

Analyzed the Causes and Effects of Road Traffic Accidents in Libya: Case Study Bani Walid

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تحليل أسباب وآثار حوادث المرور في ليبيا: دراسة حالة بني وليد

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Received: 13-11-2025	Accepted: 22-12-2025	Published: 01-03-2026
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المخلص

يعتبر الكثير من الناس وسائل النقل أمراً مسلماً به، لكنها في الواقع تتيح التفاعل الاجتماعي والسياسي الضروري لتحقيق النمو الاقتصادي. وليبيا ليست بمنأى عن الاتجاه العالمي المتزايد في عدد حوادث المرور خلال السنوات الأخيرة. لذلك، فإن العدد الإجمالي للحوادث القاتلة وعدد الوفيات في المدن يشهدان ارتفاعاً مستمراً مع مرور الوقت. يركز هذا التقرير على حوادث المرور على طريق بني وليد – طرابلس، حيث يتناول أسباب وقوع هذه الحوادث ويقترح حلولاً شاملة للحد منها. وتؤكد النتائج ما توصلت إليه دراسات أخرى، وهو وجود نقص في المبادرات التوعوية المتعلقة بسلامة الطرق.

كما تشير الدراسة إلى أن وجود مركبات كبيرة الحجم على الطرق، إذا لم يتم التعامل معها بحذر، قد يسبب مشكلات تتعلق بالرؤية وسهولة الحركة، مما يزيد من احتمالية وقوع الحوادث. بالإضافة إلى ذلك، أفاد 7% من المشاركين في الاستبيان بأن نقص كفاءة السائقين يُعد عاملاً مساهماً في الحوادث، مما يبرز أهمية تأهيل السائقين وتوفير التدريب المناسب لتعزيز ممارسات القيادة الآمنة والمسؤولة.

ومن الضروري التعامل مع مشكلة حوادث المرور في طريق بني وليد – طرابلس بشكل عاجل إذا كنا جادين في تقليل عدد الوفيات غير الضرورية والحد من الآثار الصحية والاجتماعية والاقتصادية السلبية المرتبطة بها.

الكلمات الدالة: الاستبيان، حوادث الطرق، تحليل باستخدام برنامج SPSS

Abstract

Many people take transportation for granted, but it really allows for the social and political interchange that is essential to economic growth. Libya is not immune to the worldwide trend of an increase in the number of traffic accidents in recent times. Therefore, the overall number of fatal accidents and the number of deaths in the city have both been steadily rising over the years. Bani Walid Tripoli road traffic accidents are the subject of this report's investigation. The text delves into the reasons behind accidents and offers comprehensive ways to avoid them. This confirms what other studies have shown: that there is a lack of initiatives to teach people about road safety. Similarly, if not handled carefully, the presence of very big cars on the road could cause problems with visibility and practicality, which could lead to accidents. In addition, seven percent of people who took the survey said that drivers' lack of competence was a contributing factor in accidents. This emphasizes the significance of qualified drivers who have received adequate driver education in promoting safe and responsible driving practices. It is imperative that we address the problem of road traffic accidents in Bani Walid Tripoli immediately if we are serious about reducing the number of needless deaths and the associated negative health, social, and economic impacts.

Keywords: Questionnaire. Road Accidents. SPSS Analysis.

