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Research Article

Analyzing the Key Contributing Factors to Traffic Accidents in Jordan

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ABSTRACT

Traffic accidents continue to be a major public safety concern in Jordan, and several contributing factors influence their frequency and severity. This study aims to analyze public perceptions regarding the primary causes of traffic accidents, the effectiveness of traffic laws, and potential measures to improve road safety. Based on a survey of 40 questions, the findings indicate that (100%) of the population believes in the effects of road lighting. A very significant majority, (96.4%), of respondents thought that in-car technology use increases accidents. Driver distraction, reckless driving, poor enforcement of traffic laws, weariness, inadequate road infrastructure, driver distraction, and adverse weather conditions are among the most significant contributors to road accidents. Additionally, respondents highlighted the need for stricter penalties, enhanced driver education programs, and improved traffic management systems to mitigate risks. The study also explores a portion of the population (96.4%) that believes that the availability of alternatives to private transportation helps to significantly lower the number of traffic accidents, the role of public awareness, and perceptions in shaping road safety policies. The results underscore the importance of a multi-faceted approach, integrating law enforcement, infrastructure development, and public awareness campaigns to reduce traffic accidents in Jordan. The findings provide valuable insights for policymakers and stakeholders.

Keywords: Driver behavior, public perception, road safety, road infrastructure, traffic accidents.

INTRODUCTION

Traffic accidents are a major public health and safety concern worldwide, contributing to significant loss of life, injuries, and economic burdens. Roads cover around 0.5% of the Earth's surface [1]. According to the World Health Organization (WHO), road traffic injuries are one of the leading causes of death globally, with low- and middle-income countries experiencing the highest fatality rates due to inadequate infrastructure, poor law enforcement, and reckless driving behavior [2]. The economic cost of all fatalities and injuries comprises the largest cost item, about two-thirds of the total cost, and the economic cost, considering pain, grief, and suffering, is the second largest. Travel delay cost also comprises a significant item [3]. Distracted driving is the second most frequent driver fault causing crashes on both rural and suburban roadways [4]. As the speed limits increase, the severity of injuries also increases. For instance, fatal accidents occur on arterial roads due to the high-speed limit of approximately 100 km/h [5]. Jordan is no exception, as road accidents continue to pose serious threats to public safety, with thousands of reported incidents annually [6]. In addition, the development of highways in Jordan is growing, which demands clean and inexpensive energy sources [1]. Solar panels could be used for traffic safety purposes in terms of alerting drivers by operating alarm devices that warn drivers of any dangers they might encounter on the road [1]. Public perception plays a crucial role in shaping traffic safety policies. Understanding societal attitudes towards road safety regulations, law enforcement effectiveness, and infrastructure development can help policymakers implement targeted interventions. The use of renewable energy resources plays an important role in the future carbon-free energy supply for various applications such as heating, electricity, transportation, and safety [1]. This study aims to explore public opinions on the leading causes of traffic accidents in Jordan and assess potential measures to enhance road safety.

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By analyzing survey responses, the research identifies key areas that require immediate attention, such as stricter penalties for violations, improved traffic management systems, and awareness campaigns to educate drivers and pedestrians.

METHODOLOGY OF WORK

Concern is growing over Jordan's rising traffic accident rates, which reflect a problem that societies around the world face. This paper details a comprehensive methodology employed to conduct in-depth research into public perceptions concerning the underlying causes of this escalating problem within Jordanian society. Like many nations, Jordan is grappling with an alarming surge in traffic accidents, incidents that tragically lead to fatalities, injuries, and often, long-term disabilities for those involved. A multitude of factors, including defects in both roads and vehicles, contribute significantly to these unfortunate occurrences. The persistent and growing societal anxiety surrounding the alarming rise in traffic accidents underscores the urgent need for comprehensive research. Such research is vital to gaining a deeper and more nuanced understanding of the public's perceptions regarding the reasons behind these unfortunate incidents on Jordan's roads. The core objective of this study is to illuminate the opinions held by the Jordanian public regarding the primary reasons contributing to the increasing rates of traffic accidents. To achieve this, the research specifically targets drivers residing in all governorates across Jordan. The focus is on investigating their individual and collective perceptions of the various factors believed to be responsible for traffic accidents. The carefully chosen sample for this study is intended to provide valuable insight into the broader societal perspective on traffic accidents, thereby significantly contributing to the existing body of knowledge surrounding this pressing issue. The data gathered will assist in clarifying the prevailing opinions within the community regarding accident causation. To ensure a representative and comprehensive understanding of public opinion, an area-based sampling approach was meticulously adopted. Within this framework, random selection techniques were employed to choose a sample of public opinions. These opinions were gathered through a structured questionnaire specifically designed to accurately represent the diverse perspectives found across the different regions of Jordan. The demographic and other pertinent characteristics of the selected sample were carefully considered. These characteristics were then strategically utilized to investigate the various proposed reasons for the accidents as perceived by the public. This analysis allowed for a deeper understanding of how different segments of the population perceive the causes of traffic accidents. The focus of this study was asking drivers from different backgrounds and viewpoints thoughtful questions in order to gather public opinions about the underlying causes of traffic accidents in Jordan. In the end, this in-depth investigation sought to promote a deeper understanding of road safety perceptions that are common among Jordanians, offering insightful information that can guide future strategies and interventions to address the issue of rising traffic accidents. The study's design was naturally intended to thoroughly capture a variety of viewpoints and enhance the understanding of road safety and accident causality in Jordan.

RESULTS AND DISCUSSION

According to Figure 1, 89.3% of respondents, a sizable majority, reported having seen traffic accidents involving vulnerable road users, like cyclists and pedestrians. This suggests that these groups are exposed to a high level of road safety issues.

