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Risky Factors Influencing Bicycle Accidents among Cyclists of Chipata District, Zambia

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Abstract: ***This study investigated risky factors influencing bicycle accidents among Cyclists of Chipata District in Zambia. It was guided by Pender's Health Promotion Model. The study utilised cross sectional descriptive design and employed both Quantitative and Qualitative methods. The sample size for quantitative data was 240 cyclists derived from a population of 500. Qualitative data arose from Focus Group Discussion involving 25 accident stake holders. Quantitative data was collected by questionnaires and was analysed using the SPSS version 17, while thematic analysis was utilised for qualitative data. The findings of quantitative data showed that bicycle accidents in Chipata District were estimated at 67.5%. Most of the respondents (67.9%) involved in bicycle accidents were males, falling in the age group of 18 to 24 years. Main factors associated with bicycle accidents were: bicycle defects, lack of formal bicycle training, age (especially adolescents and young adults), alcohol and drug abuse as well as inadequate law enforcement. Qualitative research findings corroborated with findings noted above. Furthermore, the study brought out the lack of cycle tracks, inadequate law enforcement among cyclists by Traffic and RTSA officers as well as cyclists not using bicycle safety measures such as helmets, cycle lights and reflectors as additional factors associated with bicycle accidents. Based on the findings, the following recommendations were proposed for consideration: Road Transport and Safety Agency (RTSA) to introduce compulsory use of bicycle helmets, cycle lights and reflectors for cyclists. Road Development Agency (RDA) to introduce mandatory cycle tracks for all public roads. Zambia Environmental management Agency (ZEMA) to conduct capacity building among RTSA and police officers on Environmental Education. Traffic police and RTSA officers to scale up Law Enforcement among Chipata cyclists. RTSA to conduct awareness campaigns among cyclists on causes of bicycle accidents. RTSA to introduce bicycle certifying training institutions, bicycle fitness tests, number plates and a data base for easy bicycle tracking. Police training schools to include Environmental Education in their curriculum as a complementary strategy in addressing bicycle accidents. Zambian Government to establish a unit within Zambia Police Service and RTSA to offer Environmental Education in line with the Policy on Environment and RTSA to translate the Traffic Highway Code into Local Languages such as Chewa and Ngoni.***

Keywords: Bicycle accidents, Chipata District, Zambia Police, RTSA and Pender's Health Promotion Theory

1. Introduction

This section provides introductory information to this study whose orientation is to investigate risky factors influencing bicycle accidents among Cyclists of Chipata District in Zambia. Road users here include pedestrians, motorists and animals, while stakeholders of bicycles are government and private institutions such as the leadership of the Chipata Cyclist Association, Road Developmental Agency (RDA), Traffic Police, Road transport and Safety Agency (RTSA), Health personnel, teacher, Anti-corruption Commission (ACC), Church representative, Chiefs Representative, Council Representative, Bicycle passenger, pedestrians and victims of bicycle traffic accidents.

Chipata District is regarded as a home of bicycles, where their use has proved to be an effective and common mode of transport in the Province. Ever since the establishment of the now defunct Luangwa Bicycle Assembly Company, bicycles have remained dominant in the area. It has the highest number of bicycles in Zambia resulting in highest bicycle collisions, with some resulting into fatalities (Zambia Daily Mail, 2005). Everyone in Chipata District would like to associate themselves with a bicycle including politicians who use them in huge numbers during campaigns. Many politicians utilized bicycles during the 2011 tripartite elections including the former Acting President of the Republic of Zambia, Dr Guy Scott, who immensely hired a bicycle taxi for the 2011 tripartite campaigns as shown in Fig 1. Chipata District is one of the fastest growing districts in Zambia with a growing population at 26.5% (452,549) of the total provincial population of 1,707,731 (Central Statistical Office, 2010). It is described as the gate way to Malawi and Luangwa game parks with only 19 km from Malawi. It happens to be the capital of the Eastern province, situated in a valley surrounded by fertile land suitable for agriculture and was formerly called Fort Jameson which was the capital of North Eastern Rhodesia until 1911, when Northern Rhodesia (now Zambia), was created, (Zambia Daily Mail, 2005).