Introduction

1. Introduction

Road accidents have been thoroughly investigated and are of particular relevance among numerous factors. Transport incidents are becoming more prevalent as the frequency of transportation continues to rise.. [1, 2]. The findings from multiple reviews have been provided, addressing the road safety aspects related to intelligent transport systems applications [3]. Road accidents constitute the primary cause of mortality for men aged 44 and under. The principal, persistent variables leading to road accidents include disobedience with traffic laws, weak driving abilities combined with poor evaluation of road conditions, deficient road infrastructure, and inadequate vehicle maintenance [4]. The increase in per capita income, coupled with affordable petrol prices, has resulted in a significant rise in vehicle ownership among individuals in Tripoli, Libya [5]. In 2010, roughly 2,375 individuals perished and 14,025 sustained injuries due to road traffic incidents in Libya. The daily occurrence of road traffic deaths is increasing, with the highest rates noted in Arab nations with populations not exceeding 6.5 million [6]. The global annual road traffic fatalities have consistently risen, reaching an alarming 1.35 million. In recent years, the incidence of road traffic fatalities relative to the global population has stabilized. Notably, 93% of global traffic fatalities transpire in low- and middle-income countries [7]. Remarkably, these nations comprise over 60% of the global total of autos [8]. Consequently, the data reveals that the increasing incidence of road accidents is a predominant concern for all countries [9]. Conversely, road traffic accidents are becoming acknowledged as a significant public health concern, resulting in substantial human resource losses and considerable socioeconomic consequences globally [10]. Road safety has consistently been a topic of utmost importance in scientific research. Research has thoroughly examined numerous facets, with road accidents being notably significant [11]. Therefore, these tragedies significantly affect the social fabric, leading to fatalities or lifelong disability for many individuals [12]. In the same way, it is universally acknowledged that driving under the influence of alcohol markedly increases the probability of an accident [13]. This important study has revealed significant insights into the harmful effects of alcohol consumption on driving skills and the associated risks to road safety [14]. Absolutely, you are right. The Grand Rapids study did not include a meta-analysis. Instead, it showcased the results of a small selection of individual studies and concluded that there was inadequate evidence to substantiate the idea that the use of cannabis alone heightened the chances of being deemed responsible for a road accident [15]. The study primarily focused on the impairment caused by alcohol and its effects on accident culpability [16]. Road traffic injuries result in the deaths of more than 3,000 individuals globally each day, rendering road safety a critical public health issue [17]. This troubling reality underscores the pressing necessity for extensive efforts to tackle and alleviate the catastrophic effects of vehicle accidents worldwide.

Prioritizing efforts to improve road safety is essential for safeguarding the lives and welfare of individuals in our communities [18].

Furthermore, it is important to point out that traffic accidents result in significant economic losses worldwide. Estimates indicate that the annual cost of road traffic injuries reaches an astonishing US\$518 billion [19]. The economic consequences highlight the extensive effects of road accidents, stressing the necessity for comprehensive efforts to safeguard human lives and reduce the economic burden on countries globally. Addressing road safety issues is not merely a public health problem but also a crucial element of sustainable economic development [20]. Numerous studies have concluded that motor vehicle speed and traffic volume significantly contribute to the risk and severity of collisions involving cyclists or pedestrians [21]. Increased vehicle velocities diminish the reaction time for both motorists and vulnerable road users, complicating collision avoidance. Moreover, heightened traffic volume may result in congestion and diminished visibility, thus exacerbating the likelihood and severity of collisions. It is imperative to prioritize initiatives that mitigate these issues to improve the safety of bicycles and pedestrians on our roadways [22].

Recently, traffic accidents have become a significant global concern, ranking as the ninth largest cause of death worldwide. The increasing incidence of vehicle accidents annually has become a significant issue for Libya. Consequently, academics have increasingly concentrated on analyzing road accidents to discern the characteristics that significantly influence their incidence [23]. These incidents are influenced by various causes that are contingent upon multiple variables, including the lack of priority given to pedestrians and vehicles [24, 25]. Numerous research studies on road accidents have found several contributing elements in these incidences. This encompasses environmental factors, motorway design, accident types, driver characteristics, and car attribute studies [26]. Likewise, the reduction of accidents and the guarantee of road safety are significant priorities for public health. This assertion is substantiated by statistical data indicating that over 3,000 individuals globally perish daily due to road traffic incidents [27]. Currently, road safety has emerged as a critical concern owing to the escalating frequency of road accidents [28]. Therefore, there is an urgent necessity to analyze accident severity and the contributing elements. This study aims to examine the factors influencing accident severity, with a specific focus on differentiating between various types of accidents [29].

