# POST TRAUMATIC STRESS DISORDER AMONG AUTOMOBILE AND MOTORCYCLE ACCIDENT SURVIVORS ATTENDING THE ORTHOPAEDIC CLINIC IN KNH: A COMPARATIVE STUDY

**A RESEARCH CARRIED OUT IN PART FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTERS DEGREE IN PSYCHIATRY AT THE UNIVERSITY OF NAIROBI**

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I, Dr.  Ruth Njeri Gathuru, do hereby declare that this research is my own work and that I have not presented it to any other institution of learning for a degree award.

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Date……

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## DEFINITION OF OPERATIONAL TERMS

**Automobile**: Three, four or more-wheeler motored vehicle. These include personal cars, public service vehicles and goods-transporting-vehicles.

**Motorcycle**: two-wheeler motored vehicle.

**Motor vehicle**: two, three or more-wheeler motored vehicle. These include motor cycles and automobiles.

**Motorcycle accident survivors**: those who were on the motorcycle and those hit by motorcycle if pedestrians

**Automobile accident survivors**: those who were in the automobile and those hit by automobiles if pedestrians.

**Road traffic accident**: used interchangeably with motor vehicle accident

**Victims**: used interchangeably with survivors.

## ABBREVIATIONS

**PTSD**: Post Traumatic Stress Disorder

**MVA**: Motor vehicle accident

**RTA**: Road traffic accident

**UoN**: University of Nairobi

**IES**: Impact of Event Scale

**IES-R**: Impact of Event Scale-Revised

**PCL**: PTSD check list

**ABSTRACT**

The problem of road traffic accidents is increasingly becoming a threat to public health and national development in many developing countries. Apart from inflicting physical injuries to the survivors, motor vehicle accidents have been found to be a principle cause of Post Traumatic Stress Disorder, often with enduring symptomatology.

**OBJECTIVE**

This study aimed at elucidating any differences in PTSD between the survivors of motorcycle and automobile accidents.

**STUDY DESIGN**

The study employed a comparative cross-sectional design

**STUDY POPULATION**

The study was conducted among motorcycle and automobile accident survivors attending the Orthopedic clinic at Kenyatta National hospital.

**METHOD**

Data was collected using a self-administered socio-demographic and Impact of Event Scale –Revised questionnaire. Descriptive and inferential data analysis were done using SSPS version 21.

**RESULTS**

Two hundred and thirty four(234) patients were purposively recruited for the study. Of these motorcycle accident survivors were 114 while automobile accident survivors were 120.The mean age for MCA survivors was 37.67(SD 11.85) while that of AMA survivors was 36.08(SD 12.44).The mean of the total was 36.85(SD 12.16).Males accounted for 69% of the total(n=161.PTSD prevalence among MCA survivors was 56.1% while that of the AMA survivors was 64.5% The total mean IES-R score was 35(18).The total mean scores for the Intrusion, Avoidance and Hyperarousal subscales were 1.7,1.6 and 1.6(SD 0.9,0.9.1.0) respectfully. Mean age of those who had PTSD was 35.89 years (SD 11.2). Bivariate analysis showed occupation, level of income, hip fracture and history of previous accident to be associated with PTSD. Multivariate analysis showed that adjusting

for occupation and income level, absence of hip fracture, history of previous accident and having an automobile accident were associated with increased risk of PTSD.

## CONCLUSION

PTSD is prevalent among motor vehicle accident survivors. Patients of automobile accident are 2.5 times more likely to have PTSD than those of motorcycle accidents.

## RECOMMENDATIONS

Routine screening for PTSD for all motor vehicle accident victims and treatment of the affected patients needs to be introduced in all trauma centres. Public education on psycho trauma should be initiated.

## CHAPTER 1

### 1.1: INTRODUCTION

The problem of road traffic accidents is increasingly becoming a threat to public health and national development in many developing countries.

WHO strategy of 2001 reports that currently road traffic accidents are the leading cause of death and injuries, the 10th leading cause of all deaths and the 9th leading contributor to the burden of disease worldwide based on disability adjusted life years. It is projected to be 3rdworldwide and 2nd in developing countries in DALYS in the year 2020.Road and Traffic Authority Statistical Report showed that the number of accidents per registered vehicles was 10 to 20% higher in developing countries than in the developed world.(Pierce and Maunder,1998).

Apart from inflicting physical injuries to the survivors, motor vehicle accidents have been found to be a principal cause of Post Traumatic Stress Disorder, often with enduring symptomatology.

Post traumatic disorder (PTSD) is a potentially debilitating anxiety disorder that includes avoidant behaviour, intrusive memories of trauma and heightened arousal. It is a psychiatric condition which develops after a person is exposed to one or more traumatic events such as sexual assault, serious injury or the threat of death.

According to DSM-IV-TR,(APA,2000),a person with PTSD has experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or a threat to the physical integrity of self or others or the persons response involved intense fear, helplessness, or horror. The traumatic event must be persistently re-experienced; with persistent avoidance of stimuli associated with the trauma, numbing of general responsiveness and persistence of symptoms of increased arousal. The duration of disturbance must be more than one month and the disturbance must cause clinically significant distress or impairments in functioning.

