**MARTIN MWANGI**

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**RESEARCH METHODOLOGY**

## **Introduction**

This chapter covers in detail the explanation of the procedure used in undertaking the research. This study, which was an historical research, used the mixed mode research approach. Qualitative as well as quantitative researches were used to explain the relationships analyzed in the study. In qualitative research, the fundamental concern was the degree of confidence in the data used to reach conclusions. Perspectives of the researcher were checked using triangulation, i.e. by considering different instruments for enhancement of validity. Specifically, various theories on behavior and attitude were analysed with respect to the driver. Further, the data set available for the period of the study was checked for consistency, accuracy and validity using the Spearman-Brown formula. The chapter further gives in detail the research design, target population and its relationship to the sample used, treatment of sampling errors, data collection procedures, analysis and hypotheses testing.

**Research Approach**

The study was conducted along Kenyan busy highway to be precise Thika Superhighway . The choice of Thika Superhighway was informed by the realization it was the only Superhighway in Kenya by the time the study was conducted. The Superhighway was constructed to improve the road transport and reduce accidents. However, more accidents continue to happen despite the construction. This called for the need to carry out a study to determine the causes of rising number of traffic road accidents along the Superhighway.

**Design**

Firstly, the study applied the linear correlational research analysis method for determining the relationship between driver behaviour (independent variable), and road traffic accidents (dependent variable). Secondly, descriptive statistics and two theories were used to explain the various causes of road traffic accidents. Driver behavior as a variable would not have been measurable, thus it was necessary to device a method to 51 measure the same. Road traffic accidents in the data set availed from the police were classified into various categories specific to their causes and presented in codes.The number of road traffic accidents recorded as being caused by the driver was assumed to be related to the behaviour of the driver. This assumption is based on the premise that human factors contribute in 95 percent of accidents in urban areas, (The Institution of Highways and Transport, 1997). The data used helped to inform the research on understanding the main causes of road traffic accidents. The study was further used to guide in understanding the various options that could be implemented to reduce road traffic accidents in the City of Nairobi. The study involved the studying, recording and analyzing past data in historical perspectives (United Nations Centre for Regional Development, 2004). Choice of the type of study used was dependent on the knowledge already available about the problem and the resources available, as well as the limited time to carry out the study and the budgetary constraint.

**Target Population**

The target population was the number of all traffic accidents occurring in the City of Nairobi during the period 1st January 2005 to 30lh June 2008. Not all the accidents for that period, however, have been recorded in the City Council of Nairobi’s database. In that respect, this population was not available. The accessible population considered in the study, therefore, was the total number of accidents occurring in the City’s jurisdictional area for the study period, as recorded by the traffic police. While appreciating the 52 proximity of police stations to the main roads and fear o f reprisals for motorists for not reporting traffic accidents as required by law as motivation to record road traffic accidents, studies show that underreporting of road traffic accident data is an international phenomenon. Reporting of accidents in developing countries is known to be low due to various shortcomings. (Djebami and Naji. 1999).

**Sampling Design**

Whether or not a sample will produce results that are sufficiently representative of the whole aggregate depends primarily on whether the errors introduced by the sampling process are sufficiently negligible to the extent that they cannot invalidate the results for the purposes for which they are required. In order to reduce the sampling errors, a sufficiently large sample size needs to be used, (United Nations Centre for Regional Development, Africa Office (UNCRD), 2004). Using the rule of thumb and consideration of the target population, the data available from police records for the entire period of the study was used as the sample, constituting approximately 60% of the population as noted above. The sample for the study therefore used the non-probability sampling procedure and the sample is a purposive one. In this kind of sampling, the judgement of the researcher played an important role to ensure that bias was either minimized or eliminated (Kothari. 2004). The researcher’s assumptions when using the sample size took into consideration the budget, time, personnel and other limitations, (Barlett. Kotrlik, and Higgins, 2001).

**Data collection methods**

Data collection method was mainly quantitative, with the strategy being the application of record-keeping and studying the causes of road traffic accidents occurring in the city of Nairobi with the aim of carrying out an analysis for the purpose o f making recommendations. Owing to time limitations, financial resources at the disposal of the researcher, methodology of collection and the precision required in the study, it was not feasible to collect primary data.