Therefore, there is an urgent necessity to analyze accident severity and the contributing elements. This study aims to examine the factors influencing accident severity, specifically distinguishing between different types of accidents [30]. The predominant body of research examines the diverse causes that lead to road accidents, aiming to reduce both their occurrence and severity. By comprehending and tackling these elements, initiatives can be focused on diminishing the incidence of accidents and their consequential effects [29]. In general, the severity of road accidents can be assessed based on the human fatalities and injuries incurred. Through a comprehensive review of the existing literature, numerous studies have been identified that delve into the factors influencing accident severity [31]. However, road safety has long been a topic of utmost importance in scientific research. Moreover, traffic accidents present notable economic difficulties, since considerable costs are accrued for paying for harm to both property and humans [32]. Therefore, it may be argued that road and a wide range of variables, including both identifiable and unidentified causes, affects traffic accidents. Certain variables may possess a greater level of complexity and intricacy, necessitating a more thorough investigation in order to properly grasp their influence on the frequency of accidents [33]. From a different viewpoint, a traffic accident can be described as an unforeseen and unintentional event occurring on a road involving automobiles, with or without the involvement of other road users, leading to injuries or damage to property [34]. Without a doubt, drowsiness has a substantial influence on the safety of driving. There is a widely held belief that around twenty percent of all automobile accidents can be ascribed to drowsiness. Driving when tired can have severe repercussions, as it impairs cognitive skills and reduces awareness, significantly raising the risk of accidents. Understanding the significant impact of sleepiness on road accidents is essential for creating successful approaches to enhance driver alertness, promote adequate rest, and eventually reduce the dangers associated with driving when fatigued [35]. Consequently, inadequately addressing the issue of road accidents in Libya will yield dire repercussions for the safety of Libyan society. The integration of traffic accident forecasting and management techniques with expert system technology provides an invaluable foundation that allows engineers, students, and decision-makers to implement and employ traffic accident prediction and control tactics.

Methodology

The main goal was to ascertain the determinants affecting mode choice and to formulate strategies for data collection, research region selection, sampling design, and analysis and interpretation of the results. This article employed an online questionnaire as a methodological tool for data collecting. The questionnaire was carefully designed to meet all research objectives and obtain a thorough grasp of potential recommendations for addressing the issues identified in the study's problem statement. The data was examined utilizing SPSS software.

Data analysis

Statistical approaches for quantitative data analysis. The data analysis utilized SPSS version 29, the Statistical Package for the Social Sciences. Statistical analysis software, like SPSS, is crucial in accident analysis for data collection and processing. SPSS provides a robust platform for organizing, managing, and analyzing accident-related data, facilitating a comprehensive understanding of the various factors and variables involved. The data collection method often involves acquiring relevant information pertaining to the accidents under investigation. This may include specific details such as the exact location and time of the accident, the types of vehicles involved the prevailing weather conditions, the severity of the injuries sustained, and any factors that may have contributed to the incident, such as driver behavior or road conditions.

Results and Discussion

Figure 1 indicates that survey participants recognized several primary variables contributing to accidents on the Bani Walid-Tripoli road. 46% of participants attributed accidents to "excessive speed and impatience while overtaking, especially during turns," identifying it as the principal contributing factor. This underscores the significance of driver behavior, especially excessive speed and perilous overtaking, in causing traffic accidents. Moreover, 34% of interviewees identified "road condition" as a significant factor in accidents. The findings suggest that road conditions and unexpected obstacles, such as camels, may pose risks and increase the likelihood of accidents. The study also indicates that 11% of participants identified "heavy transport vehicles" as a contributing factor in accidents. Furthermore, 9% of participants reported that accidents resulted from the drivers' inadequate skill and experience. This highlights the importance of driver training and proficiency in ensuring safe and responsible driving practices. The importance of road infrastructure and the presence of unexpected obstacles, such as camels, are regarded as essential factors. To address these issues, the implementation of targeted interventions, driver education programs, and the fortification of road infrastructure can significantly reduce the probability of accidents and improve overall road safety on this particular rout [36].