The condition is termed acute if duration of symptoms is less than three months, chronic if three months or more and with delayed onset if symptoms last at least six months after the stressor.

With more than 50 million people reported in 2007 to be injured each year in road traffic accidents worldwide (Derriks and Mark,2007),motor vehicle accidents are indeed contributing highly to burden of disease.

Various studies on PTSD and injury have been conducted on people involved in road traffic accidents. However, researchers have not compared PTSD and injury amongst the different modes of transport. Knowledge of the same may significantly influence policy making in terms of prioritization and allocation of resources.

In Kenya, in addition to the usual motor-vehicles seen on our roads, there is also a recent upsurge of motor-cycles as an important means of transport. Upward has gone the number of registered motorcycles in Kenya and this has come with a rise of motorcycle accidents. It is in this light the researcher compares PTSD following motorcycle and automobile accidents

**1.2: BACKGROUND**

According to WHO, road traffic injuries caused an estimated 1.2 million deaths worldwide in the year 2010.Of these 92% occurred in low and middle income countries with South-East Asia and Africa having the highest rates.

Motorvehicle accidents burden nations heavily in terms of economic costs. The global economic cost of motor vehicle injuries was estimated at $518 billion per year in 2003 with $100 billion of that occurring in developing countries (World Road Traffic Injury prevention, WHO).

According to the National Traffic Accident Statistics report, there has been a steady decline in the total number of accidents in Kenya from the year 2005.However that trend has now changed as the number is seen to be rising from the year 2010.

In 2002,in an effort to promote alternate and cheaper means of transport, the Kenya Government waived import duty on bicycles and motorcycles. Importers drastically lowered prices to a 50% drop and financial institutions have now joined in to give

affordable credit facilities on boda bodas, a common term used to refer to taxi motorcycles. This has resulted to an influx of registered motorcycles on the Kenyan roads.

Between 2005 and 2009, the motorcycle registration increased to a record 91,151 from about 3,759 ,(Economic Survey,2010).According to traffic reports, this is the same period that recorded a rise in accidents of 36%.Going by a report on the Daily Nation, on 5th November,2013,the cost of motor vehicles is expected to go down as a local motorcycle assembly point is set up targeting to produce 130 units per day. The use of the transport mode is subsequently expected to increase even further.

Motorcycles have been in Kenya since the 1960s when they were commonly used to transport people and smuggled goods across the Kenya-Uganda border- to border; giving them the nick name boda boda.

The boda bodas provide an affordable mobility option that is not otherwise available. They provide door to door mobility, unmatched navigability in congested road conditions, ease of parking and capacity for passengers and luggage at low cost.

With the recent escalation of petroleum prices, use of motorcycles is growing.

The increase of boda bodas has resulted in an increase in motorcycle related crash incidents. This has been attributed to, among other factors, inadequate training, overloading, over speeding, poor regulation and law enforcement.

It is reported that in fact some hospitals in Kenya have set aside separate wards for the motorcycle accident victims. Among these are Kitale, Kapsabet, Kakamega, Eldoret referral, Kijabe, and the Malindi hospitals. The situation is similar in some other African countries too.

In a feature on the Sunday express, June17, 2012-June 23,2012 entitled “Boda boda accident victims jam orthopaedic wards in the country”, it was reported that at the National orthopaedic hospital Igbobi-Lagos, Nigeria, there is a ward called “Okada ward” wholly devoted to patients involved in motorcycle accidents.

In a study conducted on boda boda business in Uganda, it was found that 75% of all trauma cases of the national referral hospital are as a result of boda boda accidents. The hospital receives between 5 and 20 boda boda accident cases daily.

In a study done in Ghana on the growing use of motorcycles for commercial transport and traffic safety, it was found that the illegal operation of motorcycle business is increasing at a rate of about 100 times that of conventional vehicular commercial transport. More than 50% of the operators had been involved in traffic crashes and 80% more than once. Fatality rate was found to be about 10% and injury rate 77.6% with maiming of victims. (Agyekum-Boamah,2012).

Motorcyclists are indeed a group of people in risk of PTSD following road accidents and would certainly require adequate psychological interventions.

Automobiles are still the leading cause of motor vehicular accidents. This is so given their large numbers compared to motorcycles. They have been found to contribute significant levels of PTSD risk to their victims. Motorcycle accidents, however, are noted to be more serious and assumed to pose more PTSD risk for the following reasons:

-The occupants are usually exposed

-Being a two wheeler, it is not as stable as the four or more- wheeler

-The motorcycles do not protect their passengers with seat belts, roll bars, air bags as in the case of the motor cars. Motorcyclists are 35 times more likely to experience a deadly accident on the road than those in motorcars and do suffer severe stress following road traffic accidents.

Various studies on PTSD and injury have been carried out on people involved in motor vehicle accidents including motorcycles and significant rates have been found(Blanchard et al,2004;Koren et al,1999;Ehler et al,1998,Ongecha –Owuor et al,2004).
The good news is that not all that are involved in motor vehicle accidents actually develop PTSD but a significant minority.

