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The Impact of human factors on road traffic fatalities within Musina Local Municipality: An analysis of critical elements

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Abstract: Sustainable transport is essential to achieving most of the goals in the 2030 Agenda for Sustainable Development. Although not represented by a dedicated sustainable development goal, sustainable transport is mainstreamed across several goals and targets, especially those related to food security, health, energy, infrastructure and cities, and human settlements. Thus, the development of different transportation systems, especially land transportation, has contributed to the mobility, accessibility, and development of societies. Great economic and technological benefits are derived from this flow of goods and people. However, at the same time and together with all the benefits derived from it, the most pernicious aspects appear, such as environmental pollution, visual and acoustic intrusion, congestion, and the worsening of habitability in cities, among other elements. Of all these problems, traffic accidents have the greatest social impact. Consequently, this paper deals with the human factor in the field of traffic, mobility, transportation and road safety, and the relationship with other major factors such as roads, environment, signalling, vehicles, and enforcement. Road safety is also an important sustainable development issue as illustrated by its express inclusion in the 2030 Agenda for Sustainable Development, in targets 3.6 - aiming for the reduction of global road traffic deaths and injuries by 50 per cent by 2020; and 11.2 – aiming to provide access to safe, affordable, accessible and sustainable transport systems for all by 2030. The need for improving road safety has been acknowledged by the United Nations (UN) and its Member States for over 60 years, with extensive work being carried out particularly by the UN regional commissions, the World Health Organisation (WHO), and the World Bank. More recently, road safety has been receiving increased international attention, including through the launch of relevant initiatives and activities. This study has explored human factors as critical elements contributing to road traffic fatalities in the Musina Local Municipality. This was done to fill the existing gap in the available literature studies by determining notable problems of road traffic fatalities, which were increasing in the selected study location despite all the efforts made by the local traffic department to implement road safety measures. An exploratory qualitative research method has been used to collect data from 25 participants who were purposively selected. This study establishes that road safety measures were many and they were known by various road users but are not followed. As such, road safety measures have made little contribution towards reducing the problem of road traffic fatalities in the study area. The study finds that there were many and various causative factors related to human behaviour as a critical contributory element of road fatalities, including human, infrastructural, environmental, situational, and mechanical factors. It is recommended that implementing road safety measures should go together with the efforts of clearly understanding the human behaviour of road users. Furthermore, law enforcement interventions and education should be accompanied by public information awareness campaigns to highlight the significance of this practice. This study concludes that the occurrences of road traffic fatalities in the study location could not be explained by the violation of road safety measures alone.

Keywords: Contributing factors, critical elements, human factors, Musina Local Municipality, road traffic fatalities

Introduction

Sustainable transport is essential to achieving most of the goals in the 2030 Agenda for Sustainable Development. Although not represented by a dedicated sustainable development goal, sustainable transport is mainstreamed across several goals and targets, especially those related to food security, health, energy, infrastructure and cities, and human settlements. Thus, the development of different transportation systems, especially land transportation, has contributed to the mobility, accessibility, and development of societies. Great economic and technological benefits are derived from this flow of goods and people. However, at the same time and together with all the benefits derived from it, the most pernicious aspects appear, such as environmental pollution, visual and acoustic intrusion, congestion, and the worsening of habitability in cities, among other elements. Of all these problems, traffic accidents have the greatest social impact. The study of human behaviour has significant interest for road safety specialists due to the inherent tendency of individuals to make errors and engage in violations. Road safety programmes play a crucial role in addressing the issue at hand. In conjunction with other behavioural interventions such as law enforcement, education, training, and to a certain extent, infrastructure, road safety campaigns are employed as a strategy to encourage the public to adopt safer behaviours when navigating roadways. Road safety campaigns can be described as deliberate efforts to educate, convince, and inspire a population (or a subset of a population) to modify their attitudes and/or actions to enhance road safety (Chetty, Mofokeng, Simelane & Khosa, 2023:670). The World Health Organisation [WHO] (2019:3) indicated that several countries have seen success in reducing road traffic deaths over the last few years, but progress varies significantly between the different regions and countries of the world. Further that there seems to be a continuous strong association between the risk of a road traffic death and the income level of countries. With an average rate of 27.5 deaths per 100,000 of the population, the risk of a road traffic death is more than three times higher in low-income countries than in high-income countries, where the average rate is 8.3 deaths per 100,000 of the population. Globally, the International Transport Forum [ITF] (2018: 8), which is an intergovernmental organisation with 59 member countries that organises global dialogue for better transport, provides that in 2015 and 2016, the trend slowed down and even reversed in some countries.