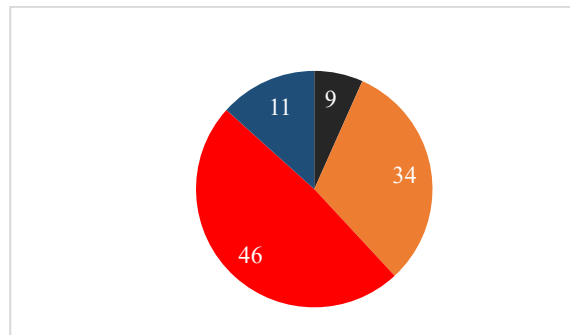


Fig 1: Major Causes of Bani Walid-Tripoli Road Accidents

Figure 2 depicts the spectrum of respondents' perspectives about the assertion: "Speed is the principal factor contributing to road accidents." This distribution provides a stimulating viewpoint. Only a small proportion of 12% agrees with this argument, while the vast majority of 88% disagrees. This discovery refutes the prevalent notion that speed alone is the primary factor leading to accidents. It aligns with prior research indicating that accident causation is intricate and involves numerous elements. While speed may contribute to accidents, the findings indicate that factors such as driver behavior, road conditions, and vehicle maintenance are likely to exert a more significant influence on road incidents. To reduce accident frequency and protect the well-being of all road users, it is essential to address the factors identified by respondents and implement targeted interventions [37].

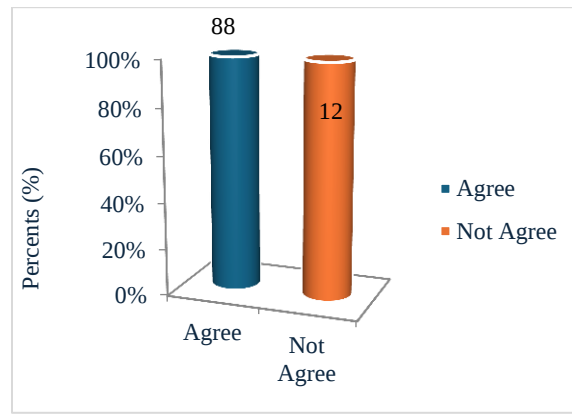


Figure 2: The Principal Factor Contributing to Road Accidents

Figure 3 demonstrates a comparatively low level of endorsement among respondents for mandating the instruction of a scientific curriculum on road etiquette and traffic regulations for children. The statistics indicate that 91% of individuals vehemently oppose this concept, while only 9% endorse it. This conclusion aligns with previous studies indicating a lack of emphasis on road safety instruction. The absence of support for a formal educational program in this domain may contribute to the observed disregard for safety regulations on the roads, as evidenced by the low rates of seatbelt usage and the tendency to speed, as suggested by prior studies. This study indicates a necessity for heightened emphasis on road safety instruction, beginning in early developmental stages. By disseminating knowledge and fostering awareness of road etiquette and traffic regulations among students, we can build a culture of responsible road usage. This can diminish the frequency of accidents and promote safer, more responsible conduct on the roadways. Implementing a scientific curriculum on road safety for children can equip them with the necessary knowledge, skills to become educated, and responsible road users. By educating individuals on the importance of obeying traffic laws, exhibiting proper road conduct, and practicing safe behaviors, we can effectively reduce the risks associated with road accidents. Incorporating road safety teaching into the school curriculum is essential. By providing comprehensive and age-appropriate education on road safety, we may foster a group of informed and responsible drivers, walkers, and cyclists who prioritize safety when traversing the streets [38].