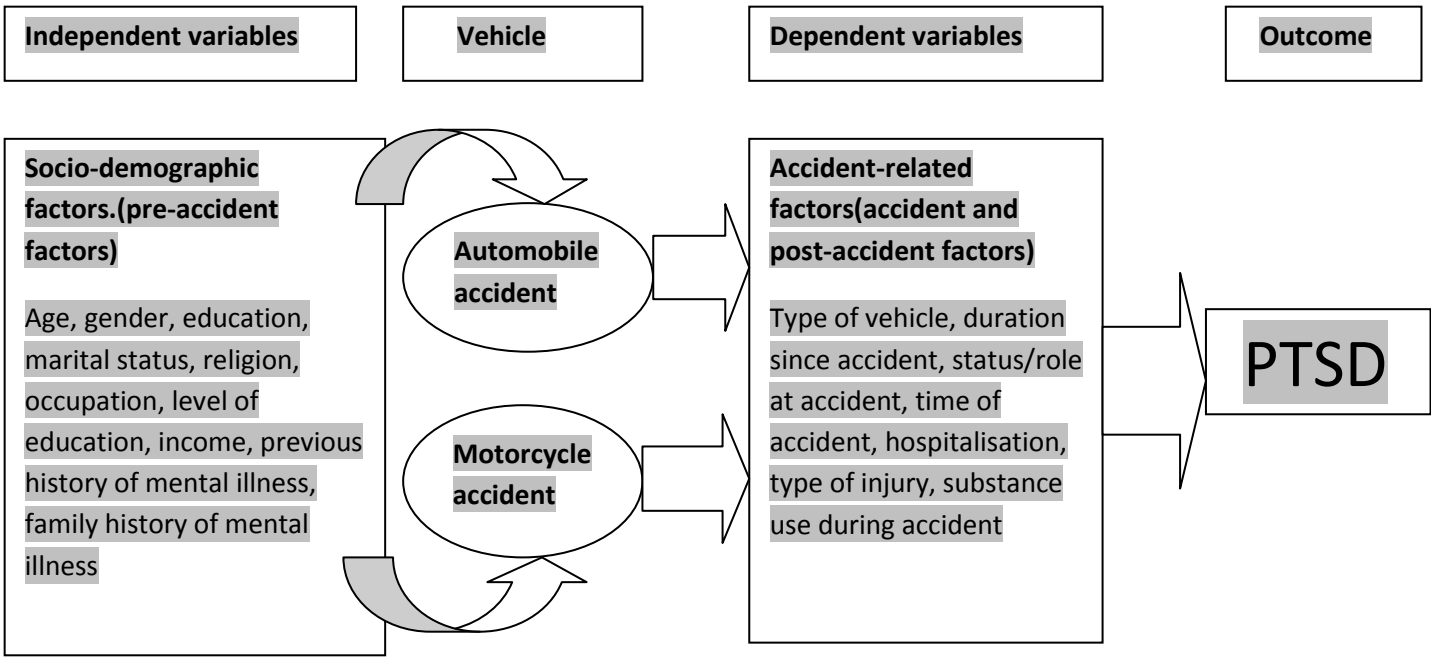
There are factors that have been identified to predict PTSD. Among these are pre-accident and accident factors. Pre-accident factors including socio-demographic factors such as age, gender ,socio-economic factors, previous psychiatric illness, previous road traffic accidents are factors that influence PTSD development(Ongecha-Awuor,2004;Blanchard etal,1995;Kupchik et al,2007,Iteke et al,2011).Accident factors including perceived responsibility of accident also do influence development of PTSD in the survivors.

Blaming others for the accident has been associated with higher levels of psychological distress for both passenger and driver(Ho et al,2002).

PTSD can have devastating social and economic costs. These include disruption to families and relationships, domestic violence, work absenteeism and health care costs(Greenberg et al,1999).The disorder can also be associated with higher psychiatric co-morbidity, attempted suicide and physical illnesses such as asthma, hypertension and peptic ulcers(Davidson et al,1991).

## 1.3: CONCEPTUAL FRAMEWORK-PTSD AND ASSOCIATED FACTORS

**Figure 1: Framework of PTSD and associated factors - (Adapted from Blanchard & Hickling,1998; After the crash)**




## 1.4: STATEMENT OF THE PROBLEM

Where primary prevention of PTSD following MVAs has not been achieved, there is need for secondary prevention to accelerate recovery and decrease the severity of traumatic stress reactions among the survivors of automobile and motorcycle accidents.(Megan,2012).

Motorcycle and automobile accident survivors do develop significant rates of PTSD. Psychological welfare of the persons has largely been ignored as health care professionals concentrate more on managing the physical injuries. If their physical and psychological needs are to be addressed, there is need to have a multi-disciplinary approach in handling the cases.(Ongecha-Owuor et al,2004).

With the number of motorvehicle accidents increasing in Kenya yearly, and significantly so of motorcycles, failure to address the problem of PTSD in these groups of survivors will result to an increase of disability and higher economic costs to the country.

## 1.5: STUDY OBJECTIVES

**Main objective**: To compare the prevalence of PTSD and associated factors in automobile and motorcycle accident survivors attending the orthopaedic clinic at KNH.

**Specific objectives**

1. To compare prevalence of PTSD among the automobile and motorcycle accident survivors
2. To determine the association of PTSD and socio-demographic factors among the automobile and motorcycle accident survivors
3. To determine the association of PTSD and accident-related factors among the automobile and motorcycle accident survivors.

