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| RESEARCH ARTICLE

Investigating the Factors that Increase Traffic Accidents and Choosing Appropriate Solutions for Afghanistan's Roads

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| ABSTRACT
Generally, traffic problems and issues are divided into two functional and safety categories. Functional problems appear in the form of long delays in one or more directions of movement and safety problems, usually in the form of multiple interferences, incorrect maneuvers, non-compliance with traffic control devices, and, ultimately, accidents. Obtaining sufficient and reliable information for making decisions and implementing effective interventions in the field of reducing traffic accidents is of particular importance. This study was conducted with the aim of investigating the factors that increase accidents and providing correct solutions. In order to obtain the basic factors of the increase in accidents and to introduce suitable solutions, a questionnaire with the content of the factors of the increase in accidents and reduction of road accidents in Afghanistan was prepared and arranged and given to the people (drivers, passengers, pedestrians, managers). traffic, traffic police, and civil servants) was distributed at different levels (Bac Loria, bachelor, master, and doctorate). After collecting and analyzing the questionnaires, the field data was analyzed by the SPSS program, and according to the output of the program, among the 21 questions of the questionnaire, the questions that need to be answered have received more attention. In this study, excessive use of depreciated cars, non-existence of stops, non-observance of traffic rules (driving), and non-standard transport routes are increasing factors, as installation of traffic signboards in prominent places, the separation of roads based on the nature of light and heavy vehicles, the correct use of public roads, compliance with the speed limit and not overtaking the zigzags of cars. Legal dealings with violators were known to be the factors that reduce accidents, and Eliminating the increasing factors and considering the decreasing factors of this research is offered to the competent authorities.

| KEYWORDS

Afghanistan Roads, Increase in Accidents, Reduction of Accidents, SPSS, Traffic Laws, Traffic Stops

| ARTICLE INFORMATION

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1. Introduction

In the world, the most important cause of accidents and injuries is traffic accidents. In general, every accident that occurs is caused by four factors: human, road, vehicle, and environment. According to the statistics of the World Health Organization regarding road accidents in 2018, one person died every 24 seconds on the world's roads. According to the same statistics, road accidents are the eighth main cause of death for people of all ages and the first main cause of death for the age group of 5-29 years [Abedi et al 2023]. Statistics also show that the total number of traffic injuries in the world is increasing, but the overall trend of death due to traffic injuries in high-income countries has been decreasing since the 1970s, and in low- and middle-income countries, it is increasing [Bener et al 2003]. There has been an increase. More than half of road deaths are among pedestrians, cyclists, and motorcyclists, which are often neglected in the design of road traffic systems in many countries [Elefteriadou 2016].

Injuries caused by road accidents are one of the most important causes of death in Afghanistan. The presence of accident-prone spots on the road, non-observance of regulations by drivers, technical defects of cars, lack of awareness, attitude, correct operation, and in one sentence, "weakness of traffic culture" are the factors that have caused an increase in heartbreaking accidents and complications caused by It includes deaths, disabilities, unemployment, financial damage and the occupation of thousands of hospital beds [Gholami et al. 2019].

2. Literature Review

The expansion of communication and the development of urbanization, along with the growth of industry and the introduction of technology into human life, have made accidents and accidents, especially traffic accidents, one of the important and threatening factors of human life. Traffic accidents are the most important cause of accidents and injuries in the world [Hagan et al 2021]. Accidents are actually a part of the price that humans pay along with the advancement of technology, which has specific and different causes, and its prevention requires attention to the causes and nature of accidents [Peden et al. 2008]. William Haddon considers the factors affecting the number and severity of accidents to be behavioral factors, environmental and social factors (factors related to the road), and factors related to vehicles [Petridou et al. 2000]. These ratios have been mentioned in the world as 70% for human power, 15% for vehicles, and 15% for roads [Trimponias et al. 2019]. It is obvious that the main factor in the severity of accidents is high and illegal speed, which should be resolved with national determination. According to the demands and research conducted in more than 16 countries of the world, it has been determined that in 97% of accidents, human factors have been involved, of which the human role alone is 70%, and in 30% of cases, humans interact with the road and the vehicle play a role [Eluru et al. 2008].

