	7.5	FET: 2.070 (0.234)
20 to less than 30 years	3	13.0	4	23.5	7	17.5	
30 to less than 40 years	15	65.2	8	47.1	23	57.5	
40 years and more	4	17.4	3	17.6	7	17.5	
Marital status							
Married	19	82.6	12	70.6	31	77.5	FET: 4.255 (0.494)
Single	1	4.3	4	23.5	5	12.5	
Widow	2	8.7	0	0.0	2	5.0	
Divorced	1	4.3	1	5.9	2	5.0	
Level of education							
Read and write	18	78.2	7	41.2	25	62.5	FET:7.372 *(0.014)
Preparatory level	3	13.0	4	23.5	7	17.5	
Secondary level (Technical diploma)	1	4.3	5	29.4	6	15.0	
Bachelorette	1	4.3	1	5.9	2	5.0	
Years of experience in driving							
Less than 5 years	4	17.4	6	35.3	10	25.0	FET: 6.311 *(0.027)
5 to less than 10 years	2	8.7	3	17.6	5	12.5	
10 to less than 15 years	4	17.4	5	29.4	9	22.5	
15 years and more	13	56.5	3	17.6	16	40.0	
Travel line							
Alexandria – Cairo	12	52.2	3	17.6	15	37.5	X^2 : 4.972 *(0.023)
Alexandria - Tanta	11	47.8	14	82.4	25	62.5	
Number of trip/day							
One trip	11	47.8	14	82.4	25	62.5	X^2 : 4.972 *(0.023)
Two and more	12	52.2	3	17.6	15	37.5	
Health complains							X^2: 0.921 (0.161)
No	13	56.5	7	41.2	20	50.0	
Yes	10	43.5	10	58.8	20	50.0	
Smoking							X^2: 2.283 (0.084)
No	8	34.8	10	58.8	18	45.0	
Yes	15	65.2	7	41.2	22	55.0	
Use of stimulants							X^2: 0.230 (0.274)
No	19	82.6	13	76.5	32	80.0	

Demographic characteristics and Health history	Driver's knowledge on Road Traffic Accidents and its prevention (n 40)						Test of significance (P Value)
	Poor n(23)		Good n(17)		Total n(40)		
	No	%	No	%	No	%	
Yes	4	17.4	4	23.5	8	20.0	

***Significance at P value (≤0.05)** **FTT (**Fisher's Exact Test) X^2(Chi-square Test)

Table (10) show the relation between the previous exposure to road traffic accidents and the driver's health complains, use of stimulants, driving speeds and total knowledge,it was observed that the previous exposure to RTA was not affected by driver's health complains, drivers total knowledge score and drivers driving speed limits ,no significant statistical relation was found (P value was 0.222, 0.129, and 0.300 respectively) .while the previous exposure to RTA was affected by use of stimulants ,a statistical significant relation.

Table (10): Distribution of the Studied Drivers According to the Relation betweenTheir Previous Exposure to Road Traffic Accidents and Their Health Complain, Use of Stimulants, Driving Speeds, and Total Knowledge

Variables	Driver's previous Exposure to Road Traffic Accidents (n 40)						Test of significance (P Value)
	No n(30)		Yes n(10)		Total n(40)		
	No	%	No	%	No	%	
Health complains							
No	14	46.7	6	60.0	20	50.0	X^2: 0.533 (0.222)
Yes	16	53.3	4	40.0	20	50.0	
Use of stimulants							
No	28	93.3	4	40.0	32	80.0	FET: 13.333 *(0.001)
Yes	2	6.7	6	60.0	8	20.0	
Driver's total knowledge on Road Traffic Accidents and its prevention							
Poor knowledge score	19	63.3	4	40.0	23	57.5	X^2: 1.671 (0.129)
Good knowledge score	11	36.7	6	60.0	17	42.5	
Driver's driving speed limits							
High speed	26	86.7	10	100.0	36	90.0	X^2: 1.481 (0.300)
Speed within acceptable limits	4	13.3	0	0.0	4	10.0	

***Significance at P value (≤0.05)** **FET (**Fisher's Exact Test) X^2(Chi-square Test)

IV. Discussion

Drivers play a vital role in preventing a crash. Knowing the rules of the road, practicing good driving skills and demonstrate a positive and considerate attitude to other road users, and, in particular, to vulnerable road users such as cyclists, motorcyclists, pedestrians, children, people with disabilities and older people. In the interest of road safety, drivers need to be aware of the importance of gaining a good knowledge regarding first aid measures; as they can save life of others (Road Safety Authority, 2015) [(19)]. Since each year 1.25 million people die as a result of road traffic crashes and as many as 50 million people are injured. They are the leading cause of death among people aged 15-29 years (WHO, 2017) [(20)].