Figure 1: Former Acting president of Zambia (Dr Guy Scott)
Source: Post newspaper, 21st May, 2011

1.1. Statement of the Problem

In Chipata District of Zambia, dependency on law enforcement alone in addressing bicycle accidents might not be sufficient to deliver the desired road safety. So far, little was known empirically about factors which caused bicycle accidents and what measures might be put in place to complement law enforcement and other existing strategies in addressing bicycle accidents. Nonetheless, there had been attempts by law enforcement agencies to enforce relevant laws among all road users; a step in a right direction as far as prevention of road traffic accidents is concerned. It is not known why bicycle accidents continue to be on the increase despite the law enforcement measures in place. Although the available accident data was not fully disaggregated to show the magnitude of bicycle accidents, Zambia Police (2011) revealed that Chipata Police Records showed that out of 107 accidents that occurred in the month of November, 2011 about 57% of them involved at least one cyclist. This signalled that bicycle accidents alone are a serious problem in Chipata District. Comparably, while factors responsible for bicycle accidents might be known and documented from other countries, it is not known why there is little research information available on factors responsible for bicycle accidents in Chipata District of Zambia. Inadequate knowledge about the mentioned aspects could result into problems featured later in this study. In light of the above, this study investigated the factors that influence bicycle accidents in Chipata District of Zambia.

1.2. Research Objectives

This article addressed two objectives of the main study as follows:

a) To identify factors which contribute to bicycle accidents in Chipata District
b) To make relevant recommendations which can help in addressing bicycle accidents

1.3. Theoretical Framework

To underscore the importance of addressing bicycle accidents, this study applied the conceptual framework, complemented by Pender's Health Promotion Model (1982; as revised, 1996. This theory was applicable to this study because it is directed at increasing a cyclist's level of well-being.

2. Research Methodology

2.1. Location of Study

The study was located in Chipata District of Eastern part of Zambia, shown in Figure 2.

It is the Provincial Headquarters of the Province with the area of 2,616 square kilometres and is one of the fastest growing Districts in Zambia, (Central Statistical Office, 2010).

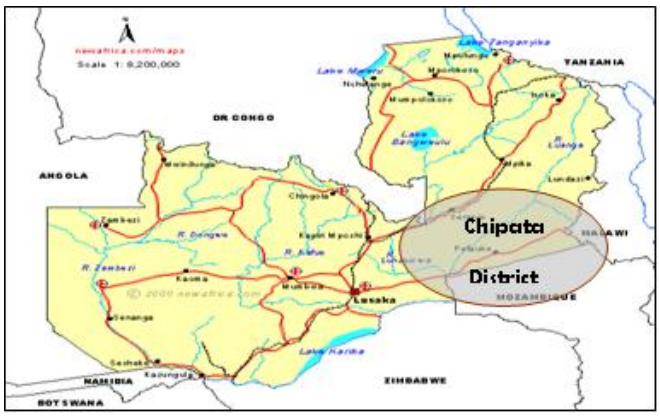

Figure 2: Map of Zambia showing the location of Chipata District (Study Area)
Source: http://www.google.com/index.html

2.2. Research Design

This study utilised cross sectional descriptive design and employed both quantitative and qualitative research methods. The methodological triangulation gave the study a depth which a single approach could not provide. Punch (1998:243) further noted that the general levels, the reasons for combining two methods are to capitalise on the strength of the two approaches and compensate for the weakness of each approach.

2.4. Study Population and Sample Size Determination

The population of this study consisted of cyclists and bicycle accident stake holders in Chipata District. A target population is specific, complete group relevant to the research project (Zikmund 2000 and Neuman 2003). A population is the entire group of persons that have the characteristics that interest the researcher. For Quantitative data, the study focused on an estimated cyclist population of 500 registered members with a local cyclist association in Chipata District (Chipata Cyclist Association, 2012). The Population for qualitative data was obtained by focusing on 25 bicycle accident stake holder institutions. The bicycle Stake holder were drawn from the leadership of Chipata Cyclist Association (3), RDA (1), Traffic Police (3), RTSA (3), Health personnel (1), teacher (1), ACC (1), Church Representative (1), Chief's Representative (1), Council representatives (2), Bicycle passenger (1), pedestrians (2) and latest victims of bicycle traffic accidents (5). The researcher picked the sample size of this study as follows: for quantitative data, sample size was 240 obtained statistically from an estimated population of 500 cyclists, determined by using EPI-INFO version 6, assuming the cause of accidents of 50%, with worst expected at 45%, plus provision of 10% for non-respondents, using the 95% confidence level. Qualitative data arose from a focus group discussion (FGD) involving twenty five (25) stakeholders who were purposively selected from relevant institutions, among them being five (5) respondents, who were chosen from traffic police records by virtue of being latest victims of bicycle accidents.