In the research of Tehran's highways and their analysis, to investigate the effect of personal and environmental factors on the occurrence of pedestrian accidents, such as the effect of the physical, mental and psychological condition, gender, level of education and age of pedestrians and drivers, the place of occurrence Accidents, the time of the accident, weather conditions, the amount of light in the environment, etc., were discussed, and at the end, solutions to reduce accidents were presented. In an article, they have discussed "Investigation of factors affecting pedestrian accidents". The results of this study show that in inner-city accidents, with a prediction of 95% of factors affecting the occurrence of accidents, factors such as crossing the road, allowing pedestrians to cross the marked paths, and standing on the side of the pedestrians can be prioritized in order of priority. He considered the road to be effective in the occurrence of pedestrian accidents [Peden 2008]. In the article entitled "Examination and presentation of solutions to reduce vehicle accidents with pedestrians", an attempt has been made to provide effective suggestions with a general overview of the implementation of AASHTO strategic plans regarding road safety [Trimponias et al. 2019]. The results of this research show that building fences and guiding pedestrians to use pedestrian bridges by equipping the bridges with electric stairs has an effective role in the safety of intersections [Elefteriadou 2016]. It is very effective to remove visibility barriers, including newsstands near intersections that reduce visibility. Also, creating lighting in the middle and islands of the shelter and removing the shrubs around these areas at night will have a significant effect on the safety of pedestrians and the visibility of pedestrians in the second stage of crossing [Xing et al. 2014].

Injuries caused by traffic accidents are the main cause of death, disability, hospitalization, and also lost economic costs in the world. According to the statistics of the World Health Organization in 2018 AD, about 35.1 million people lost their lives in road accidents every year, and the casualty rate due to accidents was 2.18 per 100 thousand population for the years 2000 to 2016 AD. is; In addition, between 20 and 50 million people suffer from injuries and disabilities [Calvo-Poyo et al. 2020]. All over the world, pedestrians and motorcyclists are known as vulnerable road users, with an average share of 26 percent; this share is 44 percent in Africa. In Iran, of the total driving fatalities in 2017 (16,984 people), 20.8 percent, i.e., 3,532 people, were pedestrians, and 8.23 percent, i.e., 4,420 people, were riding motorcycles; This is while the number of people who died due to driving accidents in 2018 reached 17,183 and the number of injured people reached 367,440 [Hagan et al. 2021]. The level of vulnerability of pedestrians and motorcycle riders is due to the low level of protection of this group of road users. In driving accidents, pedestrians have the least level of protection. Therefore, in accidents, they suffer the most damage and attribute a very high percentage of injuries and losses to themselves because the accident of a vehicle with a pedestrian almost inevitably leads to the injury or death of the pedestrian. Studies show that the risk of injuries for pedestrians and their casualties is much higher than for passengers and drivers of cars [Petridou et al. 2000].

3. Methodology

In the present era, developed countries have focused most of their infrastructure on transportation projects. Because they consider trade relations and transit routes between domestic and foreign cities to be a factor of progress; therefore, transportation routes should be planned and adapted according to domestic and international standards. On the other hand, the non-existence of roads according to international standards will cause road accidents and increase the death of people.

This research is in order to identify the factors that increase accidents and propose suitable solutions by distributing questionnaires at different levels (drivers, representatives of small cars, traffic managers, traffic police, government employees, riders, and pedestrians). After distributing the questionnaire and collecting the field data, the data was analyzed and analyzed with the help of SPSS software, and the results of the constructive theories of the audience can be seen in the following tables:

Table 1. Gender

Gender		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Man	50	100.0	100.0	100.0

Table 2. Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bac Loria	10	20.0	20.0	20.0
	Bachler	29	58.0	58.0	78.0
	Master	7	14.0	14.0	92.0
	Doctor	4	8.0	8.0	100.0
	Total	50	100.0	100.0	

Table 3. Marital Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	24	48.0	48.0	48.0
	Married	26	52.0	52.0	100.0
	Total	50	100.0	100.0	

Table 4. Excessive use of depreciated cars

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	a lot of	20	40.0	40.0	40.0
	more	18	36.0	36.0	76.0
	Medium	10	20.0	20.0	96.0
	low	1	2.0	2.0	98.0
	very low	1	2.0	2.0	100.0
	Total	50	100.0	100.0	