For 2017, a decrease in the number of road deaths was reported by 20 of the 29 member countries of the International Road Traffic Data and Analysis Group (IRTAD) for which preliminary fatality data are available, however, the number of traffic fatalities were reported to remain stable. Only five registered increases of 2% or more in road deaths, compared to 2016. The countries that recorded the largest decrease in 2016 were: Lithuania, the Czech Republic and Switzerland. The overall average is significantly influenced by the United States (US). As the most populous IRTAD member country, the US accounted for nearly half of the absolute number of the group's road deaths in 2016 (ITF, 2018: 8). The report on the Global Plan for the Decade of Action for Road Safety 2011–2020 (2015: 4), indicates that approximately 1.3 million people who are involved in road accidents die because of road traffic accidents, which means that about 3 000 deaths occur daily across the globe. These accidents lead to 20–50 million people living with serious injuries worldwide. It is predicted that, in African context, 20 Africans who die in 2050, will be killed in a traffic accident. What began as a problem in the developed world, now affects most low-income countries in general and African countries in particular (Gicquel et al,2017). This hence motivates the conduct of this study the findings of which are presented in this paper. Section one is the introduction. In section two, the literature on human and other factors that contribute to road fatalities are reviewed. Section three is the methodological section while in section four, the main findings are presented. This paper concludes in section five and makes salient recommendations in the last section.

Problem Statement

Road-related fatalities remain high in South Africa compared to other African nations. Negligent driving (Mmakwena & Adewale, 2023: 423), drunken driving, paved roads and use of seatbelts (Ncube, Cheteni & Sindiyandiya, 2016:627), are some of the determinants of human factors contributing to road related fatalities. The Organisation for Economic Co-operation and Development [OECD] (2016), contends that road motor vehicles incidences are cited the highest, amongst the 60 member countries (it is also reported that reducing these incidences remains the greatest concerns for these countries) of the ITF, which works for transport policies to improve peoples' lives, while fostering a deeper understanding of the role of transport in economic growth, environmental sustainability and social inclusion and to raise the public profile of the transport policy (ITF, 2020). There are challenges between South Africa's Departments of Transport (DoT) and of Basic Education (DBE), non-governmental organisations (NGOs), business organisations, community structures, and tertiary institutions in coordinating efforts aimed at devising and implementing strategies that will reduce and prevent road fatalities. Motorists have the tendency of obeying rules of the road only when they notice the presence of traffic officials. And the lack of visibility of traffic officers on public

roads is a major problem is South Africa. In most cases the issue of lawlessness by the drivers come to the fore, which results in road crashes.