The current study showed that the mean age of the drivers was 35 years old, ranging from less than 20 to more than 40 years. Additionally, the mean driving experience of them was 11.2 years. Regarding to travel line around two third of the drivers were follow Alexandria- Cairo line. Finally, around two third of them were making two trips per day **(Table 1)**. These findings were similar to Adenike et al (2012) as they reported that the mean driving experience of the participants was 26.1 years. The majority of them were making one trip per day.

These long journeys put them at risk as they didn't receive adequate rest which makes them vulnerable to greater health complains that affecting their driving negatively. Where around one third of the studied drivers were complains of backache and headache, around one quarter of them suffering from hypertension and liver disorder & less than one fifth complains of renal disorder and diabetes. (**Table 2**).

In relation to the knowledge about causes of RTA from the studied drivers point of view, the current study showed that around one third of the studied drivers mention that the track collision followed by Trossikl and motorcycle and burst tire and steering wheel displacement are the main causes of RTA. Moreover, around one fifth of the studied drivers reported that high speed, car rollover, weather conditions plays an important role in the incidence of RTA. Finally, around one tenth of the studied drivers declared that RTA may be caused due to uneven road, wrong way driving, wrong override, sudden stop, collision between two vehicles, Wrong exit from a branch road, Driver tiredness and fatigue, car's defects, and pedestrian crossing (**Table 3**).

These findings supported by WHO Save LIVES road safety technical package (2017) [(20)]which reported that nearly half of the people who die on the world's roads are pedestrians, cyclists and motorcyclists. Additionally, around two fifth of the drivers in Myssayev et al study (2013) [(17)]mentioned that low drivers' discipline on the road and insufficient rate of drivers' training is one of the risk factors for RTA.

Nowadays, it noticed that the Trossikl and motorcycle especially (Tok-Tok) appear everywhere in the developing countries and in Egypt. Their driver mostly young age and they didn't discipline the road rules since they can go freely at high ways and always follow wrong road. This is a big issue that must be handled by the authorities in order to makes the road safe (WHO, 2009) [(21)].

Moreover, a study done in Vietnam (2011) [(22)] and other in Puerto Rico (2014) [(23)] reported that the causes of road traffic accidents include a high increase of registered vehicles, irrelevant infrastructure, dangerous mixed traffic flow, traffic safety education and training without expected results, and irregular enforcement. Among those factors, driver behavior is reported to be the main cause of traffic accidents. Road user error includes speeding, unsafe overtaking, drunk driving, poor road observation, and misuse of lanes and pedestrian behavior; illegal or reckless pedestrian crossing (jaywalk). All of these findings go in line with the current study findings

Regarding the previous exposure of the studied driver to the road traffic accident, it was found that one quarter of the studied drivers were previously exposedto RTA. Moreover, all of the drivers observed RTA before compared to those in Nigeria where only ten percent had witnessed RTA before. (Adenike et al, 2012) [(11)]. In relation to the response of driver in accident, around one fifth of them reported that they call ambulance and help in first aid, whereas around one tenth of them stop on beside road, or didn't stop at all and change pathway. Some of these responses considered correct response and other are not.

Concerning the availability of car emergency kit ,more than two third of the studied drivers did not have car emergency kit compared to the minority who have kit with complete content it unhappy to found that sixty percent of the studied drivers consider car emergency kit not important. This result is considered a serious finding. Since the availability of emergency kit in the car and believing its importance considered critical issue. Different researches documented that the fatality rate mainly caused by a blocked airway. On average it takes less than four minutes for blocked airway to cause death. In such situation emergency kit consider vital.

Furthermore, lack or inappropriate use of seat-belts and other safety restraints (child seats and booster seats) are risk factors for the fatalities and injuries that result from road crashes (Mohan et al, 2006) [(24)]. The current study showed that more than one third of the studied drivers were use seat belt in car in case of trap and only around one quarter uses it during long journey. Less than half of them ask others in the care to use seatbelt also in case of trap, more than one quarter of them permit the children to set bedside them in the car (**Table 4**). In contrast, Chakrabarty et al (2013) [(7)] found that drivers were found much aware about the seat belts usage while driving.