2.4. Sampling Technique

For quantitative data, respondents were selected by using Simple random sampling (SRS). Research questionnaires were administered to 240 respondents selected from a list of 500 cyclists, made available by the Chipata Cyclist Association. As for Purposive Sampling for qualitative data the researcher had the monopoly and free will to choose the respondent taking into account certain characteristics. Hence, twenty five (25) bicycle stakeholders were purposively picked for a focus group discussion (FGD).

2.5. Data Collection Procedure

Data collection was conducted by using quantitative and qualitative data instruments. The research instruments that were used in quantitative data collection were questionnaires. Questionnaires were administered to 240 respondents who were selected by using Simple random sampling. As earlier alluded to, these methods of collecting data provided an equal chance to every cyclist of being included in the study. The questionnaires were administered to the respondents after which they were collected at the end of the interview. A total of twenty five (25) respondents participated in a focus group discussion and were purposively drawn from the leadership of Chipata Cyclist Association (3), RDA (1), Traffic Police (3), RTSA (3), Health personnel (1), teacher (1), ACC (1), Church Representative (1), Chief's Representative (1), Council representatives (2), Bicycle passenger (1), pedestrians (2) and latest victims of bicycle traffic accidents (5). Participants in the focus-group session were made to feel free. This atmosphere allowed the flow of ideas on the subject under discussion. The moderator followed a pre -planned script of specific issues and set goals for bicycle accident questions and time taken was about 90 minutes. During the group session, the moderator had the difficult job of keeping the discussion on track without inhibiting the flow of ideas and comments. It was the job for the moderator to ensure that all group members contributed to the discussion and avoided letting one participant's opinions dominate. At the same time, the moderator avoided putting words into the mouth of group members. A recorder was used which later helped with transcribing the results.

2.6. Pre-Test

A Pre-test was conducted in Katete District of Zambia before the main study began. This task was necessary in order to test the methodology of the study and make corrections where possible.

2.7. Data Analysis Procedure

The data was both qualitatively and quantitatively analysed. Quantitative data was conducted statistically by using Epi info version 6.4 because of its user friendliness and further analysis was done by using SPSS version 17 being among the latest software. The database was built in consistence and validation checks to ensure data quality. Bivariate cross tabulations were conducted as preliminary analysis to determine factors that are associated with bicycle accidents and then multivariate analysis was conducted by utilising logistic regression was conducted to determine the independent factors associated with bicycle accidents with significance level at 5%. Furthermore, P-Values ≤ 0.05 were considered significant, while those above or > 0.05 were considered non-significant. Odds ratio was used for data interpretation. The computations of data were done in order to provide specific information regarding factors contributing to bicycle accidents in Chipata District and how Environmental Education could complement existing regulatory strategies to address bicycle accidents. Analysis of qualitative data was done by using thematic categorization of data. Similar responses were grouped into table themes so that a comparison could easily be done. The data analysed were tabulated into frequency distributions that led to formulation of Frequencies in certain instances.

2.8. Ethical Considerations

The study took into account all possible and potential ethical issues. The measures undertaken were to ensure compliance with ethical issues including keeping the identity of respondents confidential. Clearance for collecting data was obtained from Police high command after getting a go ahead from graduate studies at UNZA.

3. Results

This section has attempted to show that research objectives raised in this article have been adequately addressed regarding bicycle accidents.

According to Table 1 below, a total of 240 participants were enrolled into the study. About a third 77 out of 240 (32.1%) of the participants were female. The table shows the distribution of demographic characteristics and bicycle accidents between sexes. Most of the respondents were males 163 (67.9%) and in the age group 18 to 24 years 181(75.4 %). Furthermore, 119 (49.6 %) of the respondents were married. It also shows that most 164 (68.1%) of the respondents had attained secondary education. Overall, 162 (67.5%) of the respondents were involved in bicycle accidents, (See the analysis tables above).