Literature Review

Factors contributing to road accident fatalities

Road safety is also an important sustainable development issue as illustrated by its express inclusion in the 2030 Agenda for Sustainable Development, in targets 3.6 - aiming for the reduction of global road traffic deaths and injuries by 50 per cent by 2020; and 11.2 – aiming to provide access to safe, affordable, accessible and sustainable transport systems for all by 2030 (UN, 2017:10-11). UN (2017:11) asserts that the need for improving road safety has been acknowledged by the UN and its Member States for over 60 years, with extensive work being carried out particularly by the UN regional commissions, the WHO, and the World Bank. More recently, road safety has been receiving increased international attention, including through the launch of relevant initiatives and activities. These include, the launch, in May 2011, in accordance with UN General Assembly resolution 64/255, of the Global Plan for the Decade of Action for Road Safety 2011-2020 (the Global Plan) (WHO, 2011), developed by the UN Road Safety Collaboration (UNRSC), providing an overall framework for activities aimed at stabilising and then reducing the forecast level of road traffic fatalities around the world by 2020; and the appointment in 2015, of the UN Secretary-General's Special Envoy for Road Safety, Jean Todt, working to make road safety a priority worldwide, by helping mobilise sustained political commitment globally. UN General Assembly resolution 70/260 on Improving global road safety, adopted in April 2016, reaffirmed adoption of the targets on road safety, specifically targets 3.6 and 11.2, and acknowledged reducing road traffic deaths and injuries as an urgent development priority. It also endorsed the outcome document of the second Global High-Level Conference on Road Safety, held in November 2015, the Brasilia Declaration on Road Safety. The resolution invited two major development conferences - the UN Conference on Housing and Sustainable Urban Development (Habitat III, Quito, Ecuador, October 2016) and the 9th Global Conference on Health Promotion (Shanghai, China, November 2016) - to consider road safety and sustainable mobility generally, while paying special attention to the needs of those in vulnerable situations, including people with disabilities. The resolution also called on governments to take a leading role in implementing the road safety-related SDG targets and the activities of the Decade of Action for Road Safety 2011-2020, as well as invited them and the international community to intensify both national and international collaboration with a view to meeting the ambitious road safety-related targets in the 2030 Agenda for Sustainable Development (UN, 2017:10-11).

Human factors

Van Elslande, Naing and Engel (2019: 6), share that the Traffic Accident Causation in Europe Work Package 5 (TRACE WP5) project, has been dedicated to the analysis of 'Human Factors' in the field of accident causation analysis. It is aimed at contributing to a deeper comprehension of the complexity of the human aspects involved in driving ‘activity by promoting human centred methodological tools. Accidents between vehicles and pedestrians represent an important safety issue globally. Apparently, close to 20 percent of road accidents in the US involve pedestrian fatalities. Of these fatalities, 26 percent occur in rural areas, whereas 74 percent occur in urban areas. Similarly, about 17 percent of non-fatal pedestrian accidents happen in rural areas and 83 percent in urban settings. It is not surprising that pedestrian accidents are especially problematic in urban areas since pedestrian activity is much higher there. Finally, it is estimated that 40 percent of pedestrian accidents occur at intersections (Lord, Smiley and Haroun ([sa]:1)). Recently (2019-2020), during the release of the 2019/20 Festive Season Road Safety Report, the transport minister (the Honourable Fikile Mbalula) highlighted that the number of people who died on South African roads during the festive season had decreased by 10% when compared to the 2018/2019 period. The total number of fatal crashes were down by 3% from 1 438 in 2018/19 to 1 390 in 2019/2020. According to Tlali, Mofokeng and Simelane (2023:378), the results on human factors contributing to RTAs have several implications. There are possibilities that at night and in bad weather conditions, the driver might not be aware of the changing situation and may end up on the wrong side, probably travelling in the opposite direction. Safety can often be improved without reconstruction, by widening lanes or shoulders, flattening side slopes, removing, or relocating roadside obstacles, and installing traffic control devices. The responses above were so disturbing. Amongst other factors pointed out by the respondents (n=168) as leading to fatalities, reckless or negligent driving lead the pack and this includes actions like overtaking when it’s unsafe to do so, not stopping properly at stop signs or traffic lights, and changing lanes into tight spaces. It’s easy to see how these behaviours contribute to the high number of road accidents. It is the view of the researcher that motorists and other road users must perceive and process information, make decisions and react, all within specific time frames. The findings of the study by Nkosi, Mofokeng and Ndou (2023:689) confirm the above. When asked which factors contribute more to road fatalities within the Govan Mbeki area, most participants

concurred that human error is the most contributing factor to road traffic fatalities, although many efforts and law enforcement of road traffic duties, as well as awareness programs for road users on the importance of safe road user behaviour. In most cases (about two thirds) of the accidents recorded, human error was present. Lack of law enforcement visibility is seen as the major factor that encourages bad driving behaviour, as most of the motorists behave appropriately when they see traffic officers.