These findings highlight the driver poor road traffic awareness and reflect their needs for intensified training. In this regards, the current study also found that, the majority of the studied drivers didn't received any training to control accidents related risks compared to only around one tenth of them who received training for once or twice. Additionally, the majority of the drivers declared that they need extra training which reflects their willingness to learn (**Table 4**).

These findings were similar to Myssayev et al (2013) [(17)] who mentioned that only one quarter of the drivers received training regarding road safety and they considered it insufficient rate of drivers' training program. Additionally, Adenike et al (2012) [(11)] added that most participants believed that they could be trained and would be willing to apply first aid.

Although, the drivers training regarding first aid and proper dealing with causality is clearly crucial, the current study shed the light on the lacking of the studied drivers training regarding road safety. It may be attributed to many factors among them the driver's level of education, where more than half of the studied drivers just able to read and write that make them uninterested in receiving training. So that legislation must be intensified to makes such training an obligatory. In this regards the British Red Cross (2013) [(25)] recommends a legislative provision for demonstrating first aid practice as part of the overall test of proficiency for each individual seeking to obtain a driving license.

Furthermore, Chakrabarty et al (2013)[(7)] and Wood et al (2010) [(26)] concluded that with the better training of the learner drivers and testing techniques for issuing the license will reduce number of accidents. Awareness program on road safety will increase the safety behaviors of drivers and reduce driver errors and assist in reducing the accidents at all levels

The first minutes after a serious injury represent only a short time during which potentially lifesaving measures can be initiated and many deaths can be prevented (International Federation Red Crescent (IFRC), 2009) [(27)]; that's why the community health nurse have to encourage these legislation for obligatory first aid training for the drivers since a well-trained driver can save life.

The studied driver's knowledge related to the meaning of road traffic signs elaborated that less than three quarters of the drivers who correctly know the sign of no entry, and more than half of them know the sign of no right turn, no cellular phone, pedestrian crossing ahead, road work and no stopping/no waiting sign (**Table 5**).

Although the speed humps is one of the most effective and cost-effective road safety measures (The International Federation of Red Cross and Red Crescent Societies, 2018) [(28)]. Only one fifth of the studied drivers know the sign of hump & more than one tenth of them know the sing of danger elevation, roundabout, danger and children pedestrian crossing a head sign (**Table 5**). These findings indicate poor performance at the road, since each sign of them consider a lifesaving sign.

Speed limitsare also essential to reduce road crash deaths, especially among young pedestrians, who account for 50 per cent of road crash casualties in low and middle income countries (The International Federation of Red Cross and Red Crescent Societies, 2018) [(28)]. A 5% cut in average speed can result in a 30% reduction in the number of fatal road traffic crashes (WHO, 2017) [(20)]. When asking the studied drivers about speed limits practices, it was observed that the majority of them were drives with high speed limits while the minority of them were drive within the acceptable speed limits either on agriculture or desert road**(Figure 1)**. The same findings reported by McHugh (2011) [(29)].

So, a number of alterations need be made to the road infrastructure in order to force drivers to slow down in certain places. An effort must be made to change the behavior of users and to convince them that speed is a risk. The limits taught to learners by driving schools are quickly forgotten if they are not clearly indicated on road signs and if law enforcement is weak. Enforcing speed limits, unlike seat-belt checks, does require some investment (The International Federation of Red Cross and Red Crescent Societies, 2018) [(28)]. All of these facts confirm the current study finding regarding the ways to decrease accident from the driver's point of view, where around two third of the drivers mentioned that infrastructure improvement and early first aid measures at the site of accident and the presence of traffic safety instructions will decrease the accidents as reported by less than half of the drivers (**Table 4**).

Another worthwhile finding in the current study is the studied driver's knowledge about ambulance call number, it was found that more than three quarters of them know it **(Figure 2)**. It considered a worthy finding since it leads to affirm the rapid response of emergency service arrival time. Emergency services' response time is clearly crucial. Their speedy response to an accident to avoid complications from injuries is critical (International Federation Red Crescent (IFRC), 2009) [(27)].