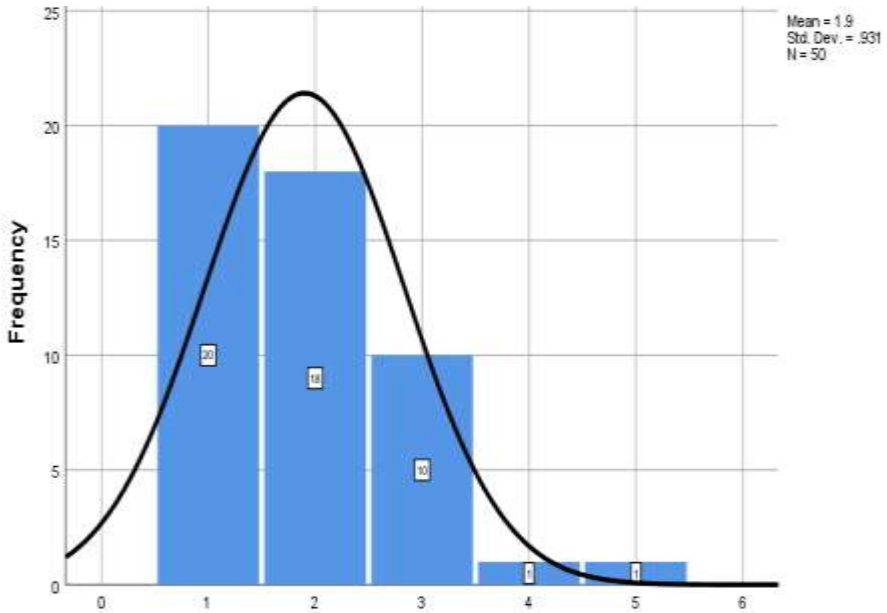

Figure 1. Excessive use of depreciated cars

Table 5. Failure to follow driving rules

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	a lot of	31	62.0	62.0	62.0
	more	14	28.0	28.0	90.0
	Medium	2	4.0	4.0	94.0
	low	3	6.0	6.0	100.0
	Total	50	100.0	100.0	

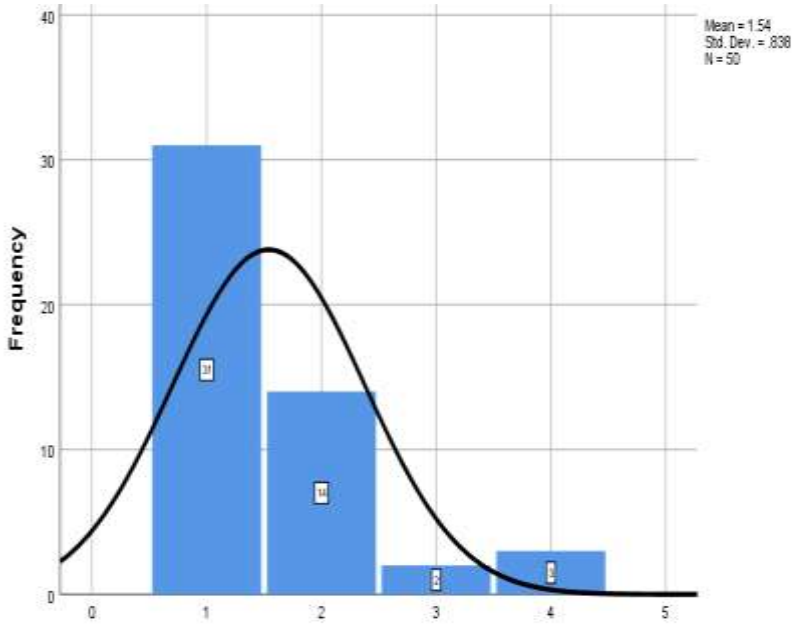

Figure 2. Failure to follow driving rules

Table 6. Non-standard transport routes between provinces

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	a lot of	25	50.0	50.0	50.0
	more	13	26.0	26.0	76.0
	Medium	6	12.0	12.0	88.0
	low	4	8.0	8.0	96.0
	very low	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