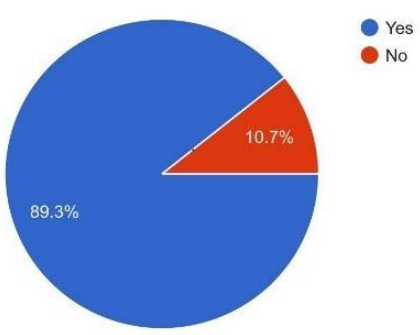

Figure 1. Percentage of people who have seen a pedestrian or cyclist involved in a traffic accident.

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Figure 2. Indicates a moderate level of public awareness regarding the consequences of unsafe driving practices, with 62.5% of respondents believing that the public is adequately informed about the consequences of traffic violations.

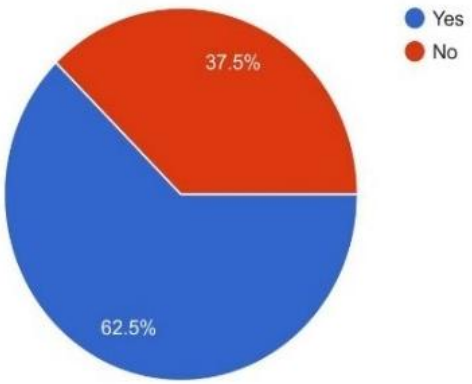

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Figure 2. Percentage of people who are aware of the consequences of unsafe driving practices.

Figure 3 indicates 81.3% of respondents have experienced road rage or aggressive behaviour from other drivers, highlighting the prevalent issue of driver aggression in Jordan.

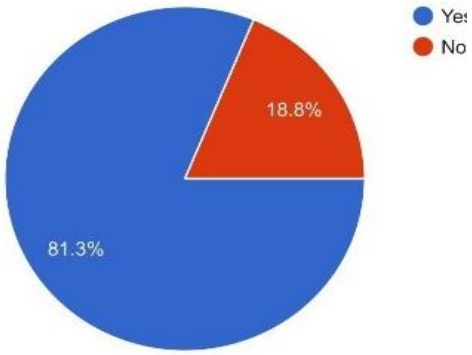

Figure 3. The proportion of people who have been the target of aggressive or road rage incidents.

Furthermore, Figure 4 indicates that around 75% of the population sees the need for increased public awareness regarding the dangers of speeding, underscoring the public's concern about this specific risk factor.

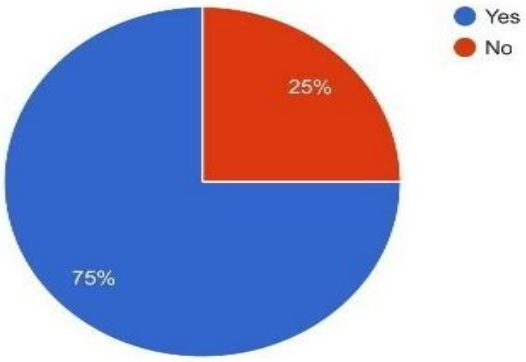

Figure 4. The percentage of people who think that more people should know about the dangers of speeding.

Driving in adverse weather conditions is a common concern, with over 93.3% of individuals feeling unsafe under such circumstances, as shown in Figure 5.

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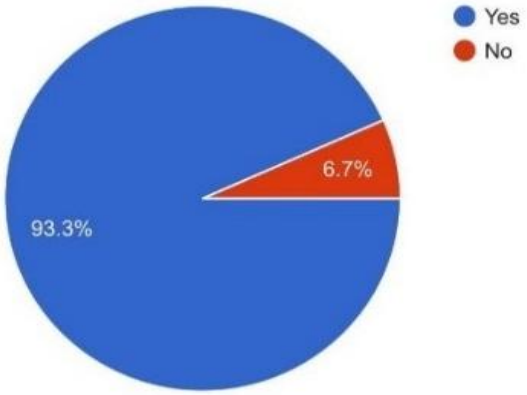

Figure 5. The percentage of people who drove in adverse weather conditions.

Figure 6 shows the 93.8% who believe that stricter penalties for traffic violations would effectively deter risky behaviour.

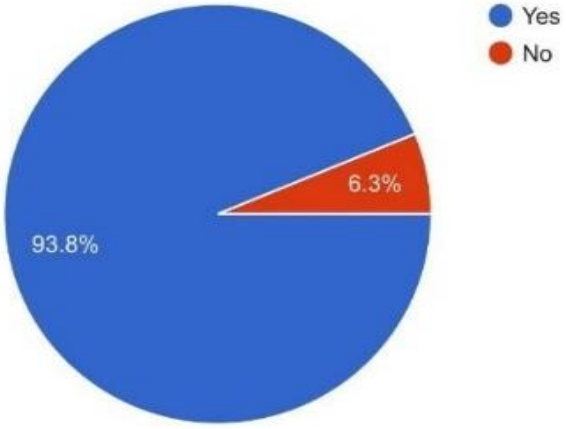

Figure 6. The percentage of people who believe in stricter penalties for traffic violations.

As seen in Figure 7, a sizable majority, 81.3%, believe that the public has adequate access to information about road safety.

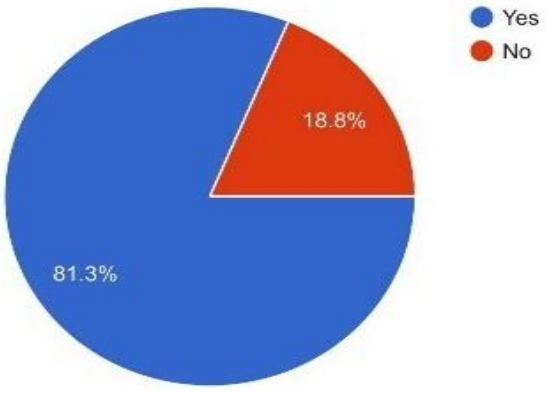

Figure 7. The percentage of people who think the public has sufficient access to information about road safety.