## 1.6:HYPOTHESIS

The prevalence of PTSD among automobile accident survivors is higher than that of motorcycle accident survivors.

## 1.7: JUSTIFICATION OF THE STUDY

Injuries and harm to health caused by motor vehicle accidents have become an issue of global concern. According to previous studies, motor vehicle accident survivors indeed do develop significant rates of PTSD.

In the Kenyan study conducted about 10 years ago in the same study site and similar population,(Ongecha-Owuor,2004),it was found that PTSD prevalence was 13.3%.Since that period a lot has changed including a rapid entry of motorcycles on the Kenyan roads and subsequently an increase in road accidents.

There is need to find out if there exists any difference in prevalence of PTSD among accident survivors of the different modes of transport; in this case automobiles and motorcycles being common modes of transport in Kenya.

The findings from this study are aimed at adding knowledge and more understanding of the impact of motor vehicle accidents on the psychological wellbeing of the accident survivors.

These would go a long way in influencing policy making in both the health care delivery systems and the road safety sectors.

Quite importantly too, the study findings will be useful as baseline data in future related studies.

## CHAPTER 2:

## LITERATURE REVIEW

PTSD among motor vehicle accidents is a subject that has drawn a lot of attention to researchers worldwide. Researchers have concentrated on motor vehicles in general without having to study individual vehicle types.

However, despite this gap in information, the researchers have established there exists significant rates of PTSD among the accident survivors.

## INTERNATIONAL PERSPECTIVE

## PTSD AND MOTOR VEHICLES:

### PREVALENCE

A wide range of PTSD prevalence among motor vehicle accident victims has been established. Blanchard et al estimated that between 15 and 45% of motor vehicle accident survivors develop PTSD within the 1$^{st}$ year of the accident (Blanchard et al, 2004).

In his study, 98 victims of recent motor vehicle accident were followed up for PTSD symptoms 6 months after the initial assessment. Fourty patients met full criteria for PTSD initially. Of the 40,30 met the full criteria 4 months down the line and at 6 months 20 met the criteria(Blanchard et al,1995).

In the United Kingdom, Oxford, Ehler et al did a follow up of motor vehicle accident survivors attending the emergency unit at 3months and at one year. Out of the 865 patients followed up,23% had PTSD at 3 months, while at one year,17% of them had PTSD,(Ehler et al,1998).

In a different study in the U.K., Mayou studied 188 ER attendees and using the Present State Examination(PSE),14(8%) out of 174 met DSM -111 criteria for PTSD 3 months later and 13(7.6%) at one year.

Psychological complication following MVA can be persistent.

A follow up study of the original Mayou et al sample was carried out after 5 years on 111 (59%) participants of the original study.Nine cases(8.1%) were found to have PTSD and 10 others had 'minor' PTSD.

In a study on frequency and impact of different potentially traumatic events on different demographic groups, Norris found that 12% of MVA survivors experienced full PTSD(Norris F.,1992).

In their study of predictive factors for acute stress disorder and PTSD after motorvehicle accidents,95 participants who had injuries from traffic accidents were evaluated at 4 different times. It was found that at 3,6 and 12 months after the accident, PTSD affected 29.8,23.1 and 17.1 of the participants respectively(Guzel, et al,2009).This is quite a high prevalence rate in comparison with other studies. It has been observed that the differences in PTSD prevalence varies depending on the methodology and population of study.

**ACCIDENT-RELATED PTSD RISK FACTORS**

Research has revealed that motor vehicle injuries can result in severe and debilitating psychological distress. Yet not every person who has sustained a motor vehicle injury suffers psychologically. Certain factors have been found to predict PTSD development amongst the subjects.

Socio-demographic and accident factors are significant factors widely studied.
However, despite several studies, there are conflicting findings relating to risk factors and predictors of PTSD. No clear demographic factors have been established for PTSD.(Kupchik et al,2009).

According to Blanchard et al,1994,"Each person brings individual risk factors and vulnerabilities and each accident then has its unique traumatic aspects that interact with the variable perception of every person involved in the accident. The survivors then struggle to cope with the traumatic event and its after effects; while attempting to make some kind of sense of what has happened to them".(Blanchard et al,1994).
There are multiple factors that impact upon whether or not an individual will develop PTSD after a motor-vehicle accident.

Blanchard & Hickling described risk factors for post traumatic stress as:-a)pre-accident factors which are the characteristics about the driver comprising of socio-demographics:-,b)accident factors which are appraisal and characteristics of the accident and:-,c)post accident factors such as coping styles and social support.(Blanchard and Hickling,1998).

In a Canadian study on the impact of motor vehicle injury(mvi), it was found that men suffered more overall distress than women, those with partners experienced less distress than the un partnered and the link between pre-mvi alcohol and post-mvi distress varied with pre-mvi distress and that pre-mvi distress predicted post-mvi distress.