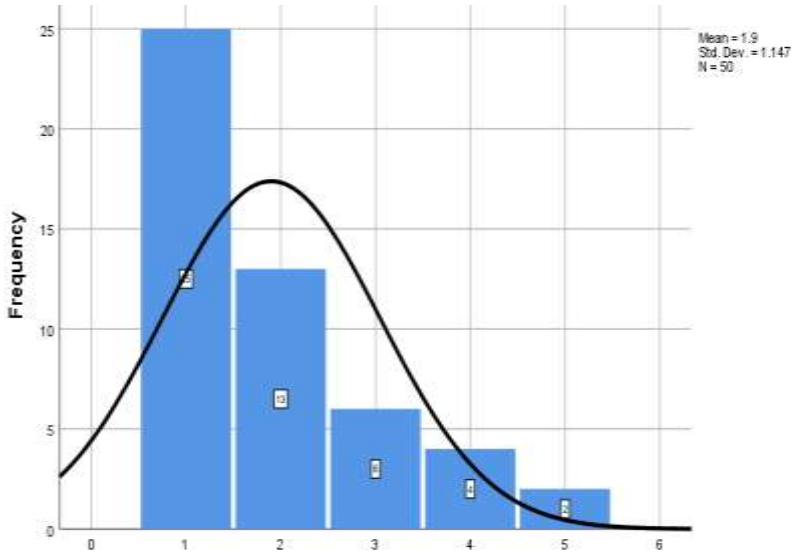

Figure 3. Non-standard transport routes between provinces

Now, after examining and determining the factors that increase accidents, suitable alternatives and factors that reduce accidents were considered with the help of SPSS software, which can be seen in the tables and graphs below:

Table 7. Road design according to national and international standards

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	a lot of	21	42.0	42.0	42.0
	more	17	34.0	34.0	76.0
	Medium	7	14.0	14.0	90.0
	low	3	6.0	6.0	96.0
	very low	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

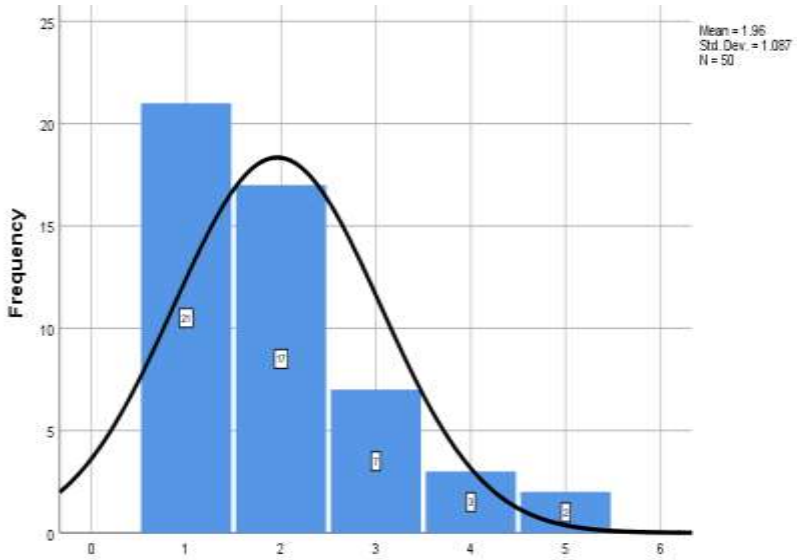

Table 4. Road design according to national and international standards

Table 8. Separation of roads based on the nature of heavy and light vehicles

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	a lot of	25	50.0	50.0	50.0
	more	12	24.0	24.0	74.0
	Medium	7	14.0	14.0	88.0
	low	4	8.0	8.0	96.0
	very low	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

