Quest Journals
Journal of Medical and Dental Science Research
Volume 4~ Issue 7 (2016) pp: 34-41
ISSN(Online) : 2394-076X ISSN (Print):2394-0751
www.questjournals.org

Research Paper

Factors Associated with Road Traffic Accidents among Survivors: A Pilot study.

Njodzi Millicent[1], Mugadza Gladys[1], Zvinavashe Mathilda[1], Haruzivishe Clara[1], Ndaimani Augustine*[1], Mhlanga Maxwell[1], Rukweza Judith[1], Kapfunde Abigail[1]

Received 17August, 2016; Accepted 05 September, 2016 © The author(s) 2014. **Published** with open access at **www.questjournals.org**

Abstract: *The purpose of this study was to determine the factors associated with road traffic accidents among survivors aged from 18 to 55 years attending the Parirenyatwa Group of Hospitals. A non-experimental, descriptive design was employed in this study. Non-probability convenient sampling was used to select 30 study participants. Data collection was done using self-administered questionnaires and Statistical Package for Social Sciences (SPSS) was used to analyse data. Findings of the study reflected environmental factors as the major driving factor of RTA's with scores (% average total score was 72.5) followed by personal factors (% average total score was 39.7) and lastly the mechanical factors (% average total score was 38.3). Many of the respondents thought that bad weather, traffic congestion or business of roads and poor road conditions were significant contributors to the RTAs they were involved in. Distractions by the phone or due to eating for example were not considered the causes of RTAs by all of the respondents, but eleven (36.7%) of them were not certain. Mechanical factors had the lowest scoring in factors associated with road traffic accidents. The vehicle making, regular servicing and licensing as well as faulty vehicles were the mechanical factors that were looked at in this study. Nineteen (63.3%) of the respondents excluded faulty vehicles from the factors that contributed to the accidents. This can be because of the Vehicle Inspection Department's efforts in vehicle checks. Four (13.3%) of the respondents were sure they contributed and seven (23.3%) were not sure.*

Keywords*: Associated factors, Pilot study, Road Traffic Accident, Zimbabwe.*

I. INTRODUCTION

A road traffic accident (RTA) is one that takes place on a road or in a place to which the public have access and leads to the injury or death of one or more people. It can also be referred to as a traffic collision, a motor vehicle collision (MVC), a traffic accident, a motor vehicle accident or a road traffic collision (Lum and Reagan, 1995). Currently, RTAs are graded as the ninth cause of deaths with more than a million people dying worldwide and more than 2500 people dying daily.

RTAs are anticipated to increase until they become the seventh top cause of death worldwide by year 2030, if no rigorous action is taken to reduce their occurrence. Approximately 90% of RTA associated deaths and injuries occur in the developing countries (WHO/ Road traffic injuries, 2015)

The developing countries in sub-Saharan Africa have the highest rates of accidents worldwide. Examples include Uganda, Angola and Nigeria which were among the top ten 2014 country rankings of RTA deaths per 100 000 people worldwide that were published by the WHO (WHO/ Road traffic injury prevention, 2014).

Despite the rigorous driving training and testing by the Traffic Safety Council of Zimbabwe (TSCZ) to ensure that all drivers are experienced, the ongoing work to improve road infrastructure, awareness campaigns and vigorous road law enforcement, there still has been an increase on the number of patients being admitted due to RTAs at the Parirenyatwa Group of Hospitals. The average monthly admission cases due to RTA at Parirenyatwa Orthopaedic ward (B11) is 35% for the year 2015 (Parirenyatwa Group of Hospitals Statistics Records).Zimbabwe has been ranked number 126 on world rankings of deaths due to RTAs done by the WHO in 2014. Despite the increasing rates of RTA occurrences, very few studies have been done in the field of RTAs in Zimbabwe.

According to the Zimbabwe Republic Police 2014 annual traffic report, a total of 37 619 RTAs were recorded from January 2013 to December 2013 compared to 41 016 recorded from January 2014 to December 2014, reflecting a nine percent increase on the number of RTAs in the country. From the year 2009 to 2014, an

average of 1 824 people died each year due to road traffic accidents. This means that about five people die on the Zimbabwean roads every day while 38 others are injured.(The Chronicle, 2015).