Table 1: Quantitative Data

Item description	Category	Female	Male	Both sexes
		Total=77	Total=163	N=240
		% (n)	% (n)	% (n)
Age (years)	18-24	37.7 (29)	46.0 (75)	43.3 (104)
	25-34	62.3 (48)	42.3 (69)	48.8 (117)
	35+	0.0 (0)	11.7 (19)	7.9 (19)
Level of Education	Secondary	68.8 (53)	68.1 (111)	68.1 (164)
	College and above	31.2 (24)	31.9 (52)	31.7 (76)
Marital status	Married	46.8 (36)	50.9 (83)	49.6 (119)
	Widowed	2.6 (2)	2.5 (4)	2.5 (6)
	Single	49.4 (38)	41.1 (67)	43.8 (105)
	Divorced/Separated	1.3 (1)	5.5 (9)	4.2 (10)
Bicycle Accidents	Yes	63.6 (49)	69.3 (113)	67.5 (162)
	No	36.4 (28)	30.7 (50)	32.5 (78)
Use of bicycle safety measures (i.e. Helmet, reflectors and blue light)	Yes	0	0	0 (0)
	No	77(32.1%)	163(67.92)	240 (100%)

(Source: Adapted from Field Data, 2014)

3.1. Socio-Demographic Factors associated with Bicycle Accidents

Table 2 Table 2 presents the Socio-demographic factors associated with bicycle accidents obtained from analysis by way of cross tabulations. The cross tabulation analysis of sex, age and education against respondents who were involved or not in the bicycle accident was necessary because it gave an insight on which demographic factor was significant and needed remedial measures.

Table 2: Socio-Demographic Factors Associated with Bicycle Accidents

Factor	Category	Bicycle accidents		P-Value
		Yes Total=78	No Total=162	
Sex	Female	35.9 (28)	30.2 (49)	0.380
	Male	64.1 (50)	69.8 (113)	
Age (years)	18-24	48.7 (38)	40.7 (66)	0.084
	25-34	48.7 (38)	48.8 (79)	
	35+	2.6 (2)	10.5 (17)	
Education	Secondary	52.6 (41)	75.9 (123)	<0.001
	College or higher	47.4 (37)	24.1 (39)	

(Source: Adapted from Field data, 2014)

3.1.1. Bivariate Analyses of Bicycle Accidents

Table 3 shows the bivariate analyses of socio-demographic factors as independent variables and bicycle accidents as a dependent variable. The interpretation was done statistically as follows: There was an association between demographic characteristics and bicycle accidents. The only difference was that the association of sex Vs Bicycle accidents and age Vs. Bicycle accidents was not significant, while that of education and bicycle accidents was significant (P=0.001).

3.1.2. Bivariate Factors Associated with Bicycle Accidents

Having dealt with social demographic factors in relation with bicycle accidents, Table 3 shows results of bivariate analysis of factors (independent variables) against bicycle accidents (dependent variable).

Table 3: Bivariate data

Factor	Category	Bicycle Accidents		P-Value
		Yes Total=78	No Total=162	
Road signs and road condition	Yes	82.1 (64)	85.8 (139)	0.107
	No	12.8 (10)	5.6 (9)	
	Sometimes	5.1 (4)	8.6 (14)	
Alcohol & drug abuse	Yes	32.1 (25)	24.1 (39)	0.0048
	No	56.4 (44)	43.8 (71)	
	Substandard	7.7 (6)	24.1 (39)	
	Not sure	3.8 (3)	8.0 (13)	
Inadequate law enforcement	Yes	94.9 (74)	63.0 (102)	0.0071
	No	5.1 (4)	27.2 (44)	
	Not sure	0 (0)	9.9 (16)	
Lack of formal bicycle training	Yes	12.8 (10)	17.3 (28)	0.006
	No	75.6 (59)	57.4 (93)	
	Not sure	11.5 (9)	25.3 (41)	
Bicycle defects	Yes	75.6 (59)	13.6 (22)	0.002
	No	15.4 (12)	61.1 (99)	
	Not sure	9.0 (7)	25.3 (41)	
Bicycle helmets	Yes	38.5 (30)	34.6 (56)	0.507
	No	56.2(91)	56.4(44)	
	Not sure	5.1 (4)	9.3 (15)	

(Source: Field Data, 2014)

Table 3 revealed that the following factors are in association with bicycle accidents: lack of law enforcement (P=0.008), Lack of formal bicycle training (P=0.006), alcohol & drug abuse (P=0.048) and bicycle defects (P=0.002). Others were insignificant as shown in the Table 3. The factors which were significant were later subjected to further statistical analysis using multivariate analysis thereby giving the following results.

3.1.3. Multivariate Analysis of bicycle accidents

After conducting bivariate analysis of factors by way of cross tabulations, all those factors that were found to be significant were subjected to multivariate analysis. This involved logistical regression to determine the predictors of bicycle accidents as shown in Table 4.