According to Figure 8, 87.5% of people have seen a traffic accident and think that bad road conditions play a role in them.

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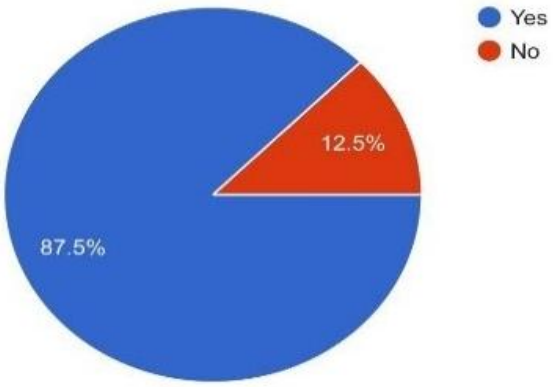

Figure 8. Shows the proportion of respondents who believe poor road conditions contribute to traffic accidents.

Figure nine shows that 93.8% of respondents have personally been in a traffic accident, and all of them concur that careless driving is a major contributing factor to traffic accidents.

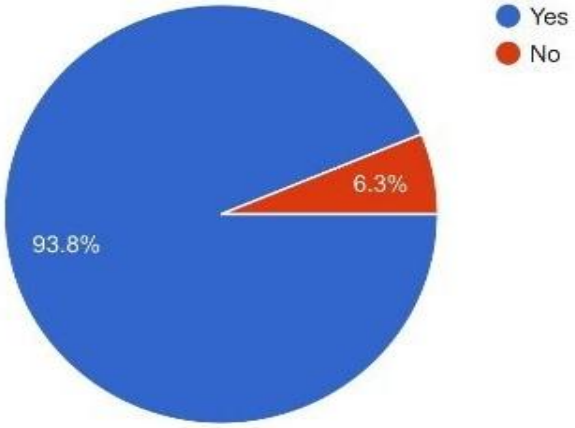

Figure 9. The proportion of respondents who have personally been in a traffic accident.

Additionally, Figure 10 shows that 81.3% of the population knows specific traffic laws addressing road safety in Jordan.

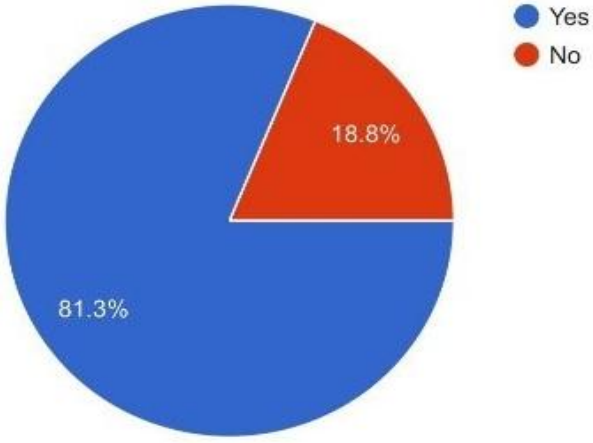

Figure 10. The proportion of people who are aware of particular traffic laws.

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Figure 11 shows that 87.5% agreed that inadequate traffic signage contributes to accidents an also think vehicle technical issues are a common cause of accidents.

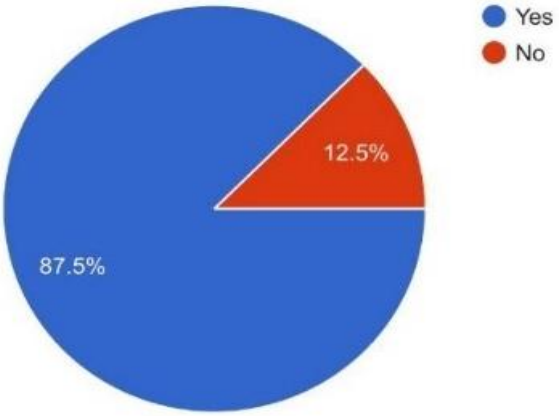

Figure 11. The proportion of people who agreed that inadequate traffic signage and technical issues contribute to accidents.

Figure 12 shows that Awareness of traffic accident hotspots is high, with 81.3% familiar with these areas.

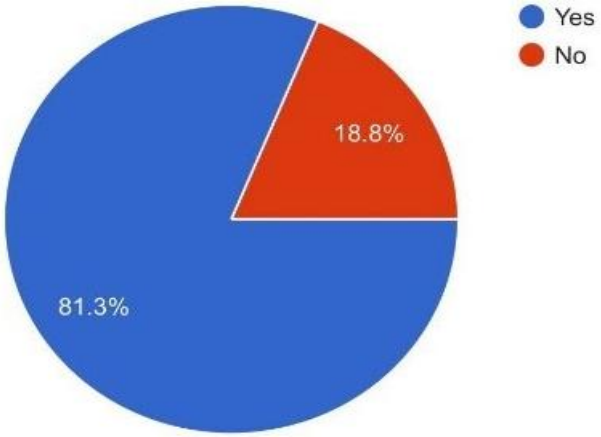

Figure 12. Proportion of people familiar with traffic accident hotspots in their local area.

Figure 13 shows that 93.8% have changed their route due to road safety concerns.