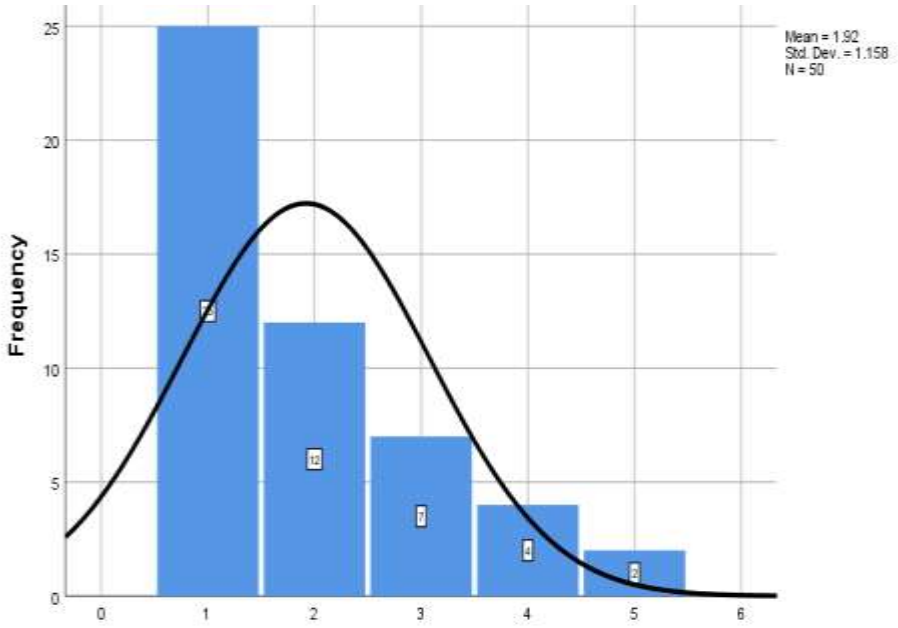

Figure 5. Separation of roads based on the nature of heavy and light vehicles

Table 9. Driving license renewal with traffic conditions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	a lot of	22	44.0	44.0	44.0
	more	14	28.0	28.0	72.0
	Medium	8	16.0	16.0	88.0
	low	4	8.0	8.0	96.0
	very low	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

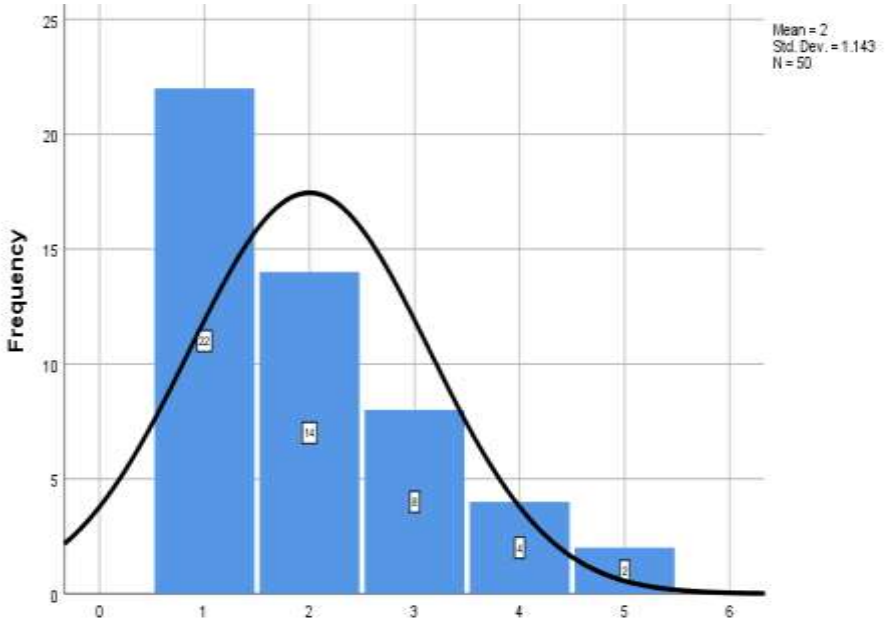

Table 6. Driving license renewal with traffic conditions

Table 10. Proper use of public roads

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	a lot of	17	34.0	34.0	34.0
	more	16	32.0	32.0	66.0
	Medium	11	22.0	22.0	88.0
	low	4	8.0	8.0	96.0
	very low	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