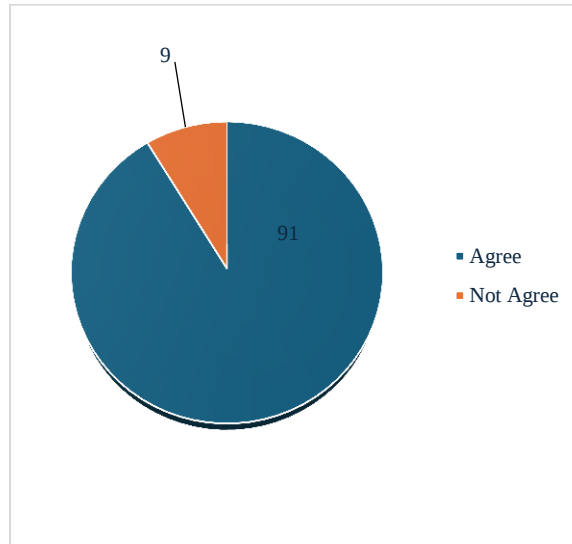


Fig 3: Road Etiquette and Traffic Laws

Figure 4 illustrates a pie chart representing the gender distribution of participants in a study or survey. The data indicates that the majority of participants (93%) are male, while a minority (7%) are female. The gender distribution in the sample is markedly imbalanced, potentially affecting the ability to generalize the results to a broader population. The restriction on women driving vehicles in Bani Walid can be ascribed to its customs and traditions.

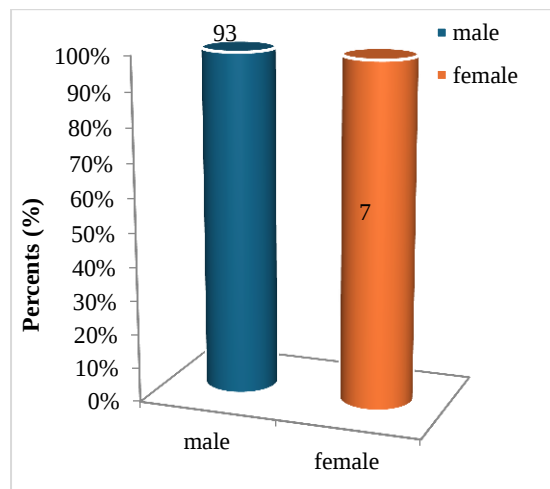


Fig 4: The Gender Distribution

A plurality of participants, accounting for 34%, are aged between 20 and 30 years. Additionally, a comparable percentage of participants, constituting 32%, are within the age bracket of 30-40 years. Figure 5 depicts the allocation of the remaining participants across various age categories. The remaining competitors are categorized into three younger age groups: 23% are aged between 40 and 50, 8% are 50 years or older, and a modest 3% are under 20 years of age.

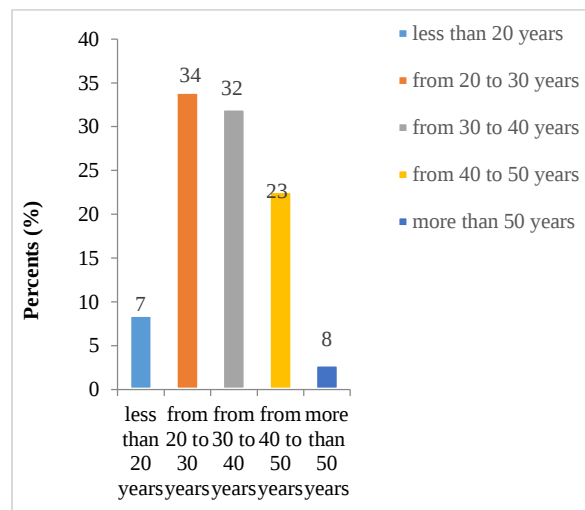


Fig 5: Age Distribution

Figure 6 illustrates a bar chart representing the frequency of road utilization reported by the respondents. The findings reveal that a substantial majority, including 65% of the participants, frequent the road numerous times each month, indicating a regular presence on it. Subsequently, 30% of participants reported utilizing the road multiple times each week, suggesting a relatively diminished frequency of road utilization. Merely 5% indicated that they utilize the road daily. This data indicates that most responders have a consistent presence on the road, albeit not necessarily on a daily basis. Linking this data to previous studies on the inadequate use of seatbelts across various demographic groups indicates that increased road usage amplifies the risk of experiencing greater threats when seatbelts are not utilized. The heightened presence of individuals on the road immediately correlates with an increased probability of accidents, underscoring the critical necessity of constantly utilizing seatbelts.