In a community study on demographic and clinical characteristics of sixty motor vehicle accidents victims, a comparison was made for PTSD and non-PTSD subjects. In this study, no gender differences in the rates of PTSD were noted. Pre-morbid psychiatric illness, previous MVA were not associated with the development of PTSD. These observations are somewhat atypical for studies of individuals with PTSD, probably because this was a community based population rather than a hospital-based one Blanchard et al and Harvey and Briant in their studies of PTSD and motor vehicles, found that previous history of psychiatric morbidity was a significant pre-morbid factor for PTSD following MVAs(Blanchard et al,1995,Harvey and Briant,1999).Harvey and Briant also found history of previous MVAs as significant predictor of post MVA PTSD. In this study, MVA injury severity did not predict PTSD development.

According to Barton, Blanchard and Hickling, the experience of previous psychopathology could have left the individual in a vulnerable state which contributed to the development of acute stress disorder, which would lead to PTSD (Barton, Blanchard and Hickling,1996).

In another study, predictive factors of chronic PTSD six months after a road traffic accident were studied using a prospective cohort .Using a PCL Checklist to evaluate PTSD, risk factors for PTSD after a road traffic accident were identified Findings were that injury severity and feelings of not being responsible for the accident were predictive of PTSD (Chossegros et al,2011).

Jeavons suggested that it is an individuals personal experience and coping style rather than accident characteristics or demographic variables that determine later development of traumatic reactions(Jeavons 2000).

In a study of the role of attribution of trauma responsibility in PTSD following MVA, 165 people participated in the study. In this study, external attribution drivers were significantly more likely to have PTSD than internal attribution ones.
In addition participants who had been involved in an MVA where a serious injury had been sustained were 3 times more likely to have a diagnosis of PTSD.(Nickerson et al,2013).

PTSD following MVA often co-occurs with other psychiatric disorders including depression and anxiety. In an Israeli study of 99 MVA survivors, PTSD was found in 32% of them and 65% of these were found to have a co-morbid condition.Fourty-five point eight had mood disorder and 20.8% had anxiety disorder. The study concluded that there's likelihood of co-morbid diagnoses between PTSD and non-PTSD subjects (Koren et al,1999).

Blanchard et al, in their study of chronic PTSD co-morbidity among MVA survivors, found 53% of them to have major depression,62-68% any mood disorder,26% Generalised Anxiety Disorder( GAD) and 42% anxiety disorder. Motor-vehicle accident victims have become an important subset of individuals in significant need for mental health services.

**AFRICA**

Minimal research on PTSD in motor vehicle accident survivors has been done in Africa.
No study has been done to compare PTSD among accident survivors of different vehicles.

Seemingly, the subject of PTSD is a new concept in Africa.
In contrast to the Western view of PTSD where the traumatic event is blamed for the physiological and psychological consequences that arise, and that the victim is innocent, the development of PTSD was found to be commonly attributed to a weakness in the individual. This was found in a study done in some African countries.(Jennifer A.

Dawson,2007).This view has existed despite the recognition of PTSD as a distinct psychological disorder in the DSM in 1980.

In a study done in South Africa on trauma and PTSD in a primary care population, 201 participants were studied. Among these, 94% reported exposure to traumatic events. In the study, subjects were directly interviewed using translated, standardised instruments to assess variables.

PTSD was found in 19.9% of the subjects. The disorder was found to be associated with poverty and single status and both sexes were equally likely to develop PTSD. Co-morbidity with PTSD was found to be high.

As it was noted in the study by Dawson, concerning low emphasis on PTSD in African countries, the attendant clinicians did not identify trauma psychopathology and psychotropic medication was prescribed for only 1% of participants(Dawson,2007).
A controlled study on road traffic accidents and PTSD was done in an orthopaedic setting in South-eastern Nigeria.

The study included 150 road traffic accident victims and 2 control groups each with 150 subjects.
The prevalence of PTSD among RTA victims and the two groups were 26.7% and 8.7% respectively. The difference was statistically significant.
In this study, females were more likely to suffer PTSD, being gainfully employed prior to the accident had increased likelihood of PTSD and was statistically significant. (Iteke et al, 2011).

A descriptive cross-sectional study on prevalence of PTSD among outpatients attending a Neuropsychiatric hospital in Northern Nigeria was carried out on 256 subjects. Out of them, 51% were males and 49% females. The Post Traumatic Stress Disorder Check List was used to check the prevalence of PTSD. Of the 250 respondents,70 (28%) developed PTSD. In this study, more women than men (57.1%) developed PTSD (Makput et al, 2011).

**KENYA**

Several studies on PTSD have been done in Kenya. However, only one study has been done on PTSD among motor vehicle accident survivors.

As in Africa, no study has so far been done in Kenya to compare PTSD among motorcycle and other vehicle accident survivors.

Ongecha-Owuor et al did a study on PTSD among motor vehicle accident survivors attending the orthopaedic and trauma clinic at Kenyatta National Hospital, Nairobi. In the study of 264 patients, the prevalence rate of PTSD and associated factors among motor vehicle accident survivors attending the Orthopaedic and trauma clinic at KNH were determined. Overall, the prevalence of PTSD was 13.3%.Females had higher rates (17.9%) compared to males. Majority of the ones with PTSD were young. Other risk factors were found to be having post primary education, experiencing the first motor vehicle accident and previous psychiatry illness.

In their study, the type of accident, role/status and immediate reactions to the accident were found not to be significant.(Ongecha-Owuor,2004).