According to the WHO statistics, 90% of the world's road traffic accident deaths occur in low and middle income countries, even though these countries have approximately half of the world's vehicles. If no action is taken to reduce RTAs, they are then predicted to rise to become the 7th leading cause of death by 2030, globally. Road traffic injuries have been neglected from the global health plans for many years though they are predictable and preventable. Road safety needs to be addressed holistically involving multiple sectors which include transport, police, health and education. Research into road safety in developing countries is scarce, especially in Africa. This is inconsistent with the size of the problem. The purpose of this study was to determine the factors that are associated with road traffic accidents among survivors aged from 18 to 55 years attending the Parirenyatwa Group of Hospitals (PGH) in Harare, Zimbabwe.

II. MATERIAL AND METHODS

This study was conducted using the descriptive quantitative cross sectional study design. Data was obtained from recruited respondents who presented at Parirenyatwa outpatient department at the orthopaedic clinic and in the orthopaedic wards. Parirenyatwa Group of Hospitals is one of the largest referral centres in Harare, the capital city of Zimbabwe. This site was purposively selected because of huge volumes of patients with road traffic orthopaedic issues that are assisted here. The cases that are handled here are from all the province of the country giving and added advantage of getting details from a representative group.

Data was obtained from 30, conveniently sampled, road traffic adult male and female survivors aged between 18 to 25 years being attended at Parirenyatwa Group of Hospitals. The sample size was selected based on the central limit theorem. The critically ill and those who were unwilling to participate in this study were excluded. Data was gathered at one point in time using a self-administered questionnaire with closed ended questions being addressed to the participants. The researcher informed the participants about the research, the risks and benefits of participating in the study and their rights. Confidentiality was also assured to participants by the researcher. A consent form was signed by participant before participation initiated in the study. Permission to carry out the study was granted by The Joint Research Ethics Committee for University of Zimbabwe and Parirenyatwa Group of Hospitals.

III. RESULTS

3.1Demographic data

The age range of the 30 respondents ranged between 18 and 55 years. The mean age was 31 (SD=5.6 years). Nineteen (63.3%) were married and none were cohabitating or in separation. While 8 (26.7%) were students, 13 (43.3%) were self-employed. In terms of monthly earnings 15 (50%) earned between US$301 and US$ 500. Ten (33.3%) participants earned below US$100 and the remainder 5 (16.7%) had a monthly income above US$ 500. Eleven (16.7%) had no children. The remainder 19 (63.3%) had at least one child, with 4 (13.3%) having had more than three children. On the other hand, 16 (53.3%) resided in an urban area while 11 (36.6%) stayed in a rural area and none of the respondents stayed in a mining area. Demographic characteristics of the respondents are summarised in table 1 below.

Table 1: Demographic data (N =30)

Variable	Response	Frequency	Percentage
1.Age	18-25	11	36.7
	26-35	7	23.3
	36-45	9	30
	46-55	3	10
2.Gender	Male	21	70
	Female	9	30
3.Marital status	Single	10	33.3
	Married	19	63.3
	Widow	1	3.3
	Cohabiting	0	0
	Separated	0	0
4.Employment status	Student	8	26.7
	Employed	7	23.3
	Unemployed	2	6.7
	Self-employed	13	43.3
5. Monthly earnings (US $)	<100	10	33.3
	100-300	0	0
	301-500	15	50
	>500	5	16.7
6.Number of children	None	11	36.7
	One	4	13.3

	Two	5	16.7
	Three	6	20
	More than three	4	13.3
7.Place of residence	Urban area	16	53.3
	Peri-urban area	3	10
	Rural area	11	36.7
	Mine	0	0

3.2 Information About The Accident

The information that was collected in this study was about road traffic accidents that occurred in 2016. Out of the thirty respondents, thirteen (43.3%) were involved in the accidents on normal working days, eleven (36.7%) of the accidents occurred during weekends and six (20%) on public holidays. Eight (26.7%) of the accidents occurred in the morning, seventeen (56.7%) in the afternoon and five (16.7%) occurred during the night. Seventeen (56.7%) of the respondents had experienced accidents along city roads, five (16.7%) along rural roads, four (13.3%) along the highways, one (3.3%) over a bridge and three (10%) at road intersections.