In this regard, a study done in Iran (2017) documented that the response time of the emergency services arrival was longer than the standardized time. Moreover, there is an observed shortcoming in manpower who acts as a rescuemember (Ebrahimipour et al, 2017) [(30)]. So it is important to select another person in order to act as a rescue member care provider assistant. The culture of improving the skills of every one to help in causalities must be emphasized. The selection of those who can help in first aid must be based up on a standardized characteristic. In this regard, the characteristics of the rescue member from the current study driver's perspective, it was observed that more than one third of the drivers stated that rescue member must be good observer, able to deal with pressure and stress, decision maker, quick witted, able to provide first aid measures, initiative, able to lift heavyweight and patient **(Figure 3)**. All of these characteristics are truly describe the effective paramedic.

First aid is most urgent need to stabilize patient condition before any kind of intervention is sought. Regarding first aid measures order from the drivers' perspective, the majority of them put airway clearance first followed by avoidance of oral fluid then stop bleeding, fracture support, wound care and victim transferring. The minorities of them reported that they can give food for the victim (**Figure 5**).

These findings supported by Adenike et al (2012) [(11)] findings since they declared that a majority of participants correctly prioritized airway management first, while only around one third identified the correct order for all the three care areas (Adenike et al, 2012) [(11)].

Additionally, one of the important issues discussed with the studied drivers is the correct victim position, where only two fifth of them know the correct position (Recovery position) (**Figure 6**). The victim position considered as an easy action at the site of accidents and didn't need assistive devices or preparing of equipment. Since some victim may vomit and may become suffocated and may have blocked air way passenger, the correct position in such situation is a lifesaving measure.

Severe bleeding or uncontrolled bleeding is the major cause of death in traumatic conditions. Appropriate management to stop bleeding and to attain hemodynamic stability is the need of the hour and one method to counter this problem is the use of hemostatic dressings as a first line of treatment before further interventions are sought (Ketan et al, 2016) [(31)].

The current study shed the light on the studied driver's knowledge regarding bleeding and wound management, it was found that the majority of the drivers stated that they can use coffee powder to stop bleeding, compared to more than half of them who reported that they can put dressing over the wound directly

in order to stop bleeding safely & use of bandage for pressure. Less than one fifth of them added that they can elevate the arm over the level of the heart. Finally, more than one tenth of them added that they will remove old dressing and put a new one in case of bleeding. It is clearly noticed that some of these action are totally wrong and fatal while other are partially correct, so teaching the drivers how to deal with wounds is important.

Moreover, closed head injuries, usually associated with trauma, are those in which the brain has been injured but the skin has not been broken and there is no obvious bleeding. In assessing a patient with a possible closed head injury, consider the mechanism of injury and the decreased level of consciousness is the most reliable sign of this type of injury. In such condition victim transportation needs a lot of caution (Hoff, 2010) [(32)]

Concerning transferring victim of head and vertebral column injuries, the current study reveals that less than half of the drivers stated that they will transfer the client away from the site of injury while only 15% of them considering the support head & neck are valuable for the victim (**Table 7**). This finding reflects that the majority of drivers didn't know the principle of transferring victim with head and vertebral column injuries. The same findings confirmed by Zhou et al, 2010 and O'Dowd, 2010 in their studies [(33,34)].

Drunk driving has a high probability to lead to serious accidents. Even with a small amount of alcohol assumption, drivers are twice likely to be involved in traffic accidents than sober drivers (Zhao et al, 2014, Centers for Disease Control and Prevention, 2011) [(35,36)]

One of the important findings in the current study showed that the previous exposure to RTA was affected by the drivers' use of stimulants (Drunk drivers) (**Table 10**). This finding goes in line with Mohan et al (2006) [(24)] who documented that alcohol consumption by drivers puts pedestrians and riders of motorized two-wheelers at risk.

Preparing the drivers and equip them with adequate and correct knowledge regarding road traffic safety awareness and first aid activities are vital. Some countries devote the drivers' road traffic awareness and put legislation to apply it. The current study highlights that the implementation of the educational program for the studied drivers leads to a statistically significant improvement in their total knowledge score regarding RTA **(Table 8)**.

It appears from the current study that there is no statistical significant relation between the driver's knowledge and their age, marital status, health complains, smoking habits and the use of stimulants. In contrast the total knowledge score was affected by level of education, years of experience in driving, and there is a statistical significant relation was found (**Table 9**). The same findings discussed byHesse and Ofosu(2014)[(37)] since they added that the drivers responsible for two third of RTA and the older drivers produces a higher accident rate and at a peak in December.