Table 4: Multivariate Factors associated with Bicycle Accidents

Factor	Category	OR	95% Confidence Interval
Age (years)	18-24	2.15	1.16, 4.00
	25-34	1.91	1.03, 3.52
	35+	1	0.45,0.85
Law enforcement	Yes	2.18	1.18, 4.03
	No	1.48	0.86, 2.53
	Substandard	0.43	0.20, 0.94
	Not sure	1	
Alcohol and drug abuse	Yes	2.15	1.16, 4.00
	No	1.91	1.03, 3.52
	Not sure	1	0.45,0.85
Formal bicycle training	Yes	0.62	0.45,0.85
	No	1	
Bicycle defectiveness	Yes	0.10	0.03, 0.29
	No/not sure	1	

(Source: Adapted From Field Data, 2014)

3.2. Qualitative data

The findings of qualitative data on factors behind Bicycle Accidents in Chipata District were reported thematically in tables starting with the factors responsible for bicycle accidents as shown Table 5.

Table 5: Qualitative data on factors behind Bicycle Accidents in Chipata District

Theme	Response
Defective bicycles	• Respondent twenty three (23) said, ”defective bicycles are one of the leading causes of accidents in Chipata District”. • Respondent twelve (12) argued that “one cause of bicycle accidents is the defectiveness of bicycles such as poor brakes, whereby they use their feet to brake especially at the slope, no bells, but they instead whistle using the mouth.” • Respondent eleven (11) stated that, ‘defective bicycles, poor brakes, bicycles sharing road with vehicles and unlicensed cyclists are responsible for bicycle accidents.’
Lack of certified training in cycling	• Respondent one (1) lamented that, “there is need to teach cyclists rules and regulations regarding public roads which is the reason why there have been many bicycle accidents in Chipata district” • Respondent three (3) agreed with respondent one that, “cyclists should start undergoing certified training like the motorists do, so that they can be exposed to the Highway Code as well”. • Respondent twenty five (25) stated that, “There is need to start testing the cyclists because most of them do not know how to use public roads, this trend leads to accidents.”
Theme	**Response**
Inadequate law enforcement and bicycle inspection	• Respondent one(1) stated that, “the community regard cyclists as very poor people such that each time the enforcement of traffic laws is done and bicycles impounded, pressure mounts on police command from Chiefs, politicians and cyclists themselves to release them” .
Alcohol and Drug Abuse	• Respondent one (1) argued that, ‘’When a cyclist is drunk, he starts to see a nearby person as though he is still far and balancing becomes a problem”. • Respondent eleven (11) emphasized that”, drunkenness impairs judgment and it suppresses the sight. Hence, a cyclist might lose grip on a bicycle if he is intoxicated. • Respondent sixteen(16) said, “poor concentration on roadways is one of the effects of • Respondent twenty two (22) mentioned that, “most cyclists cycled under the influence of alcohol or drugs and that was the reason why there was an increase in the number of accidents involving cyclists in the area” • Respondent 24 mentioned that, “drug and alcohol abuse contributed to bicycle accidents because of lack of concentration and poor judgment.” • Other respondents generally agreed with their fellow respondents while others did not contribute on this issue.