Nine (30%) of the respondents were involved in accidents as pedestrians, ten (33.3%) were drivers, ten (33.3%) were passengers and one (3.3%) was a cyclist at the time of occurrence of the accidents. Those who were walking on foot were nine (30%), one (3.3%) was using a motorcycle. Fourteen (46.7%) respondents reported that no people died in the accidents and one (3.3%) respondent reported that ten or more deaths occurred in the accident. Table 2 below summarises the findings on information about the accident.

Table 2: Information about the accident (N =30)

Variable	**Responses**	**Frequency**	**Percentage**
Day of occurrence	Normal working day	13	43.3
	Weekend	11	36.7
	Public holiday	6	20
Time of occurrence	Morning	8	26.7
	Afternoon	17	56.7
	Night	5	16.7
Place of occurrence	City road	17	56.7
	Rural road	5	16.7
	Highway	4	13.3
	Bridge	1	3.3
	Roads intersection	3	10
Category of road-user	Pedestrian	9	30
	Driver	10	33.3
	Passenger	10	33.3
	Cyclist	1	3.3
Type of vehicle used	None	9	30
	Motorcycle/Bicycle	1	3.3
	Personal car	4	13.3
	Lorry	2	6.7
	Commuter omnibus	13	43.3
	Bus	1	3.3
Number of deaths	None	14	46.7
	<5	10	33.3
	Between 5 and 10	5	16.7
	10 and above	1	3.3

3.3 Personal factors associated with road traffic accidents

Speeding was thought to have contributed to the occurrence of the accidents in eighteen (60%) of the cases although 7 (23.3%) did not consider over speeding as a contributing factor to the accident. Five (16.7%) respondents were not sure. Eighteen (60%) thought inexperienced driving did not contribute to the accidents. Nineteen respondents cited distraction by either a structure or other vehicles as having contributed to the accident.Nevertheless, 24 (80%) respondents thought tiredness of the driver was a contributor to the accidents.

3.4 Environmental factors associated with road traffic accidents

Bad weather was associated with the occurrence of the accidents cited by 22 (73.3%) of the respondents but 3 (10%) did not consider bad weather a contributing factor. All the respondents associated poor road conditions to the occurrence of the accidents and all of them did not consider inappropriate fencing for animals on the roadsides as a contributing factor to the accident occurrences. Traffic congestion or busy roads was a contributing factor in all the respondents.

3.5Mechanical factors associated with road traffic accidents

Nineteen (63.3%) out of the thirty respondents did not associate faulty vehicles to the accident occurrence, while 4 (13.3%) thought it was a contributing factor. Poor vehicle make was not a contributing factor in all the respondents. Unlicensed vehicles with no regular servicing of the vehicle contributed to accidents which had involved24 (80%) of the respondents. However, 4 (13.3%) did not think of unlicensed driving as having contributed to the accidents.

The research findings on all the factors associated with road traffic accidents that this study looked at are summarised in table 3 below.

Table 3: Factors associated with RTAs (N=30)

Category of factors	Factors	Responses	Frequency	Percentages
Personal factors	Speeding	Yes	18	60
		Not sure	5	16.7
		No	7	23.3
	Inexperienced driving	Yes	7	23.3
		Not sure	5	16.7
		No	18	60
	Alcohol intoxication	Yes	2	6.7
		Not sure	10	33.3
		No	18	60
	Reckless driving or walking	Yes	0	0
		Not sure	1	3.3
		No	29	96.7
	Distractions	Yes	0	0
		Not sure	11	36.7
		No	19	63.3
	Tiredness of the driver	Yes	24	80
		Not sure	4	13.3
		No	2	6.7
Environmental factors	Bad weather	Yes	22	73.3
		Not sure	5	16.7
		No	3	10
	Poor road conditions	Yes	30	100
		Not sure	0	0
		No	0	0
	Traffic congestion	Yes	30	100
		Not sure	0	0
		No	0	0
	Inappropriate fencing for animals on roadsides	Yes	0	0
		Not sure	0	0
		No	30	100
Mechanical factors	Faulty vehicles	Yes	4	13.3
		Not sure	7	23.3
		No	19	63.3
	Poor make of vehicle	Yes	0	0
		Not sure	0	0
		No	30	100
	Unlicensed vehicle and poor servicing	Yes	24	80
		Not sure	2	6.7
		No	4	13.3