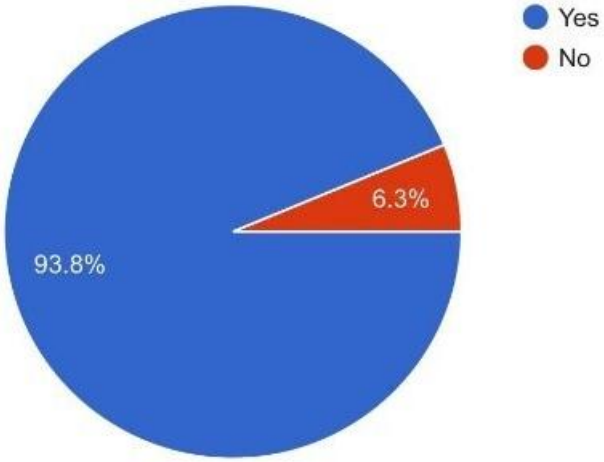

Figure 13. The percentage of people who rerouted because of road safety issues.

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According to Figure 14, individuals reported being personally involved in traffic accidents 89.3% of the time and reported by themselves.

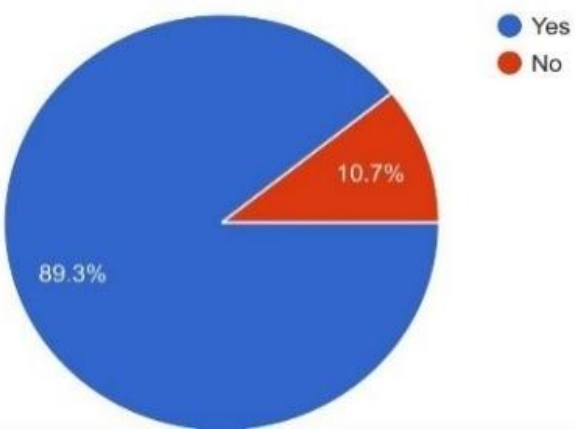

Figure 14. Percentage of personal involvement in traffic accidents, and reported by themselves.

Figure 15 shows that driver education programs are seen as effective in preventing traffic accidents by 85.7% of respondents.

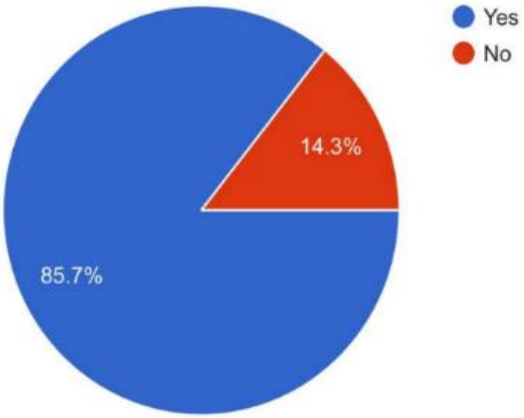

Figure 15. Percentage of respondents who see the effectiveness of driver education programs.

Figure 16 shows that 92.9% agreed they have observed instances of aggressive driving behavior on Jordanian roads.

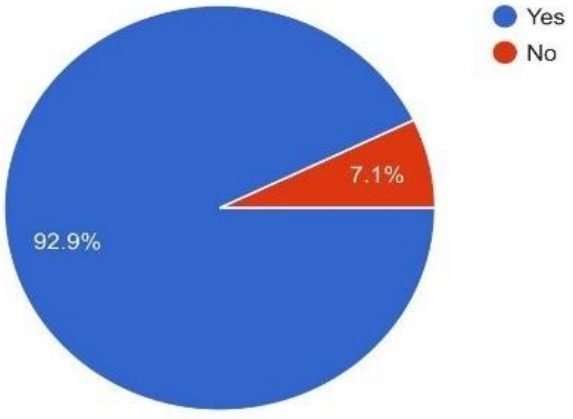

Figure 16. Percentage of respondents who have observed aggressive driving behavior.

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According to Figure 17, 92.9% of respondents think that weariness plays a role in accidents.

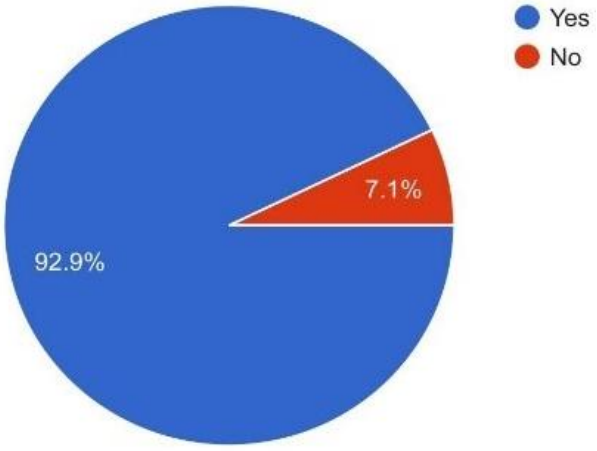

Figure 17. The proportion of respondents who think that weariness plays a role in accidents

According to Figure 18, Hands-free device usage while driving is reported by 78.6%.

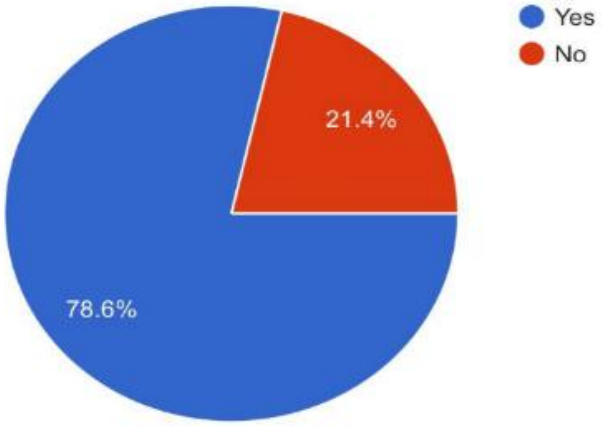

Figure 18. The proportion of respondents who use a hands-free device while driving.