The data to be used in the study therefore is secondary data collected from the City Council of Nairobi, which collaborates with the Traffic Police Department in matters relating to road traffic accidents within the jurisdiction of the City Council. City Council officials collect data from the traffic police in its raw 56 form, compiled in standard forms (archive source accident data), thus qualifying the council to be considered a primary source. While all care was taken in handling the data, incidents of biases like over-reporting and selective under-reporting, particularly in self-reported accidents may have gone undetected.

Three classes of injury severity were recorded namely: slight injury; serious injury; and fatal injury. The police forms used for recording the information indicate the following labels: year, month, region, police jurisdiction, identity of the police officer, vehicle type, manner of collision, age bracket of victims, accident cause code, time of day, and the output injury severity. Traffic police carry out the exercise o f data collection through reports from victims, eye witness reports, observation while on road patrols, telephone and radio communication.

**Validation and reliability-qualitative mixed**

Validity is the degree to which results obtained from the analysis of the data collected in a study actually represents the phenomenon under study and also validity is the extent to which information collected by the researcher truly reflects the phenomenon being studied (Mugenda & Mugenda, 2003; Veal &Darcy, 2012). To ensure the validity of the instruments simple language was adopted to avoid ambiguity in an effort to promote the accurate responses by the respondents. The supervisor’s expert opinion was sought regarding the validity of the research instruments.

The questionnaires were subjected to pilot test using the test retest method. In order to ensure their reliability, questionnaires (drivers, passengers, and pedestrians) were piloted at Kangemi – Limuru road dual carriageway.

**Data analysis**

The data described above are time-related in that they have been collected on daily basis over a period of time. For that matter, the analysis of the data could have been the method of time series. However, there were several variables in the study, and thus bringing in a different dimension to the analysis. In this regard therefore, the analysis of the data was based on both simple descriptive statistics and elaborate associative techniques, i.e. linear correlation. The simple statistics were restricted to the frequency in which the road traffic accidents occurred over the period of the study. The associative techniques applied linear correlation, which aimed at investigating whether there existed a relationship or association between driver behaviour (measured numerically by the number o f driver-related road traffic accidents) and the total road traffic accidents. According to Lucey, (2002), when the value o f one variable is related to another, they are said to be correlated.

The analysis aimed at determining the Pearson Product Moment Correlation Coefficient denoted by r, which gives an indication of the strength of the linear relationship between two variables.

The quantity r is defined as:

r = (Equation 3-1) 55

where \ and v the number of driver-related and n is the sample size. accidents and total accidents, respectively,

It is a fact that, all other factors being held constant, a bigger sample will probably be more reliable than a smaller one. The Spearman-Brown prophecy formula was developed to estimate the change in reliability for different numbers o f items.

The Spearman’s p (Rho) is the measure o f reliability is defined in equation 3-2 as:

reliability = n x r 1 + (n - l ) r (Equation 3-2)

where n is the sample size and r the Pearson Product Moment Correlation Coefficient.

Further, the driver-related accidents were analyzed with respect to each cause code to determine which among the thirty three causes associated with the driver were the main causes of road traffic accidents.

**Ethical issues**

It was established important to adhere to the ethics during and after data collection. Permission was sought from National Commission of Science, Technology, and Innovation (NACOSTI), National Police Service and Kenyatta University. A consultation was done between traffic police department, Ministry of Infrastructure and Transport and NTSA on the methodology and the purpose of the study. A briefing on data collection was done to ensure participants were aware of what was expected of them. A self-administered questionnaire was administered to the respondents with the help of research assistant at their workplace for the respondents to fill. Face to face interviews with the senior traffic police officer, personnel of the Ministry of Transport and NTSA were conducted by the 23 researcher at convenient places. Confidentiality of the respondents was maintained where no names or employment numbers were recorded, in case of the traffic police officers

**Summary of the chapter.**

From the descriptive statistics it was observed that the main causes of road traffic accidents are factors that have something to do with the driver. Of particular interest in the study is drunk-driving. While not appearing as one of the main causes of road traffic accidents, driving 'under the influence of drink or drug was also analysed to interrogate/illustrate the incompleteness of road traffic accident records as a result of lack of relevant/appropriate legislation to facilitate reining in drunk drivers.