3.6 Total scores, averages and percentages of the factors of RTAs

Personal factors had an overall total score of 143 out of a total possible overall score of 360. The mean total score was 4.7 and the maximum possible score per each individual was 12. The mean total score percentage was 39.7%. The total score of environmental factors was 175 out of a total possible overall score of 240. The mean total score was 5.8 and maximum possible score per each individual was 8. Environmental factors had the highest mean total score percentage of 72.5%. Mechanical factors had a total score of 69 out of a maximum possible score of 180. The maximum possible score per each individual was 6 and the mean total score was 2.3. The percentage mean total score was 38.3%. This data is summarised in table 4.

Table 4: Total scores, means and percentages (N=30)

Factors	Total scores	Maximum possible overall score	Mean total scores	% mean total score
Personal factors	143	360	4.7	39.7
Environmental factors	175	240	5.8	72.5
Mechanical factors	69	180	2.3	38.3

IV. Discussion

4.1 Sample Demographics

Thirty people, male and female, participated in this study and the gender ratio was 7:3 respectively. This ratio is in line with the World Health Organisation 2012 report which also revealed that males are more affected than females. In 2006, 71% of the RTA fatalities were males (WHO, 2012). According to the 2012 Zimbabwe census report more males are economically active than females and thus males are probably on the move or in the roads mostly than females (ZIMSTAT, 2012). The most productive age range (18 to 35 years) constituted the greater proportion of the study participants and was the same group had the highest risk of RTAs owing to the frequency of movement from point A to B. The highly economically active group in Zimbabwe is also the highly reproductive age-group. Fertility increases from age 15 to 25 and it is at its steepest decline from age 30 to 34 among women in Zimbabwe (ZDHS, 2011).The biggest proportion of the sample was married in line with the Zimbabwean population distribution by marital status. According to the 2011 Zimbabwe Demographic Health Survey (ZDHS) report, 59% of women and 50% of man in Zimbabwe are married. Eight respondents (26.7%) were students, seven (23.3%) were employed, two (6.7%) unemployed and thirteen (43.3%) were self-employed. These findings explain the need for students and young heads of families to be on the roads to secure their future and to look after their families.

Only five respondents earned slightly above the poverty datum line (US$ 500 per month). Zimbabwe is a developing country and the largest population is poor due to poor economic development. Most people cannot afford to buy personal cars therefore they are forced to use public transport, to walk or to ride bicycles/motorcycles. High use of public transport increases the number of victims when accidents occur. According to Nantulya and Reich (2002) pedestrians, cyclists and motorcycle riders are the most vulnerable and heaviest road-users in poor countries.

Sixteen respondents (53.3%) resided in urban areas, three (10%) in peri-urban areas while eleven (36.7%) stay in the rural areas. There is less traffic in the rural areas than in urban areas hence there is a reduced risk of being involved in a RTA in people who reside in the rural areas unless they travel for some reasons to the urban areas. However, the number of those that stay in the rural areas is also high due to the fact that these people may not be accustomed to the busy roads and traffic in urban areas when they would have travelled there. This increases their risk of being involved in RTAs especially the pedestrians.

4.2 Information about the accident

Thirteen (43.3%) of the study respondents reported that the accidents they were involved in occurred on normal working days, eleven (36.7%) occurred during weekends and six (20%) on public holidays. There are very few public holidays in a year but 20% of the respondents were victims to accidents that occurred on these few public holidays. According to the Traffic Safety Council of Zimbabwe 2013 report, human error is one of the major causes of accidents in Zimbabwe. People drink alcohol and drive and they are usually in an excited mood during holidays such that concentration on the road is reduced and judgement is impaired. The distribution of time of occurrence of the accidents was such that eight (26.7%) of them occurred in the morning, seventeen (56.7%) in the afternoon and five (16.7%) occurred during the night. The fact that the highest proportion of accidents occurred during the day can be explained by the frequency of travelling which reaches its peak during the afternoon, with people going to different business areas. Busy roads increase the risk of RTA occurrence (TSCZ, 2013).