Figure 19 shows that 82.1% of respondents believe that traffic laws are applied consistently throughout Jordan.

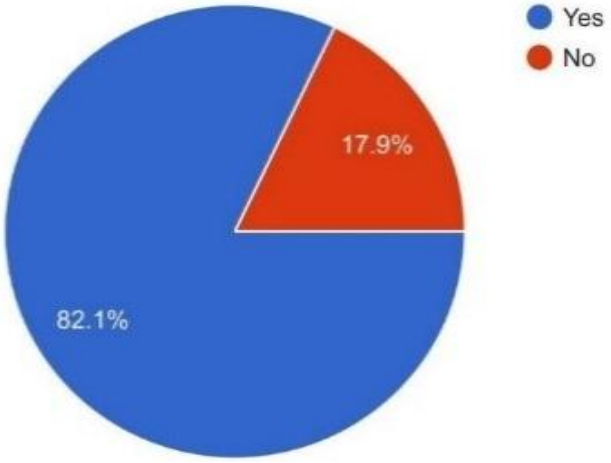

Figure 19. Jordan's consistent perception of traffic law enforcement.

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According to the information shown in Figure 20, a significant majority of respondents said they had witnessed hit-and-run incidents. In particular, the graph shows that more than three-quarters of the participants, or 76.9%, have firsthand experience of at least one hit-and-run. This high proportion highlights how common these occurrences are in the survey respondents' experiences.

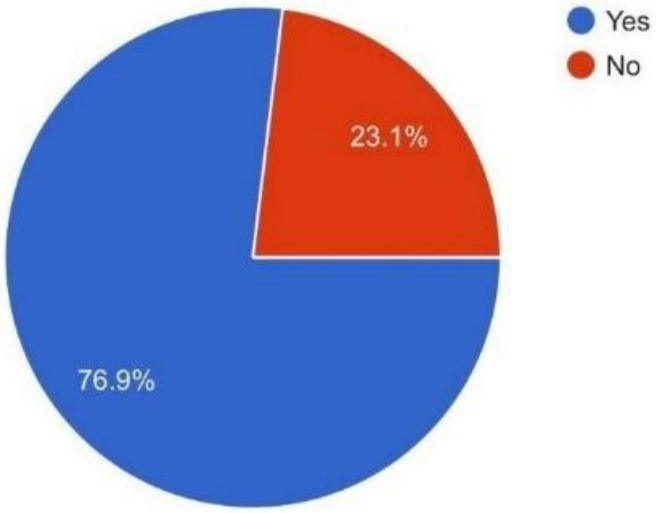

Figure 20. Percentage of respondents witnessed hit-and-runs.

Based on the data in Figure 21, a sizable majority of respondents strongly believed that road maintenance and repair activities have an impact on traffic safety overall. In particular, the graphic shows that 71.4% of respondents believe that road maintenance and repairs directly affect the safety conditions for people using the roads, highlighting a widespread belief that there is a direct correlation between road maintenance and lower risks for drivers, cyclists, and pedestrians on the roads.

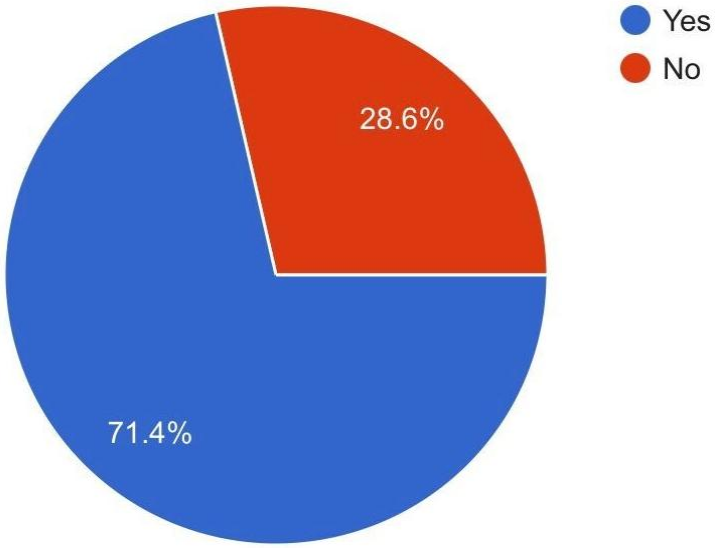

Figure 21. Road maintenance affects traffic safety (agree).

The experiences of pedestrians with traffic safety were surveyed. The degree of agreement among respondents about how safe they felt walking about traffic conditions is shown in Figure 22.a significant 89.3% of participants said they

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had ever felt unsafe while walking because of the state of the traffic. This high proportion highlights how common pedestrian safety issues are due to the design of traffic environments.

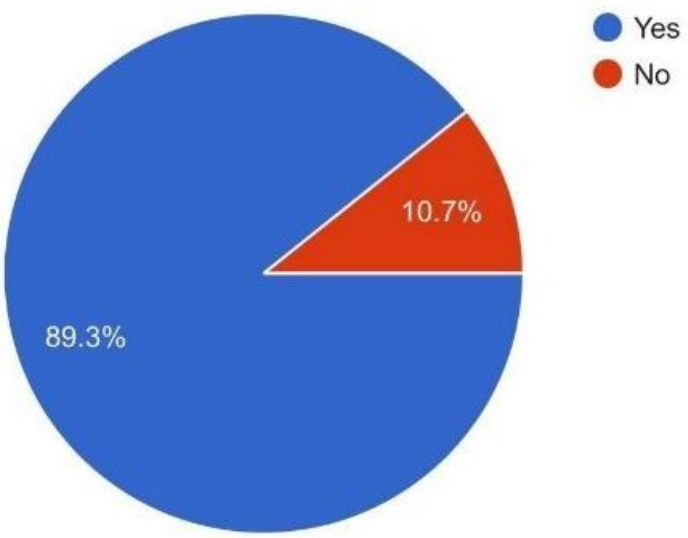

Figure 22. Agreement of pedestrians due to unsafe traffic conditions in Jordan.