Theme	Response
Political Interference in Traffics Law Enforcement	• Respondent two (2) lamented that, "the cyclists are considered as voters by politicians while chiefs regard them as their subjects as such, politicians and chiefs interfere in police operations in instances where cyclists are impounded, citing victimization and poverty among them." • Respondent six (6) stated that "Attempts to enforce the traffic laws among cyclists always bring conflicts between the police and politicians as well as chiefs".
Road and Traffic Signs and Absence of cycle tracks	• Respondent three (3) argued that, "in the absence of cycle tracks, bicycles.'' • Respondent four (4) stressed that, "cyclists think traffic signs are meant for motorists alone, when vehicles stop, mostly, it's the bicycles that collide with pedestrians at the traffic signs''. • Respondent fifteen (15) said," sharing of the roads with motorists contribute to bicycle accidents in Chipata district." • Respondent twenty one (21) lamented that, "most of the traffic signs are faded in the district, this causes accidents". • Respondent twenty four (24) stated that, "cyclists did not observe the Highway Code in Chipata District because they tended to cycle at the centre of the road, when there was no provision for pedestrians and cyclists to do so.
Theme	**Response**
Bicycles overloading	• Respondent one (1) lamented that, "bicycle overload is real in Chipata District and it is a cause of bicycle accidents in the district. • Respondent one (1) added that, "Since i started my bicycle taxi business, there has not been any one time when the law enforcers have questioned me at the check point, even if I have overloaded my bicycle, I just pass while the overloaded taxi vehicle will be caught." • Respondent nine (9) said, "a cyclist might carry three elderly people on one bicycle to make quick money: a child and a couple (wife and husband) on one bicycle with some luggage on it, such that it becomes overloaded to an extent where he fails to easily stop in case of emergency".
Speed Competition.	• Respondent twelve (12) stated that, "cyclists like overtaking motorists as they compete for customers to make more money, which is practically not workable because if a motorist realizes this, he also speeds to show off to a cyclist. This competition sometimes results in unnecessary accidents''. • Respondent thirteen said," Cyclists do not know how to join the roads, they change sides while speeding". • Majority of the respondents stressed that over-speeding of bicycles was one of the causes of bicycle accidents in Chipata District.
Theme	**Response**
Perceived Corruption	• Respondent two (2) mentioned that," Traffic police and RTSA officers concentrate on vehicles because of corruption; they do not pay attention to motorists". • Respondent eight (8) said, "Corruption was one of the main unethical practices which police and RTSA personnel engage themselves in and was equally contributing to accidents". • Respondent twelve(12) indicated that, "corruption is a bad practice because it puts cyclists at risk of getting involved in accidents, since law enforcers concentrate on vehicles because they get bribes from drivers but a cyclist might not afford what they need, hence, gets endangered by using a defective bicycle."
Use of reflectors	• By law, cyclists were expected to put on reflectors. However, Respondent three (3) mentioned that, "cyclists do not put on reflectors, while others put on dark clothes especially at night the practice which is contrally to the Highway Code and causes accidents." • Respondent twenty one (21) stated that, "cyclists are also supposed to have the blue light at night which the majority of them do not have, this contributes to accidents".
Theme	**Response**
Non-Utilization of Helmets	• Respondent one (1) indicated that, "since i began attending to accident victims, there was no time when I found a cyclist with a helmet at a scene of accident." • Respondent two (2) said, "for our own safety we must start using helmets even before a piece of legislation is not yet enacted because it can help to prevent deaths and serious injuries". • Respondent sixteen (16) indicated that, "there is no piece of legislation in Zambia which compels cyclists to put on helmets." • Respondent eighteen (18) stated that, "there is need for the government to review the high way code to embrace helmet use." • Respondent twenty three (23) indicated that, "there was need to enact a piece of legislation to make usage of helmets compulsory".
Theme	**Response**
Weather	• Respondent seventeen (17) mentioned that, "bad weather also contributes to bicycle accidents in Chipata District especially during the rainy season."
Beliefs Values and Attitudes and tradition	• Respondent seven (7) mentioned that, "In Africa, accidents are also believed to be caused by witchcraft." • Respondent sixteen (16) stressed that, "witchcraft and Satanism were strongly suspected as causes of bicycle accidents". • Respondents two (2) stated that, "Spiritual beliefs regarding the ancestors and the dead not being happy are suspected to be behind fatal bicycle accidents in Chipata district".

	• Respondent twenty one (21) said, "Personal values of cyclists and principles they live with might help them in avoiding accidents." • Respondent seven(7) indicated that, "if a person values his life, he has personal care, then he would mind what he does on the roads" • Respondent twelve (12) remarked that, "negative attitudes that some cyclists hold toward other road users influence their conduct on the roads."

(Source: Field data, 2014)

4. Recommendations

Based on the findings, the following recommendations were proposed for consideration: Road Transport and Safety Agency (RTSA) to introduce compulsory use of bicycle helmets, cycle lights and reflectors for cyclists. Road Development Agency (RDA) to introduce mandatory cycle tracks for all public roads. Zama Environmental management Agency (ZEMA) to conduct capacity building among RTSA and police officers on Environmental Education. Traffic police and RTSA officers to scale up Law Enforcement among Chipata cyclists. RTSA to conduct awareness campaigns among cyclists on causes of bicycle accidents. RTSA to introduce bicycle certifying training institutions, bicycle fitness tests, number plates and a data base for easy bicycle tracking. Police training schools to include in the curriculum Environmental Education as a complementary strategy in addressing bicycle accidents. Zambian Government to establish a unit within Zambia Police Service and RTSA to offer Environmental Education in line with the Policy on Environment. RTSA to translate the Traffic Highway Code into Local Languages such as Chewa and Ngoni.

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