Most of the accidents (56.7%) occurred along city roads and this can be attributed to the fact that city roads are busier than rural roads. A lot of activities are done in the city and people inevitably travel to the city for various reasons. Nine (30%) of the respondents were pedestrians, ten (33.3%) were drivers, ten (33.3%) were passengers and one (3.3%) was a cyclist at the time of occurrence of the accident. According to Nantulya and Reich (2002) pedestrians, public transport users and cyclists are the heaviest road users in developing countries like Zimbabwe and they are at a high risk of being involved in RTAs. This explains why many pedestrians and public transport passengers constituted a significant percentage of those who participated. Fourteen (46.7%) of the accidents were not fatal but sixteen (53.3%) of the respondents reported that there were deaths in the accidents they were involved in. An annual traffic report (2014) by the Zimbabwe Republic Police showed that about 5 people die daily due to RTAs in the Zimbabwean roads while 38 others are injured. (TSCZ, 2014)

4.3 Factors associated with road traffic accidents

Environmental factors had the highest scores (% average total score was 72.5) followed by personal factors (% average total score was 39.7) and lastly the mechanical factors (% average total score was 38.3). Many of the respondents thought that bad weather, traffic congestion or business of roads and poor road conditions were significant contributors to the RTAs they were involved in. There has been a significant increase on the number of vehicles in Zimbabwe while the road infrastructure remains unchanged or is even worsening with little or no improvements in road designs. Elvik and Vaa (2004) points out that when traffic increases by 100% the number of traffic injuries will increase by about 80% and number of fatal accidents will increase by 25%.

People do not have much influence on weather. Mist, rain, sun and extreme heat may increase the risk of RTAs occurrence by obscuring the driver's view and making it difficult to stop in time. Peace and Maunder (2000) included weather among the external factors that influence road traffic injuries especially during the rainy season in Zimbabwe. Heavy rain causes the roads to be slippery and soil erosion narrows and damages the roads especially the gravel roads. None of the respondents mentioned stray animals as a contributing factor to the RTAs. This can be attributed to drivers' alertness on the roads and efforts by the government to fence animal zones along roadsides.

Personal factors had the second highest scoring and these included speeding, driver tiredness, inexperienced driving, distractions (phone), reckless driving and alcohol intoxication. 85% of RTIs in Zimbabwe are due to human factors (Jokonya, 2006). The highest proportion of the respondents (60%) implicated speeding as a contributing factor to the accidents. In Zimbabwe speed is used as a marketing tool and a condition for employment for long distance drivers while in urban areas it is used to capitalize on earnings (Peace and Maunder, 2000). Unfortunately, the chances of RTA occurrence and their severity are directly related to increase in average speed (Nilsson, 2004). Inexperienced driving, alcohol intoxication and reckless driving did not contribute to RTAs in the majority of the respondents. This may be due to the recent increase on traffic police vehicle checks in the country. The reasons could also be that it is difficult to tell if the driver is alcohol intoxicated when you are a passenger and there is no way you can demand a driver's license from the driver to prove that he is licensed.

Distractions by the phone or due to eating for example were not considered the causes of RTAs by all of the respondents but eleven (36.7%) of them were not certain. This can be attributed to the fact that the accident occurs as soon as the driver gets distracted meaning that there is no enough time to observe or notice that the driver had diverted attention slightly from the road. Twenty-four out of the 30 respondents (80% of the respondents) believed that the driver's tiredness was directly related to the occurrence of the accident. Tiredness of drivers in Zimbabwe is common in commercial and public transport drivers because of the long working hours and long travelling distances. A study by Peltzer (2008) showed that about 24% of heavy vehicle road accidents were associated with sleeping while driving in South Africa and this situation also applies in Zimbabwe.