The PTSD can be compared with other studies done on other different groups of trauma survivors. One such study was done on Mau Mau war veterans by Atwoli et al. In their study of 181 war veterans a DSM-IV-TR diagnosis of current PTSD was made in 65.7% of the survivors. In this study, current PTSD was associated with older age unlike Ongecha-Owuor study. It was associated also with lower income, non-catholic religion, large household size, experiencing other traumatic events, family history of mental illness and having other psychiatric illness. Gender, current marital status and level of education had no association with PTSD ($p>0.05$).(Atwoli, et al,2006).

Another study investigated sexually abused females attending Nairobi Womens Hospital. A cross-sectional study on psychiatric morbidity was carried out on 116 females who were 18 years and above, using a socio-demographic questionnaire and the Impact of Event Scale, IES-R. According to DSM-IV diagnosis, most of the sexually abused survivors suffered from Acute Stress Disorder (ASD),and PTSD more than the other psychiatric morbidity;39.2% and 33.8% respectfully (Onyancha-Nyambuto,2004).

The differences in PTSD prevalence rates in the above studies compared to the one on MVAs could be accounted for by the differences in the nature of trauma sustained by the survivors.

## CHAPTER 3:

## METHODOLOGY

### STUDY DESIGN:

A comparative cross-sectional study

### STUDY SITE:

The study was carried out in Kenyatta National Hospital (KNH).KNH is the national referral hospital in Kenya, located in Nairobi, the capital city of Kenya. It has inpatient and outpatient facilities and caters for patients around Nairobi area which is largely cosmopolitan, and also for patients referred from other hospitals countrywide and even beyond.

### STUDY POPULATION:

The study was conducted among orthopaedic patients seen at the orthopaedic outpatient clinic. The clinic operates daily from Monday to Friday and it caters for among other orthopaedic cases, patients who are on follow up following road traffic accidents. The majority of patients seen there have fractures and about 50% of them are as a result of motor vehicle accidents. Among the automobile accident survivors attending the clinic are motorcycle accident survivors.

### SAMPLE SIZE CALCULATION

$$n = \frac{(Z_\alpha + Z_\beta)^2 \times 2 \times \bar{p}(1-\bar{p})}{(p_1 - p_2)^2}$$ (Kirkwood & Sterne; Essential Medical Statistics).

n = sample size per study arm (mode of transportation)

$p_1$ = PTSD prevalence among motorbike accident survivors

$p_2$ = PTSD prevalence among automobile accident survivors

$\bar{p}$ = average PTSD prevalence in two groups of casualties

$Z_\alpha$ = 1.96 (Z statistic representing 95% CI)

$Z_\beta$ = 0.84 (80% power)

$$n = \frac{(1.96+0.84)^2 \times 2 \times 0.208 \times 0.792}{(0.283-0.133)^2}$$

n = 114 participants per group

Total sample size was 234 participants; 114 motorcycle accident survivors and 120 automobile accident survivors.

Assumptions: PTSD prevalence rate of automobile accident survivors(p2) was estimated at 13.3% which was the overall motor vehicle accident PTSD rate at the orthopaedic clinic, KNH (Ongecha-Owuor et al,2004);PTSD prevalence among motorcycle accident survivors (p1) is higher than PTSD prevalence among automobile accident survivors and by about twice for a clinically significant difference.

**SAMPLING METHOD:**

This was purposive. All consecutive patients attending the clinic who met the inclusion criteria and who gave an informed consent were included in the study until the sample size was met.

**INCLUSION CRITERIA**

1. Patients involved in automobile and motorcycle accidents not less than one month before the study
2. Patients above 18 years of age

**EXCLUSION CRITERIA**

1. Patients attending clinic for reasons other than road traffic accident-related
2. Patients below 18 years of age
3. Patients who don't give signed informed consent

**STUDY INSTRUMENTS**

Data was collected using a questionnaire which consisted of 3 parts.

1st part covered socio demographic variables such as age, gender.

2nd part covered variables related to the accident such as time of accident

3rd part was the self-rating Impact of Event Scale-Revised (IES-R) Scale.

IES-R is a standardised measure of PTSD symptoms. It is a 22-item scale with 3 subscales namely Avoidance (8 items), Hyper arousal (6 items) and Re-experiencing (8 items) which correspond to the DSM-IV symptom criteria for PTSD. It is a self-rating tool instrument where respondents rate on a 5 point Likert Scale from 0 (Not at all) to 4 (extremely) how affected they felt by the traumatic event during the preceding 7 days. It ranges from 0 to 88 points.

IES-R was developed in 1997 by Daniel et al from the former Horowitz IES scale. The IES had become an important measurement tool and one of the most widely used self-report measures within the trauma literature.
The IES-R has now been adopted as a measure of traumatic stress in studies. It has been translated into several languages including Japanese, Spanish, German, Chinese and French.

Studies on the psychometric properties of the scale have been conducted. One such study was done on motor vehicle accident survivors and examined the factor structure, internal consistency, concurrent validity, the influence of social desirability and discriminative validity. Results supported the three-factor structure of the IES-R; Intrusion, Avoidance and Hyper arousal, with adequate internal consistency noted for each scale. Support was also obtained for the concurrent and discriminative validity as well as the absence of social desirability effects.(Beck et al,2008).