Figure 23. A significant portion of the population, 96.4%, believes that the availability of alternatives to private transportation helps to significantly lower the number of traffic accidents. This high percentage indicates that people strongly believe that having readily available transportation options, such as buses, trains, and subways, deters people from using private vehicles, which is thought to result in a significant decrease in the number of traffic accidents that occur.

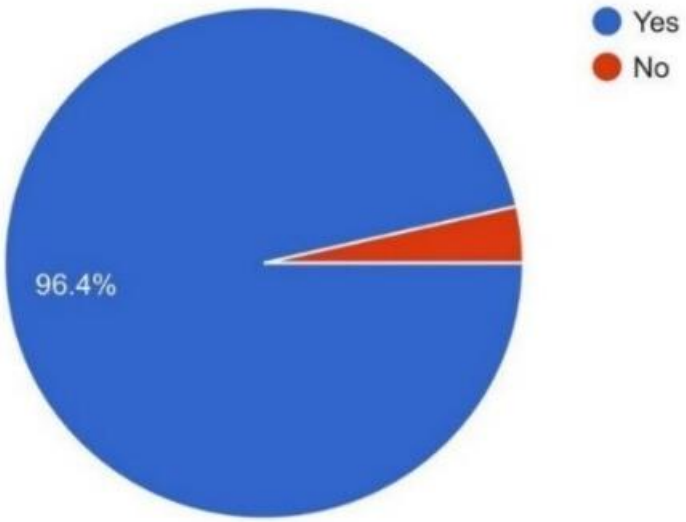

Figure 23. Supports the reduction of public transport accidents.

A sizable majority of respondents, 61 percent, reported having first-hand experience with traffic accidents, as shown in the data in Figure 24. According to the participants' reports, the accidents were directly caused by the bad visibility that existed at the time of the incident. This implies that poor visibility was a significant contributing factor to the traffic accidents that more than three-fifths of the respondents encountered.

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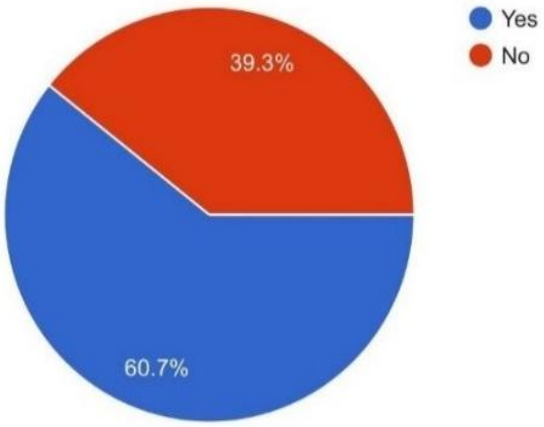

Figure 24. Percentage of the public involved in accidents due to poor visibility conditions.

Figure 25 shows 96.4% of respondents, a very significant majority, said they thought that in-car technology use caused driver distraction, which in turn contributed to traffic accidents. This incredibly high percentage highlights the general apprehension about the possible risks of using these devices while operating a motor vehicle.

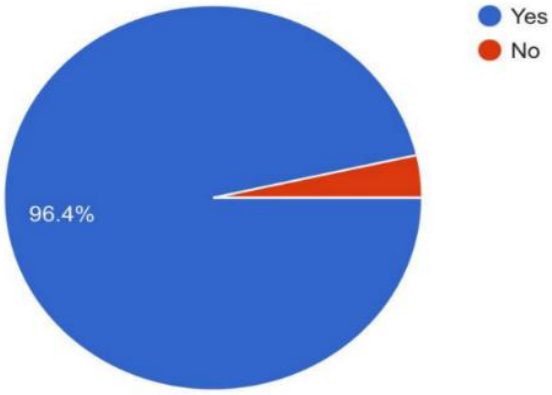

Figure 25. Views of the public regarding the contribution of distracted driving to collisions.

A sizable portion of respondents reported being involved in traffic accidents at intersections, as shown by the data in Figure 26. In particular, the figure shows that 71.4% of respondents, a very high percentage, confirmed that they had been in a traffic accident at some point during their driving career inside an intersection. Given this high percentage, intersections may be especially dangerous places for drivers.

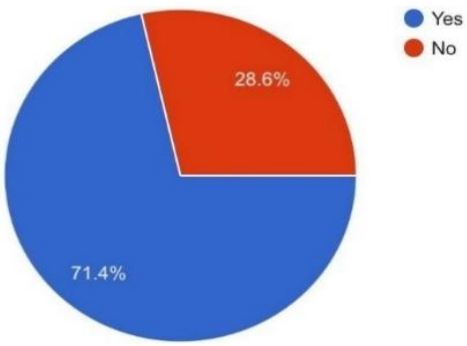

Figure 26. The percentage of drivers who are involved in an intersection traffic accident.

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There is broad agreement about the connection between road lighting and accident rates, as shown in Figure 27. In particular, the data shown in the figure shows that every respondent, or 100% of the population surveyed, thinks there is a measurable relationship between the quantity and calibre of road lighting and the frequency of accidents. This demonstrates the widespread and strong belief that proper road lighting is essential to road safety and preventing accidents.