In contrast, Kleisen(2011) [(38)] stated that young drivers are prone to over-confidence in their abilities, a misplaced sense of control and invulnerability and a desire to push themselves and their car to the limits; this is most evident in their approach to speed.

Road safety refers to measures and methods for reducing the risk of a person using the road network being killed or seriously injured (Sial et al, 2013) [(39)]. Each driver has to learn road safety measures in order to decrease or at least take a rapid action to control.

Sometimes a failure in the adaptation process occurs on the road which can lead to an accident. Such adaptation failures can be caused by a variety of interacting factors. These factors may include, inaccurate estimation of the point at which loss of control occurs, overestimation of one's own or the vehicle's action capabilities, misunderstanding of how a situation will develop, or a fast change in the demands of driving (Habibović , 2012) [(40)].

Although there are laws in Egypt on speed, blood alcohol concentration for the general population, seat-belt wearing and helmet wearing, they are poorly enforced. Sustained and highly visible policing, coupled with public education and infrastructural improvements are the key challenges which need to be addressed in order to reduce the road traffic accident and death in Egypt's roads (WHO, 2017) [(20)].

Road safety campaigns are used as a means of influencing the public to behave more safely in traffic. Road safety campaigns can be defined as purposeful attempts to inform, persuade, and motivate a population (or sub-group of a population) to change its attitudes and/or behaviors to improve road safety, using organized communications involving specific media channels within a given time period (Hoekstra, 2011) [(41)] . It can have many and multiple purposes, such as informing the public of new or little known traffic rules, increasing problem awareness or convincing people to refrain from hazardous behaviors and adopting safe ones instead.

Community health nurse has a significant role in carrying discussions with stakeholders on RTAs issues regarding the speeding as a major cause of accidents, importance of encourage young people to be more careful on roads, be involved in planning for traffic campaigns, put practical steps to encourage better cooperation among the teams involved in RTAs, ways to encourage collaboration between the police and stakeholders as regards traffic issues, as well as endless value of traffic accident Investigation and traffic awareness programs (Hammoudi, 2014) [(42)].

Additionally, the community health nurse must be aware by an accident black spot as a term used in road safety management to denote a place where accidents are concentrated. It may occur for a variety of reasons, such as a shape drop or corner in a straight road, so oncoming traffic is concealed, a hidden junction on a fast road, poor or concealed warning signs at cross roads and so on, and orient the drivers how to deal with such condition (Zakaria, 2010) [(43)].

V. Conclusion

The findings of the present study revealed that, the implementation of the educational program related to RTA awareness leads to improved total knowledge score among the studied drivers. Where, the total knowledge score was affected by level of education, years of experience in drivingthat confirmed bya statistical significant relation. Whereas, there is no statistical significant relation between the driver's knowledge and their age, marital status, health complains, smoking habits and the use of stimulants. Finally, one of the important findings of the current study revealed that the previous exposure to RTA was affected by use of stimulants.

VI. Recommendations

Based on the results of the present study, the following recommendations are suggested:

1- Developing comprehensive coordination and cooperation protocol between Alexandria Health Directorate, Alexandria University, Ministry of Interior Affairs and General Directorate of Traffic Police,NGOs, and other different sectors of the community to raise community awareness about traffic accidents and its consequences.
2- Encouraging the mass media to highlight road traffic accidents among youth.
3- Enforce and implement thedrink–driving laws. Act to change the mindset that roads are primarily for cars.
4- Put legislation for obligatory first aid training for every driver who looking for driving license issue.
5- Alteration of the infrastructure and roads in order to maintain safety everywhere and Install weather stations along the route.
6- Provide accurate and timely information about the status of the weather, in addition to enhancing the use of safety warning signs in slippery places. Observing speed limits by drivers on the road during bad and rainy weather.
7- Coordination and continuous communication between the police Meteorological Organization, Egyptian Red Crescent, Emergency Transportation for crisis situations and establish rescue centers.
8- Enforcement of laws supportive of road safety and penalty must be intensified among those who didn't have emergency kits in the care. Prohibit and control of Tok-Tok use especially on the high way.
9- Further researches on driver's addiction are needed.

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