Attitudes of road users

Attitudes of road users are based on the pursuit of successful achievement in life. In many instances, unfortunately, these goals are open pursuits without due regard to safety (Cloete, 1984: 32). A lack of responsibility and a variety of attitudes and perception about the traffic situation abound among the public. As a result, the factors detailed in the section to follow appear to be the most prominent and most important elements to understand the attitudes of road users.

Perception about own abilities

The average person considers him/herself as too superior to be involved in a traffic accident because of their capabilities. Others have a fatalistic attitude and believe that accidents are predestined to happen and there is nothing one can do about it. Still others believe that a good road or safe vehicle will prevent them from being involved in an accident (Sinclair, 2013: 1).

Driving habits

Some individuals are inclined to trade risk, which endows a feeling of importance on these drivers. Trademarks of such drivers are daredevil and inconsiderate driving, dangerous overtime and a general attitude of contempt, both for the law and other road users (Cloete, 1984: 32).

Bio-physical factors

Researchers emphasise the importance of the road user's sensory perception in accident causation. Humans are biological, as well as, psychological beings and physical state and sense, such as illness, affect their mental state and sense (Cloete, 1984: 32).

Fatigue

The RTMC (2018: 1) mentions that fatigue adversely affects the already demanding compliance and response tasks of motor vehicle drivers. Fatigue is characterised by time disorientation and delayed reactions, restricted field of vision (tunnel vision), where the level of driving ability is reduced, and courtesy disappears. The concern about and importance of physical and mental fatigue, is reflected in the denegation in alertness, weakness, and general standard of driving. In South Africa, drivers have a significant distance to various destinations. The National Road network alone covers 19,704 kilometres (km), the total distance covered by the roads are, however, much more. Global Positioning System (GPS) navigation leader Tom has revealed that paved roads cover 162 665 km and unpaved roads 526 km (RTMC, 2018: 1). With these long distances, it becomes more important for Road Safety Authorities to emphasise the need for driver fitness and especially the risk of driver fatigue, (Arrive Alive, 2016: 1). It is easy to underestimate the effect fatigue can have on a driver. Research reveals that driver fatigue is a major contributing factor in up to 20 percent of all road traffic fatalities. Tiredness is cited as one of the contributors to road fatalities and the related crashes have more devastating consequences than most other crashes (Arrive Alive, 2016: 1). One reason is that there is no breaking or steering adjustment prior to these accidents. A driver who falls asleep at the wheel, will not act to avoid an accident and consequently is much more likely to cause death or serious injury (RTMC, 2018: 1).

Fatigue-related accidents are 3 times more likely to result in serious injury or death as compared to other types of road accidents (Arrive Alive, 2016:1; RTMC, 2018: 1). The primary cause of fatigue is insufficient sleep of motor vehicle drivers, either short-term (i.e., Less than 5 hours sleep in the last 24 hours) or long-term (less than 12 hours sleep in the last 48 hours and less than 50 hours sleep in the preceding week). Other contributing factors can also include a driver's eating patterns, fitness and general health. With many hours spent on the road, driving long, straight roads at relatively constant speed. Safe drivers know to be vigilant for signs of fatigue, especially between 2–5 *Ante Meridiem* (AM), and during a sleepy dip around 2 *Post Meridiem* (PM) (RTMC, 2018: 1).

Table 1: Number of fatalities per province in South Africa

YEAR	Eastern Cape	Free State	Gauteng	Kwa-Zulu-Natal	Limpopo	Mpumalanga	Northern Cape	North West	Western Cape	Republic of South Africa
2016- 2017	239	197	341	393	285	202	64	137	148	2006
2017-2018	227	144	315	330	203	187	36	157	171	1770
2018-2019	-	-	-	-	138 crashes, with 178 fatalities;	-	-	-	-	-
Change	-12	-53	-26	-26	-82	-15	-28	20	23	-236
% Change	-510	-26,9	-7,6	-28.8	-7,4	-7,4	-43,8	14,6	15,5	-11,8

Source: RTMC (2018:1) and Patrick (2019:1)

Whereas, from table 2, it can be deduced that the number of road traffic fatalities for Vhembe District Municipality, under which Musina Municipality falls, has been increasing for the period of three years (2016 - 205, Festive Season, 2017 - 105, Easter Season and 2018 - 75, Festive Season). The recorded decreases were minimal as shown herewith.