Mechanical factors had the lowest scoring in factors associated with road traffic accidents. The vehicle making, regular servicing and licensing as well as faulty vehicles were the mechanical factors that were looked at in this study. Nineteen (63.3%) of the respondents excluded faulty vehicles from the factors that contributed to the accidents. This can be because of the Vehicle Inspection Department's efforts in vehicle checks. Four (13.3%) of the respondents were sure they contributed and seven (23.3%) were not sure. People cannot be sure if the vehicle is faulty because the effects are not always obvious. None of the respondents thought that the make of the vehicles meaning the type of material used and availability of safety devices in the vehicle such as appropriate seat belts, contributed to RTAs. This may be because most people are unaware of the standard material and standard safety devices vehicles should have to promote safety. Most Zimbabweans grew up using public transport hence the safety precautions knowledge was left for the drivers. (Clementine, 2008)

Twenty-four (80%) of the respondents believed that the vehicles were not receiving regular servicing and that could have contributed to them being involved in the RTAs. Vehicle road-worthiness is a reason for worry since vehicle factors contribute to about 10% of RTIs in Zimbabwe (TSCZ, 2013). Most vehicles are imports from Japan which would have been used for years and have instructions of full servicing before use. Most Zimbabweans cannot afford to purchase new cars hence they buy cars which are no longer road worthy in some countries. Not only are the vehicle operational charges high but also Zimbabwean vehicle mechanics are not fully equipped to maintain these types of automatic vehicles (Dube and Mawere, 2011). Unlike other countries which are banning the use of Japanese second-hand cars which are not roadworthy, Zimbabweans are allowed to purchase these vehicles and to use them. One of the countries that banned the use of such cars was South Africa (Dube and Mawere, 2011).

4.4 Implications of the study findings

The nursing profession and health care delivery system is dynamic and adapts to the ever-changing needs of the society. Research generates new knowledge, adds knowledge to that which already exists and thus influences practice. Environmental factors contributed to the occurrence of the accidents more than personal and mechanical factors. It is the role of health promoters and government line ministries to educate the community on ways to prevent RTAs. Development of social marketing packages and focused client teaching is founded on the research findings on the prevailing factors attributed to RTAs. Reducing costs related to RTAs will significantly contribute to national development and growth of a country's GDP by cutting on expenses related to RTAs. The knowledge generated in this study provides a basis for other future studies in the health especially epidemiology.

4.5 Study limitations

The sample size used was small because of limited time to carry out the study. This makes generalisation to the larger population difficult. Non-probability (convenient) sampling is liable to bias compromising population representability and accuracy of results. There could also be other factors associated with RTAs that were not included in the study and they could not be established due to limitations of the descriptive quantitative study design that was used. The study recommends a bigger representative study to be carried out using mixed methods for easy triangulation of attributed causes and inference.

V. Conclusion

RTAs are a cause for concern in Zimbabwe where they are increasing despite the rigorous efforts by the police and the TSCZ to reduce their occurrence. Environmental factors were seen to be the largest contributing factors to the occurrence of accidents followed by personal factors then lastly, the mechanical factors. The research findings show that there is need for RTA prevention campaigns where the public will be educated on the factors that contribute to RTAs and how they can be prevented. There is also the need for multi-sectoral approach to work towards reduction of RTAs for example the health sector working together with the police.

REFERENCES

[1]. Academy staff. 2004. The Shocking Truth about Road Trauma - Key text. NOVA - Science in the News. Austrian Academy of Science. Retrieved 2016-03-08.

[2]. Aeron-Thomas, A., Downing, A.J., Jacobs, G.D., Fletcher, J.P., Deslby, T. and Silcock, D.T. (2002) A review of road safety management and practice. Final report. Crowthorne, Transport Research Laboratory and Babtie Ross Silcock (TRL Report PR/INT216/2002)

[3]. Andersen R.M, Rice T.R, and Kominski G.F., (2007) Changing the U.S. Health Care System. (3rd Ed). Jossey-Bass, pp. 187–190.

[4]. Azami-Aghdash, S. Ghojazadeh, M. Fardid, M. Aghaei, H. Nikanfar, R. Mohseni, M (2014) Systematic Review and Content-Analysis of Service Quality Indicators Provided to Patients with Cardiovascular Disease Using Donabedian Model.