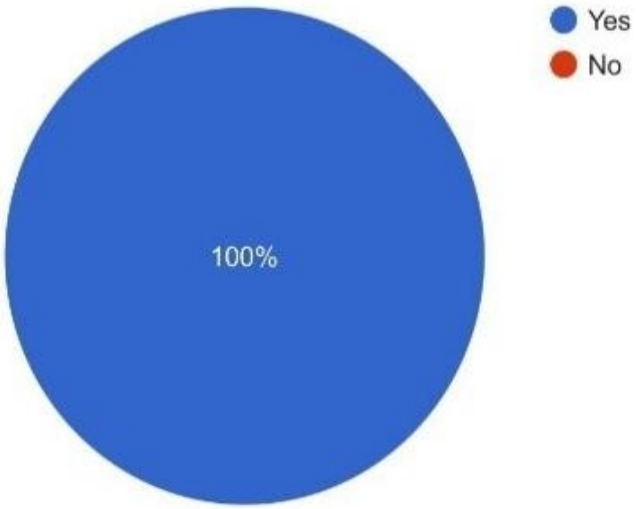

Figure 27. The effect of road lighting and the occurrence of accidents.

Based on the data presented in Figure 28, a significant proportion of respondents have reported issues related to road safety to their local authorities. Specifically, the figure illustrates that nearly three-quarters of the respondents, accounting for 74.1%, indicated that they had formally communicated a road safety concern to the relevant local governing bodies in Jordan. This high percentage suggests that road safety is a salient issue for many individuals residing in the country.

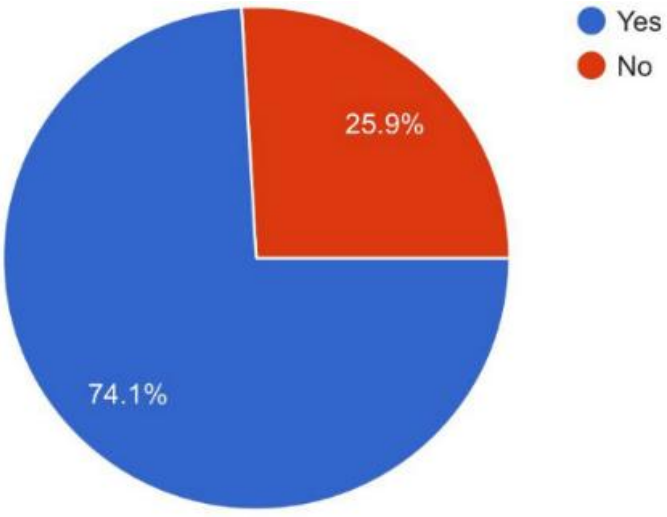

Figure 28. Percentage of respondents reporting road safety concerns.

Based on the data presented in Figure 29, a significant majority of respondents hold the view that road safety regulations are successfully conveyed to the general population. A considerable proportion, precisely 78.6%, express confidence in the effectiveness of communication surrounding road safety rules and guidelines intended for public awareness. This indicates a strong perception among those surveyed that efforts to inform the public about road safety regulations are largely successful.

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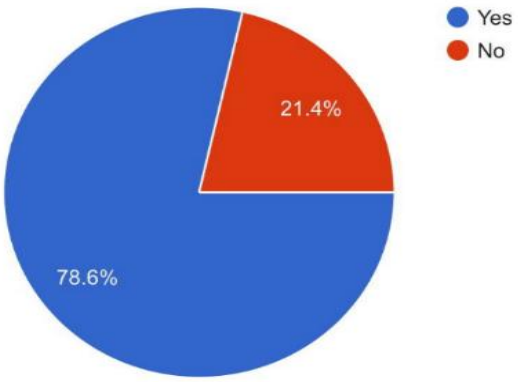

Figure 29. Percentage of agreeing that road safety regulations are effectively communicated.

According to the data shown in Figure 30, all respondents (100%) reported having seen a driver in Jordan ignore or disobey traffic signals or road signs. This total saturation demonstrates how common these traffic infractions are.

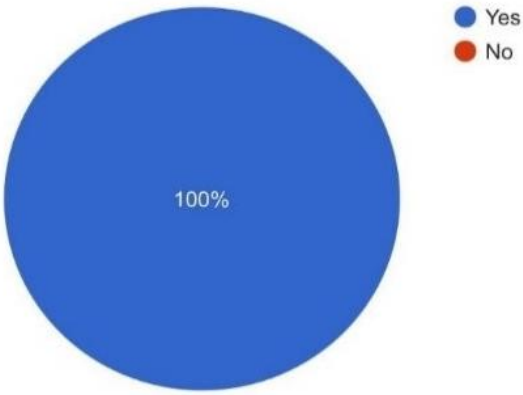

Figure. 30. 100% saw drivers ignore signs/signals.

A sizable majority of respondents have a favourable opinion of the efficacy of traffic calming measures in residential areas, according to the data shown in Figure 31. More precisely, roughly 75% of the respondents, or three-quarters of the total, said they thought these measures were being successfully implemented in residential neighbourhoods. This implies that a sizable segment of the populace believes that these traffic-calming measures are accomplishing their goal of making residential areas safer and liveable.

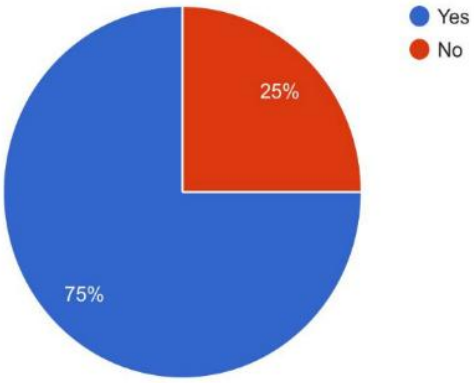

Figure 31. The percentage of respondents who felt that traffic-calming measures in residential areas were effective.