Table 2: Festive and Easter Seasons road fatalities in the Musina Local Municipality

Period	Number of accidents	Serious injuries P1 and P2	Minor injuries P3	Total number of injuries	Fatalities
2015/16 Festive Season	96	87	113	200	41
2016 Easter Season	68	37	77	114	13
2016/17 Festive Season	205	66	167	233	31
2017 Easter Season	105	20	66	86	9
2017/18 Festive Season	75	39	68	107	18

Source: RTMC (2018:1)

Research Methodology

This study was conducted in the Musina Local Municipality, which falls within the Vhembe District Municipality, which is made up of four local municipalities, namely Musina, Makhado, Thulamela and Collins Chabane, of which Musina Local Municipality is bounded by Makhado Local Municipality to the South and Thulamela local Municipality to the east. The study followed a qualitative research design, that seeks in-depth exploration of the subject under study. Data collected hence provided rich descriptions and information from the participants' viewpoints, experiences, meanings and opinions regarding school safety implantations towards understanding human factors as critical elements contributing to road traffic fatalities in the Musina Local Municipality. Welman, Kruger and Mitchell (2005: 52), state that the qualitative research approach are useful in an empirical research design to obtain relevant information. The qualitative research approach shares these characteristics.

Maxfield and Babbie (2011: 226), explain that the population is the theoretically specified grouping of study elements. According to Sarantakos (2013: 166), the most significant issues researchers have to consider when conducting a study refers to the type and number of participants to be included in this study. In addition, Wellman, Kruger and Mitchell (2008: 52), state that the study population relate to the study objects, consisting of individuals, groups, organisations, human, products and events, or to the conditions to which they are exposed. In this study, the target study population were individuals who have experience in understanding human factors as critical elements contributing to road traffic

fatalities in the Musina Local Municipality. According to Sarantakos (2000) (in Flick, 2014: 8), the major rationale for sampling is the feasibility. For this study, the researcher used non-probability, purposive sampling for the selection of participants and two data collection methods were used in this study; literature study and face-to-face interviews.

Findings

Exploration human factors as critical elements contributing to road traffic fatalities

This question that was posed to all the selected participants of this study was: *'which Human Factors are viewed as critical elements contributing to road traffic fatalities in the Musina Local Municipality?'* These participants shared consensus on the following factors regarding the critical elements contributing to traffic fatalities:

"Fatigue, alcohol and speeding" ---------- **P1**

"Use of cell phones while driving and overloading"---------- **P11**

"Illegal overtaking (i.e. Barrier Lines)" ----------**P6**

Literature review also revealed that road fatalities in the Khomas Region, Windhoek (Namibia) were linked to environmental risk factors which included technical components of the (i.e., driving on the main road), and holding high traffic volumes without consideration to proper road safety strategies, such as road traffic lanes separation and suitable road infrastructure, as well as signs alongside the roadway. Human behaviour elements include pedestrians, drivers and road users with unchanged road construction and road networks, weaknesses in traffic regulation enforcement, corruption, irresponsibility, and poor management. Moreover, Van Elslande, Naing and Engel (2019), highlighted deeper comprehension of the complexity of the human aspects involved in driving activity by promoting human centred methodological tools. South Africa is not the only country facing this problem, as illustrated by various scholars in this study. Nkosi et al. (2023:693) analysis revealed that more than 90% of road accidents are caused by human error. The only option to deal with challenges caused by humans, is by filling the need to capacitate drivers to always think before making decisions that can cost them their lives, or that of any other road user. The current K53 driving method utilised in South Africa, has not delivered any positive results beyond our expectations, as learner drivers only study the K53 method to acquire learner licences and driving licences. But there are no control measures to monitor and to ensure that all those new drivers are well trained to become good drivers, who are capable of upholding road safety as their primary responsibility.