[5]. Babbie, E. R. (2010). The practice of social research. (6th ed).Belmont, Calif: Wadsworth Cengage.

[6]. Boote, D. N. and Beile, P.(2005). Scholars before researchers: On the centrality of the dissertation literature review in research preparation. Educational Researcher;34 (6):3-15

[7]. Broughton & Walter (2007). Trends in Fatal Car Accidents: Analyses of data. Project Report PPR172 (Transport Research Laboratory)

[8]. Burns, N., & Grove, S.K. (1997). The practice of nursing research: conduct, critique and utilization. (2nd ed). Philadelphia: Saunders.

[9]. Chalya, P.L.,Mabula, J.B., Dass, R.M., Mbelenge, N., Ngayomela, I.H., Chandika, A.B. &Gilyoma, J.M. (2012). Injury characteristics and outcome of road traffic crash victims at Bugando medical centre in Northwestern Tanzania. Journal of trauma management & outcomes,6,1. http://doi.org/10.1186/1752-2897-6-1

[10]. Chief of Health Officer Queensland. 2012.The Health Of Queenslanders 2012, Queensland Government.http://www.health.qld.gov.au/cho_report/2012/documents/2012-cho-report-all.pdf, p.44

[11]. Crookes, P.A & Davies, S. (2004). Research into practice: essential skills for reading and applying research in nursing and health care. (2nd ed).Edinburgh, UK: Bailliere-Tindall.

[12]. Dawson, C.(2002).Practical Research Methods. New Delhi, UBS Publishers' Distributors

[13]. Degu, G., and Yigzaw, T. (2006). Introduction to research and research methods. Ethiopia

[14]. Donabedian, A. (1980).Explorations in Quality Assessment and Monitoring Vol. 1. The Definition of Quality and Approaches to Its Assessment. Ann Arbor, MI: Health Administration Press

[15]. Donabedian, A. (2003). An introduction to quality assurance in health care.(1st ed). New York, NY: Oxford University Press.

[16]. Epidemiology of Orthopaedic fractures and other injuries among inpatients admitted due to Traffic Accidents: A 10-Year Nationwide Survey in Taiwan. Retrieved November 20, 2015, from http://www.hindawi.com/journals/tswj/2014/637872/

[17]. Gonye,N. (2014). The civil protection unit's preparedness and its role in disaster management: the case of Nyanga rural district. Midlands State University.

[18]. Hard-Rock and Classic Music Could Lead to Road Accidents, New Survey Says". Infoniac.com. Retrieved 2016-02-13.

[19]. "Health Care." Merriam-Webster.com. Merriam-Webster, Web. 23 Mar. 2016.

[20]. Hill, J. "Getting Ahead: Returning Britain to European leadership in road casualty reduction" (PDF). Campaign for Safe Road Design. Retrieved 2016-10-01.

[21]. Hoad, T.F(2003). The Concise Oxford Dictionary of Etymology. Oxford University Press

[22]. Hsia, R.Y., Ozgediz,D.,Mutto, M.,Jayaraman, S.,Kyamanywa,P. &Kobusingye, O.C (2010). Epidemiology of injuries presenting to the national hospital in Kampala, Uganda: implications for research and policy. International Journal of Emergency Medicine, 3(3), 165-172. http://doi.org/10.1007/s12245-010-0200-1