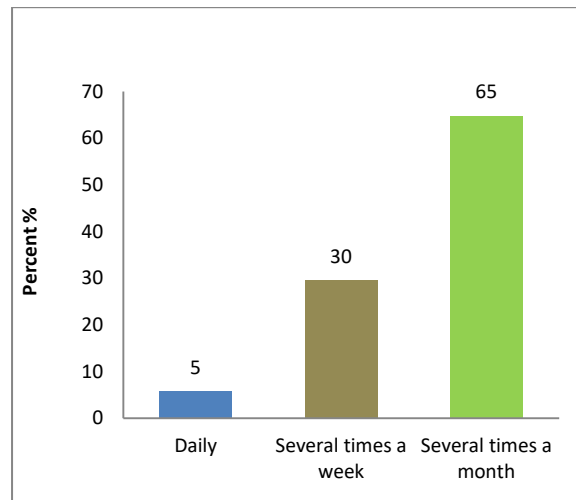


Fig 6: Road Usage Frequency Reported by Respondents

Figure 7 displays a bar chart depicting the distribution of self-reported driving speeds among participants. The data unequivocally demonstrates that the predominant speed range reported by participants is 120-140 km/h, representing 45% of the respondents. Subsequently, 39% of participants reported driving at speeds between 100 and 120 km/h. A minority of participants, comprising 4%, reported driving at speeds under 100 km/h, whereas 12% indicated driving at speeds over 140 km/h. These findings align with previous studies indicating a significant number of drivers' preference for increased driving speeds. This pattern persists despite the respondents possessing a significant level of education and awareness concerning road safety issues. This suggests that speeding behavior may be affected by factors beyond knowledge and awareness, including risk perception, personal driving habits, and the effectiveness of speed limit enforcement. Further investigation is necessary to thoroughly understand the complex interplay of several factors influencing speeding behavior. This will facilitate the development of effective treatments that promote safer driving behaviors and address the underlying reasons for prevalent excessive driving speeds. By identifying and addressing these elements, it is possible to work towards creating a safer road environment for all road users.

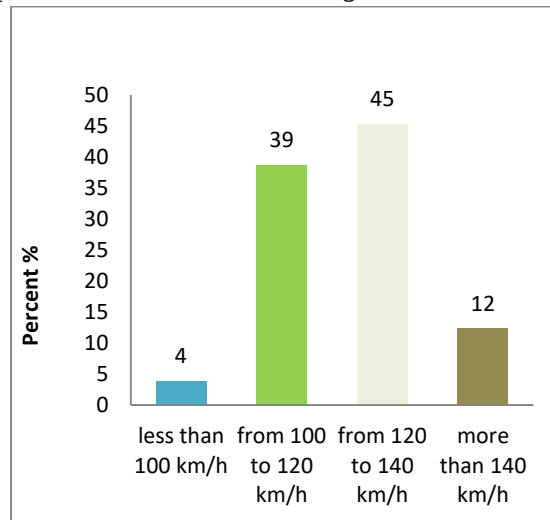


Fig 7: Driving Speeds Reported by Survey Participants

Conclusion

Despite limited data regarding public sentiment on legislation restricting desert animal ownership, this conclusion aligns with extensive research on public perceptions of road safety concerns. Research consistently shows that most of the people supports the implementation of stricter legislation and enforcement tactics aimed at reducing traffic accidents. For instance:

Most participants indicated a preference for harsher penalties for traffic violations, particularly those related to animal management [39]. Huijser, M., et al. discovered that animal-vehicle collisions are a primary source of accidents and fatalities in some locales, with camels posing a notably substantial risk in arid locations [40]. St. Clair, C.C., et al. underscored the necessity for effective strategies to regulate animal movements in proximity to roadways to improve road safety. Studies on prevalent attitudes on animal welfare have indicated a growing concern for the wellbeing of animals, including those impacted by accidents [41].

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