Efforts of utilising an electronic learner licence test are seen as hindrance for those who want to qualify to be learner drivers. Because that does not allow manipulation of results. If the learner has failed the learner's test, he or she should start afresh with the bookings to sit for the learner's test again. Whereas with the current manual set up, results can be manipulated to pass the learner even if the test has been failed, because it's manually written and marked by the examiner alone. No moderation conducted for the test, and for the fact that it's only one test written, it does not create credible drivers, because if you can cram the answers for the test and pass the test but remain ignorant about the driving procedures and rules of the road. Since the test is divided into three categories, namely rules of the road, road signs and markings and vehicle control system, at least three separate tests should be written to ensure that, by the time learner license is issued, the learner will have displayed enough competency to be issued with a learner licence. Furthermore, on the practical driving test, the learner driver should undergo several tests before he can be issued with a driving license. The test should be divided into four categories at least and the following situational test should be conducted by being tested under normal dry weather conditions, under wet or rainy conditions, under high traffic volume and night driving conditions. After a learner has undergone all these tests and found to be competent, then he or she may be issued with a driving license, subject to reviewable conditions and periods.

Among the conditions that the driver should adhere to is to not be found committing road traffic violations during that period. Should the driver be found to have been issued with a traffic violation fine in his first three-year period, his or her license should be suspended for a period not exceeding 6 months. If the driver is found to be a repeat offender, then his or her driving license should be revoked, and the driver should be suspended for a period not exceeding three years, after the completion, he or she will have to undergo the same test starting from a learner's license up to a driver's license. These conditions will not only create competent drivers, but it will also encourage responsible road user behaviour, where any driver will always be cautious when using the road, because he or she will not want to lose his or her driving license, especially if that driving license is a much-needed document to obtain employment and to be able to do business. A question asked on Arrive Alive on "how do I become an instructor of driving school" the response indicated that no formal qualification is required to be an instructor of driving licences. Any person who wishes to be an instructor, can do so by applying at the nearest DLTC and completing a prescribed form and be

subjected to a test. Should you pass the test you will be issued with an Instructor Certificate. No study has been done, despite the finds, yet the high level of accidents reveals the need for future a study in this regard, as more studies were focusing more on the causes and impact of accidents, and not specifically on the need to professionalise driving schools as a major step to curb road fatalities (Nkosi et al., 2023:693). Subsequently, Lord, Smiley and Haroun ([sa]), shared that, in the US pedestrian fatalities in rural areas were 26% and in urban areas 74%. Approximately 17% of non-fatal pedestrian accidents happen in rural areas and 83% in urban settings. Therefore, it was not surprising that pedestrian accidents are especially problematic in urban areas, since pedestrian activity is much higher there and 40% of pedestrian accidents occur at intersections. Furthermore, Blincoe *et al.,* (2015), confirmed that, in 2010 there were 32,999 people killed, 3.9 million were injured and 24 million vehicles were damaged in motor vehicle crashes in the US.

As the follow-up question, this question *"can human factors as critical elements contributing to road traffic fatalities be addressed effectively by the Musina Traffic Department?"* was asked to all the selected participants. They all shared the following in this regard (Participants verbatim expressions):

> *"The police alone cannot address road traffic fatalities".*----------**P17.**
>
> *"Partnership policing is required, whereby a multi-agency approach where many role players work together in partnership to address crime and community safety, with the aim of developing community (traffic) policing partnership as an organisational philosophy and strategy for community building and problem solving"* ---------- **P10.**
>
> *"Partnership policing is seen as a cooperative effort to facilitate a process of problem-solving to determine community needs and policing priorities by means of consultation*"
> ----------**P15.**
>
> *"Partnership will assist in establishing structures that can facilitate communication between the community and the police"*----------**P4.**
>
> *"Such structures should include the community at large, as well as all other relevant stakeholders in the criminal justice process (I.e. Policing agencies, courts, correctional services). The role players' needs can be determined through surveys, interviews, workshops, community profiles or other measures. The main is to establish an enduring partnership between police and all communities to ensure more effective protection of the community and a better quality of life"*
> ----------**P20.**

According to the Daily News Reporter (2018), the majority of the accidents that occur are caused by human factors in South Africa, with an average, over 40 people a day being fatally injured and at least 20 being left permanently disabled. Equally, Patrick, (2019) submitted that there were 1,612 deaths on South African roads during the 'Festive Season.'