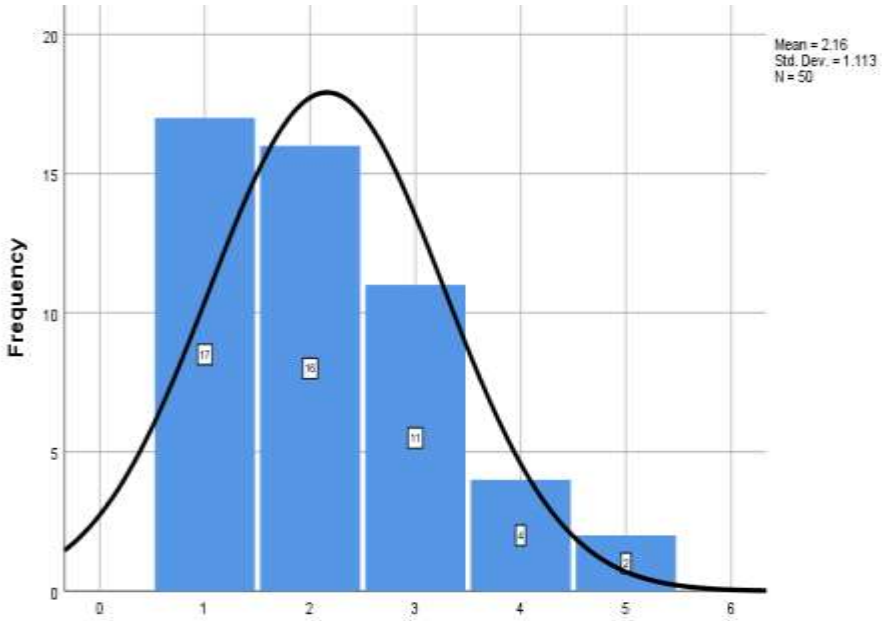

Figure 7. Proper use of public roads

Table 11. No unnecessary design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	a lot of	18	36.0	36.0	36.0
	more	15	30.0	30.0	66.0
	Medium	8	16.0	16.0	82.0
	low	7	14.0	14.0	96.0
	very low	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

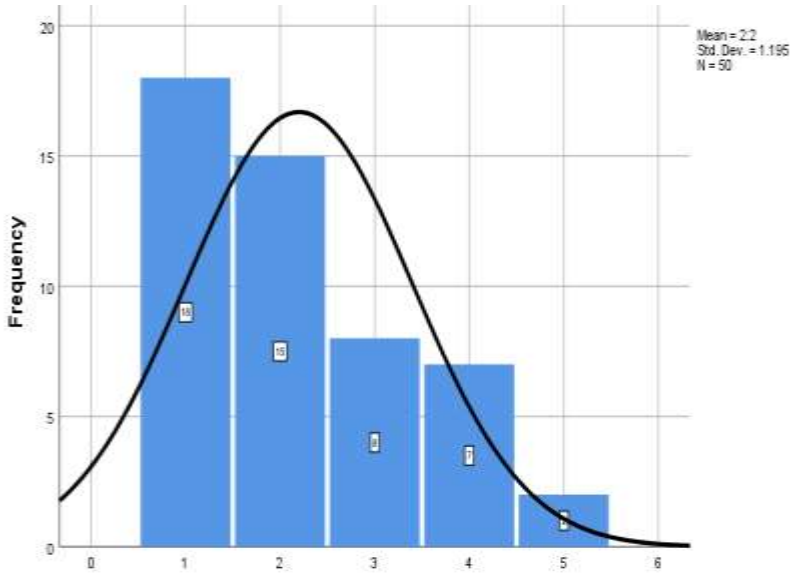

Figure 8. No unnecessary design

Table12. Legal dealings with offenders

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	a lot of	26	52.0	52.0	52.0
	more	13	26.0	26.0	78.0
	Medium	5	10.0	10.0	88.0
	low	4	8.0	8.0	96.0
	very low	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

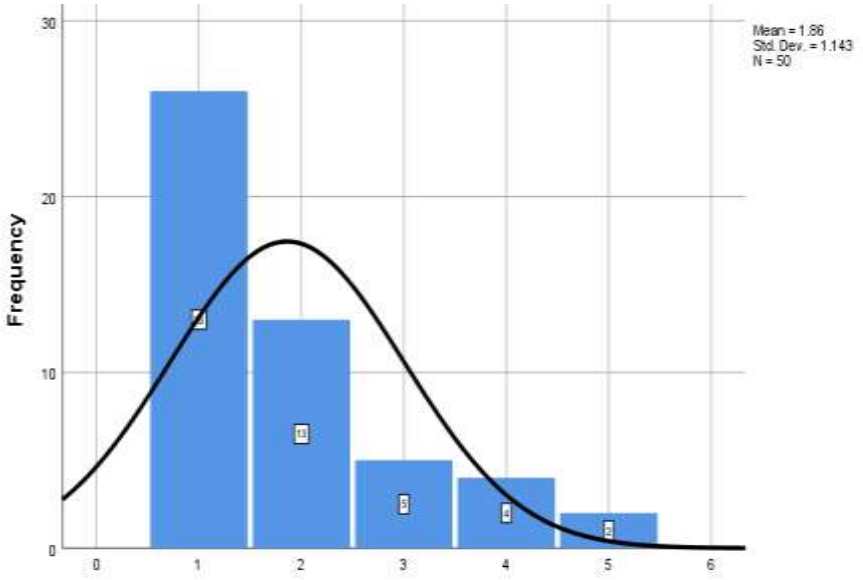

Figure 9. Legal dealings with offenders

Table 13. The driver does not use drugs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	a lot of	31	62.0	62.0	62.0
	more	9	18.0	18.0	80.0
	Medium	8	16.0	16.0	96.0
	low	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