Although the IES-R was not developed as a diagnostic tool, examination of its discriminative validity suggests that the measure can differentiate individuals with and without PTSD.

Creamer and colleagues (2003) in a study of psychometric properties of PTSD, compared IES-R with the PTSD Checklist(PCL).By using a PCL cut off of 50 to identify PTSD cases, they found that a total score of 33(1.5) on the IES-R yielded the highest overall predictive power(0.88) of PTSD, providing a sensitivity of 0.91 and a specificity of 0.82.,positive predictive power of 0.90 and negative predictive power of 0.84.(Creamer et al,2003).Test-retest reliability collected across a 6-month interval ranged from 0.89 to 0.94.(Weiss & Marmar,1997).

A high test –retest reliability and good internal consistency for the IES-R were also found in a Japanese version of the IES-R (IESR-R-J) (Asukai et al,2002).
A total score of 33 consistent with Creamer's findings will be used as the cut off for PTSD in this study.

**DATA COLLECTION, ANALYSIS and PRESENTATION**

Data collection was done every working day with the exception of Friday when the cases seen were acute. Subjects were seen between 8am and at about 1pm when the clinic closes. Eligible patients were asked to sign the consent form after which they were issued the self-administered questionnaire to fill and return. Those patients who were not able to fill by themselves were assisted to do so by a trained research assistant .Subjects who scored a sum total of 33 and above on the IES-R scale were considered to have PTSD, and non-PTSD subjects were those scoring less than 33 on the scale.

Data analysis was carried out using Statistical Package of Social Sciences (SSPS) 21.Descripive and inferential statistics were employed in analysing data. Frequencies of demographic variables and accident-related factors were calculated. Univariate analysis of PTSD for both automobile and motorcycle accident survivors was conducted for demographic characteristics and accident-related factors. A multiple logistic regression was also conducted.

Statistical associations were examined using Chi-square test. P-Values of equal or less than 5% were considered statistically significant in the associations and differences that were examined.
The results were presented using charts, graphs, tables and narratives.

## ETHICAL CONSIDERATIONS

Approval to carry out the study was obtained from the department of psychiatry, University of Nairobi. Clearance was then sought from the Kenyatta National Hospital (KNH) Research and Ethics Committee.

The researcher trained a research assistant who helped recruit eligible subjects into the study. An explanation of the study was given by the researcher and the assistant to the patients and thereafter a written informed consent was sought from the ones who fulfilled the inclusion criteria as proof of acceptance to participate.

Participants were recruited on voluntary basis and were informed that information collected would only be used for the purposes of the study.

Confidentiality was assured as no names were used on the questionnaires but only on consent forms for legal purposes only. All research material was stored in a private place till data analysis.

Anyone who opted to quit at any stage of the study was allowed to do so with no consequences for such choice.

No material gain was accorded to the participants. However, medical advice was available to subjects whether or not they took part in the study.

## TIME LINE

| | |
|---|---|
| September 2013-January 2014 | Proposal development |
| February-May 2014 | Ethical clearance |
| May-July 2014 | Data collection |
| July 2014 | Data analysis and report writing; results presentation |

**BUDGET(Apprx.)**

| | |
|---|---|
| Stationery(paper, pens, photocopies) | KSh.15,000 |
| Computer Services(internet, printing, binding) | KSh.25,000 |
| Transport | KSh. 20,000 |
| Data entry and cleaning | KSH.10,000 |
| Data analysis | KSh. 20,000 |
| Miscellaneous | KSh. 15,000 |
| Total | KSh. 105,000 |

The above expenditure was met by the researcher.