Moreover, Verster and Fourie (2018), revealed that the high number of accidents on South African roads not only result in loss of human life with the associated pain, grief and suffering, but also has a negative effect on the well-being of South Africans and on South Africa's socio-economic development. Therefore, the fatal accidents on South African roads pose a threat to all South Africans (Verster & Fourie 2018: 1). Therefore, 'Traffic Safety Education' programmes need to involve community intervention and must take advantage of the communities' strengths in influencing early driving behaviour. Parents and guardians should take a more active and effective role as their children learn to drive. The philosophy of traffic safety education in the schools includes the idea that, the more time parents spend in the car with their student driver, the better prepared that young person will be to become a safe, licensed driver on the public roadways.

All the selected participants of this study identify the human factor as a critical element contributing to road traffic fatalities in the Musina Local Municipality. This finding is capture verbatim by survey participants as follows:

> *"Traffic officers should be visible and spread to other areas which are not being serviced"*
> ----------**P7.**
>
> *"The implementation of Administrative Adjudication of Road Traffic Offence (AARTO) system will assist in the reduction of road traffic fatalities"*
> ----------**P13.**

"There must be a regularly road safety campaigns throughout the year not during Easter and festive seasons only" ----------**P18.**

"Some of the traffic violations must be treated as criminal offences and this will serve as deterrence to the bad behaviour on public roads."-- **P3.**

Furthermore, findings of this study complement those of Bawah *et al.,* (2014) by emphasising that two categories of factors seem to be associated with traffic accidents: 1. *Traffic environment*. 2. *human factors*, though the human factor is cited to be the most influential.

Conclusion

This study suggests that road traffic fatalities in the Musina Local Municipality occur when a vehicle collides with another vehicle, pedestrian, animal, road debris, or other stationary obstruction, such as a tree or utility pole. Traffic collisions result in injury, death, vehicle, and property damage, among others. Several factors contribute to the risk of collision, including vehicle design, speed of operation, road design, road environment, driver skill and/or impairment, and driver behaviour. Across the world, motor vehicle collisions lead to death and disability, as well as financial costs to both society and the individuals involved. Furthermore, this study also suggests that several factors lead to road traffic collisions. These may include the design of the road, road environment and conditions, speed, driving skills and the driver's demeanour, among others. The high number of accidents in the study location and South African roads holistically, not only results in the loss of human life with the associated pain, grief, and suffering, but also has a negative effect on the well-being of South African citizens and socio-economic development.

Recommendations

Recommendations on exploring human factors as a critical element contributing to road traffic fatalities in the Musina Traffic Department

This study finds that there are many human factors contributing to road fatalities, this acts as a major critical element as this study confirms. The selected participants clearly understand the causative factors to road traffic fatalities, calling for the inception of measures to reduce this practice. Assistance from various stakeholders should collaborate by sharing essential information on this subject. The consulted literature in the local and international facets collaborates study findings in this regard.

It is therefore recommended that:

- Road safety resources to prevent accidents should be enhanced;
- Road safety is something pivotal that has to be followed and implemented by the government at all times to ensure the safety of the operators of vehicles, pedestrians and passengers. Traffic rules and guidelines have to be set in place and strictly followed so that serious accidents and injuries can be averted;
- Measures and methods taken to establish road safety should include the use of various road safety products. Well designed and uniquely engineered road safety products ensure the constant safety of vehicle operators and pedestrians. Some of the important road safety products that are used worldwide are road barriers, road fences and road safety barriers;
- Education of motorist on human factors as a critical element contributing to road traffic fatalities should be intensified to ensure a common understanding of this practice; and
- Traffic police management should initiate stringent policies, regulations, rules and legislations to targets human factors as contributory factors to road traffic fatalities.

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