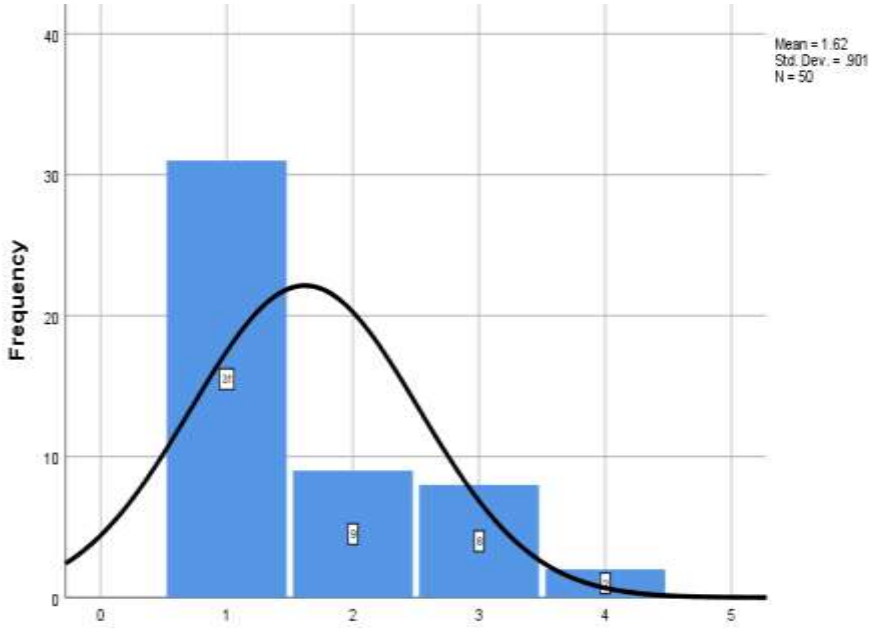

Table 10. The driver does not use drugs

4. Results and Discussion

In order to get the desired results, field data (answers to questionnaires) were categorized, analyzed, and reviewed; Excel and SPSS programs played a major role in this review, taking into account the principles of research and statistics. Questionnaire questions received more attention than the audience chose and emphasized more. Therefore, in order to prevent the increase in accidents, depreciated cars should not be used, and traffic signs and stops should be considered in appropriate positions. On the other hand, the incorrect design of the roads or the non-standardization of the transportation roads (separation of the roads based on the

nature of light and heavy vehicles) causes an increasing increase in road accidents, which should be taken into consideration by the relevant departments. It was also observed that legal dealings with violators, compliance with the speed limit and overtaking, and proper use of public roads (preventing street markets and feeding grain on the road) reduce accidents on the road. Also, in this research, it was determined that correct policy making, targeted planning, education and culture building, being patient and making appropriate decisions after getting rid of anger and fatigue, observing the speed limit and observing a safe distance, using seat belts, improving the quality of cars, proper vision While driving, the use of a special seat for children and the use of a helmet will significantly reduce accidents on the road.

5. Conclusion

The current research started with the approach of complying with the policies of the regulations and national and international standards in order to identify the factors of accidents and traffic incidents on the internal transit roads of Afghanistan, first by distributing questionnaires at different levels of the society (in terms of literacy, attitude, and performance) constructive and efficient, it was collected and analyzed; first, the answers of 21 questions of the questionnaire were entered into the SPSS program, taking into account the personal questions of the audience, and the realistic output was obtained. The results of the research showed that the main factors of the increase in accidents are the excessive use of depreciated cars, the lack of stops, the non-observance of traffic rules (driving), and the non-standardization of transportation routes, and the factors of reducing accidents are the installation of signs. Traffic signs at prominent points, the separation of roads based on the nature of light and heavy vehicles, the correct use of public roads, compliance with the speed limit and not overtaking zigzag cars, and legal dealings with violators were recognized and to reduce Accidents and the creation of facilities, the output of this research should be used as an effective and sustainable source.

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