[23]. Human error major cause of road accidents: TSCZ/ The Chronicle. Retrieved November 22, 2015, from http://www.chronicle.co.zw/human-error-major-cause-of-road-accidents-tscz/
[24]. Institute of Medicine. (2001). Crossing the Quality Chasm: A New Health System for the 21st Century. Washington D.C.: National Academy Press.
[25]. J. Stuster, Z. Coffman and D. Warren(1998). "Synthesis of Safety Research Related to Speed and Speed Management." Publication No. FHWA-RD-98-154.
[26]. Kopits, E. and Cropper, M.(2003). Traffic fatalities and economic growth. Washington, DC, WorldBank.(Policy Research Working Paper No. 3035).
[27]. Kumar, R. (2005).Research Methodology. (3rd ed). SAGE Publications Inc.London
[28]. Lagarde, E. (2007). Road Traffic Injury Is an Escalating Burden in Africa and Deserves Proportionate Research Efforts. PLoS Medicine, 4(6), 170. http://doi.org/10.1371/journal.pmed.0040170
[29]. Lawson E,F. and Yazdany, J.(2012) Healthcare quality in systemic lupus erythematosus: using Donabedian's conceptual framework. San Francisco, CA 94143, USA.
[30]. LoBiondo-Wood, & J. Haber (2006), Nursing research: Methods and critical appraisal for evidence-based practice, (pp. 27-45). St. Louis: Mosby Elsevier.
[31]. Lopez, A.D., Mathers, C.D., Ezzati, M., Jamison, D.T., & Murray, C.J. (Eds.). (2006). Global Burden of Disease and Risk Factors. Washington DC: World Bank. Retrieved from http://www.ncbi.nlm.nih.gov/books/NBK11812/
[32]. Lum, H. & Reagan, J.A. (1995). Interactive Highway Safety Design Model: Accident Predictive Module. Public Roads Magazine.
[33]. McDonald, K.M. Sundaram, V. Bravata, D.M. (2007). Closing the Quality Gap: A Critical Analysis of Quality Improvement Strategies. (Vol. 7: Care Coordination). Rockville (MD): Agency for Healthcare Research and Quality (US)
[34]. McQuestion, M.(2006).Evidence-based skin care management in radiation therapy.SeminOncolNurs.
[35]. Muvuringi, P.M. (2011). Road traffic accidents in Zimbabwe, influencing factors, impact and strategies. KIT (Royal Tropical Institute) VrijeUniversiteitAmsterdam. The Netherland
[36]. Ochieng, E.G. (2008).Framework for managing multicultural project teams. Loughborough University, Loughborough.
[37]. Peden M et al(2004) World report on road traffic injury prevention. Geneva, World Health Organization.
[38]. Pillay,S. Bland, R.M. Lessells, R.J. Manasa, J. de Oliveira, T. Danaviah,S. (2014) Drug resistance in children at virological failure in a rural KwaZulu-Natal, South Africa, cohort. AIDS Res Ther, 11 (1). p. 3.ISSN 1742-6405
[39]. Polit, D. and Hungler, B. (2008) Essential of Nursing Research: Methods Appraisal and Utilization. Lippincott, New York.
[40]. Polit, D. F., & Beck, C. T. (2004). Nursing Research: Principles and Methods. Lippincott Williams & Wilkins.
[41]. Polit, D.F., and Beck, C.T. (2003). Nursing research principles and methods. (7th ed). USA. Williams and Wilkins.
[42]. Polit-OHora,D. and Hungler, B.P.(2001). Essentials of nursing research: methods, appraisal and utilization. Lippincott, Philadelphia
[43]. Road Safety Part 1: Alcohol, drugs, ageing & fatigue (Research summary, Transport Research Laboratory Road Safety Report No. 24 ed.). UK Department for Transport. Spring 2003. Retrieved 2016/01/29
[44]. Saadat, S. and Soori, H. (2011). Epidemiology of traffic injuries and motor vehicles utilization in the capital of Iran: A population based study. BioMed Central Ltd , Vol. 11. 10.1186/1471-2458-11-488
[45]. Seers, K. and Crichton, N. (2001). Quantitative research: designs relevant to nursing and healthcare. NT Research 6:1, 487–500.
[46]. Transport and main roads (2012). 2011 Fatal road traffic crashes in Queensland, Queensland Government, http://www.tmr.qld.gov.au/~/media/Safety/Transport%20and%20road%20statistics/Road%20safety/Fatal_road_traffic_crashes_in_qld_2011.pdf, p.49
[47]. UK Department for transport. Reported road casualties Great Britain: main results 2014". Retrieved 2016-01-25.
[48]. WHO (2015) World report on road traffic injury prevention. Geneva: WHO Press.
[49]. WHO. Road traffic injuries. Retrieved November 21, 2015, from http://www.who.int/mediacentre/factsheets/fs358/en
[50]. WHO.World report on road traffic injury prevention. Retrieved March 18, 2016, from http;//www.who.int/violence_injury_prevention/publications/road_traffic/world_report/en/