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According to the data shown in Figure 32, a sizable majority of respondents said that they frequently avoid specific roads due to safety concerns. More precisely, the findings indicate that roughly 89.3% of survey respondents think that avoiding particular routes out of fear for one's safety is a common and generally accepted practice. Consequently, the overwhelming sentiment gleaned from the survey data indicates that a significant portion of people believe that avoiding roads that are deemed unsafe is a common tactic.

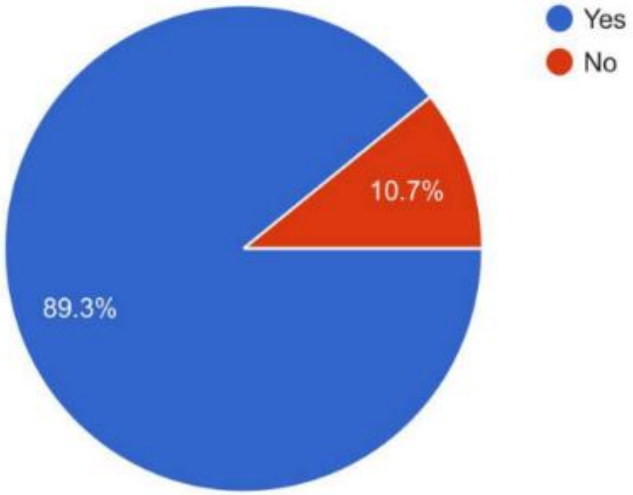

Figure 32. The proportion of respondents who avoid roads because they are unsafe.

Proportion of respondents to surveys or observations who think that road infrastructure development and strategic planning have a big impact on traffic safety overall. To put it another way, we are looking to determine that, according to the data in Figure 33, 89.3% of respondents believe that road infrastructure planning influences, either favourably or unfavourably, the degree of safety that road users experience and the overall flow of traffic.

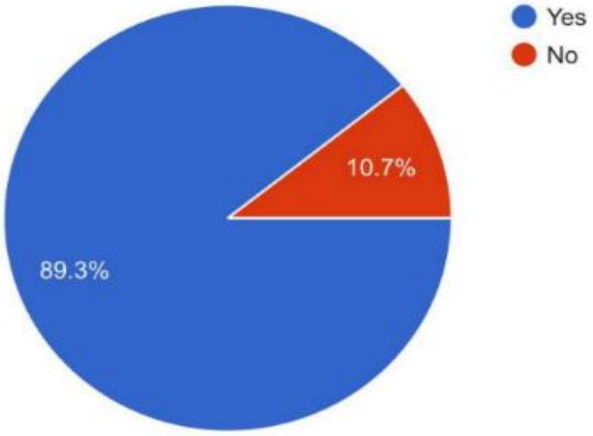

Figure 33. Shows the proportion of people who think that road infrastructure planning has an impact.

Figure 34 shows that 93.8% of respondents believe that public transportation is also a concern, as more than eight out of ten respondents have witnessed public transport vehicle accidents.

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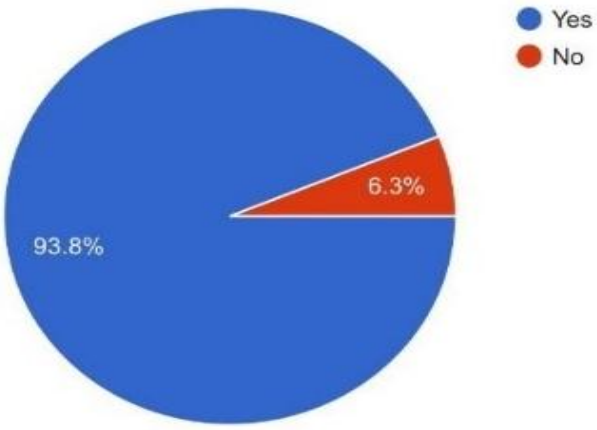

Figure 34. Illustrates the percentage of respondents who believe that public transportation is a significant concern.

CONCLUSIONS

According to a study on traffic accidents in Jordan, increasing road safety requires a multipronged strategy. Important points consist of:

- Enforcing traffic laws effectively is critical.
- The public views road lighting, harsher penalties, driver education, and infrastructure upgrades as being crucial.
- Distracted driving, careless driving, bad road conditions, insufficient signage, and bad weather are common contributing factors.
- Accidents can be greatly decreased by raising public awareness, providing more transportation options, and encouraging the use of technology.
- Recommendations favor better enforcement, infrastructure, data, community help, and safety tech.
- By taking into account the local context and societal attitudes, the research seeks to inform evidence-based policies that will improve safety and reduce accident rates in Jordan.

RECOMMENDATIONS

- Boost enforcement on risky driving.
- Increase penalties for moving violations.
- Run awareness campaigns via social media, etc.
- Improve pedestrian infrastructure, signage, and lighting.
- Regularly assess and maintain roads.
- Use technology: cameras, smart signals, and tracking.
- Promote traffic apps.
- Expand driver education on fatigue and safe driving.
- Promote public transport.
- Create a centralized accident/safety database; analyze data for policy.

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- Collaborate with academia and communities.
- Implement driver reward programs.
- Upgrade pedestrian safety protocols.
- Constantly assess infrastructure/measure efficacy.
- Support long-term research on policy impacts.
- Implementing these improves road safety, lowers accidents, and saves lives.
- To reach an audience, use social media/gatherings.

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