## CHAPTER 4: RESULTS

### EPIDEMIOLOGY

**Table 1: Socio demographic characteristics**

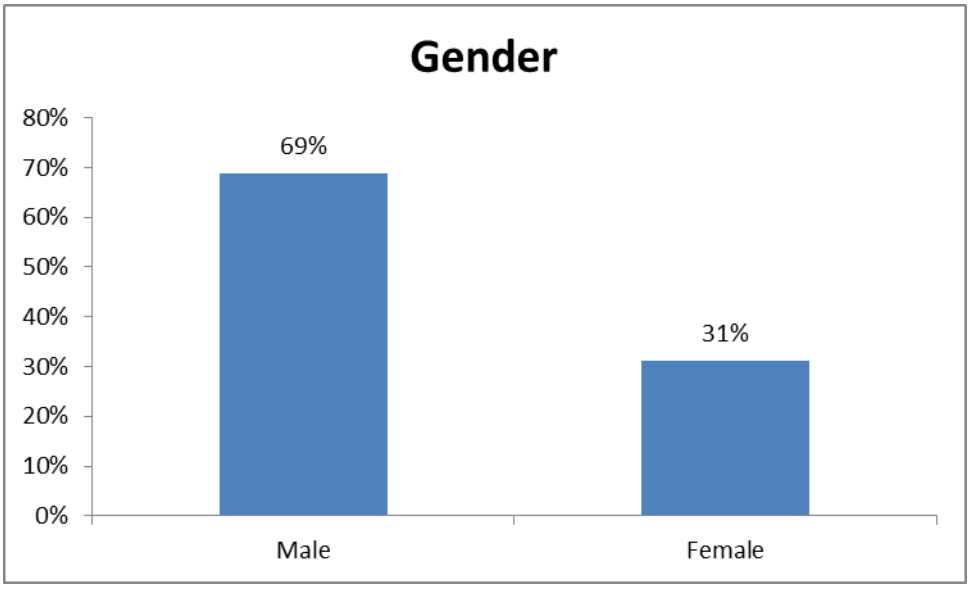
| Characteristic | Detail | n | % |
|---|---|---|---|
| **Gender** | Male | 161 | 68.8% |
| | Female | 73 | 31.2% |
| **Marital status** | Single | 56 | 24.0% |
| | Married | 173 | 74.2% |
| | Divorced/Separated | 2 | 0.9% |
| | Widowed | 2 | 0.9% |
| **Occupation** | Employed | 61 | 26.2% |
| | Self-employed | 113 | 48.5% |
| | Unemployed | 47 | 20.2% |
| | Student | 12 | 5.2% |
| **Religion** | Christian | 225 | 95.7% |
| | Muslim | 7 | 3.0% |
| | None | 3 | 1.3% |
| **Education level** | No formal education | 5 | 2.1% |
| | Primary | 81 | 34.5% |
| | Secondary | 103 | 43.8% |
| | Tertiary | 46 | 19.6% |
| **Stay with** | Alone | 42 | 18.6% |
| | With other people | 184 | 81.4% |
| **Income** | No income | 97 | 42.2% |
| | <5k | 43 | 18.7% |
| | 5k-10k | 40 | 17.4% |

| | | | |
|---|---|---|---|
| | 11k-20k | 22 | 9.6% |
| | >20k | 28 | 12.2% |
| **Ever treated for mental illness** | Yes | 6 | 2.6% |
| | No | 227 | 97.4% |
| **Family member treated for mental illness** | Yes | 11 | 4.7% |
| | No | 224 | 95.3% |

A total number of two hundred and thirty six (n =236) road traffic accident survivors were recruited for the study between the months of May and July,2014. 120 subjects were automobile accident survivors while 114 were motorcycle accident survivors.

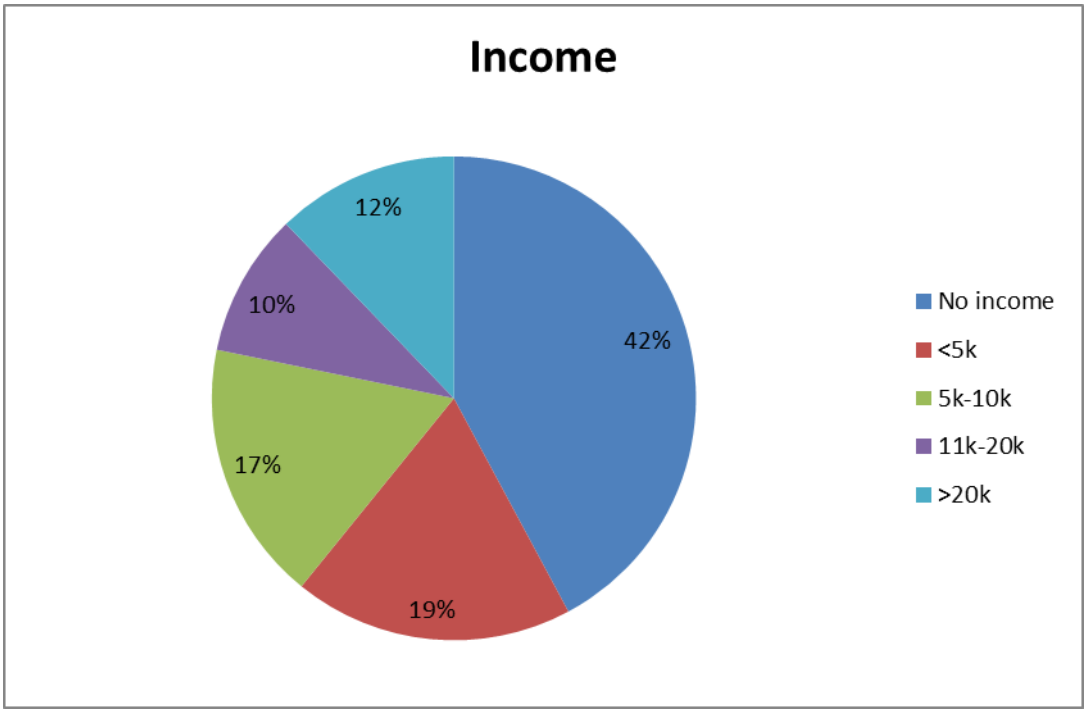
The mean age for the study group was 36years (SD:12);median was 34 years. Majority of the participants were male;68.8%(n=161).Fig.2.

**Figure 2: Gender distribution**




By marital status, three quarters (n=173) of the participants were married and single ones accounting for 24%.(Table 2).Majority of the participants(44%) were secondary school leavers(n=103),19.6% had tertiary education and only 5 subjects had no form of formal education.Nearly half of the participants (42%) were earning no income(n=97) while only 12.2% earned a monthly income of Sh.20,000.(Fig. 3 ).

**Figure 3: Income level**

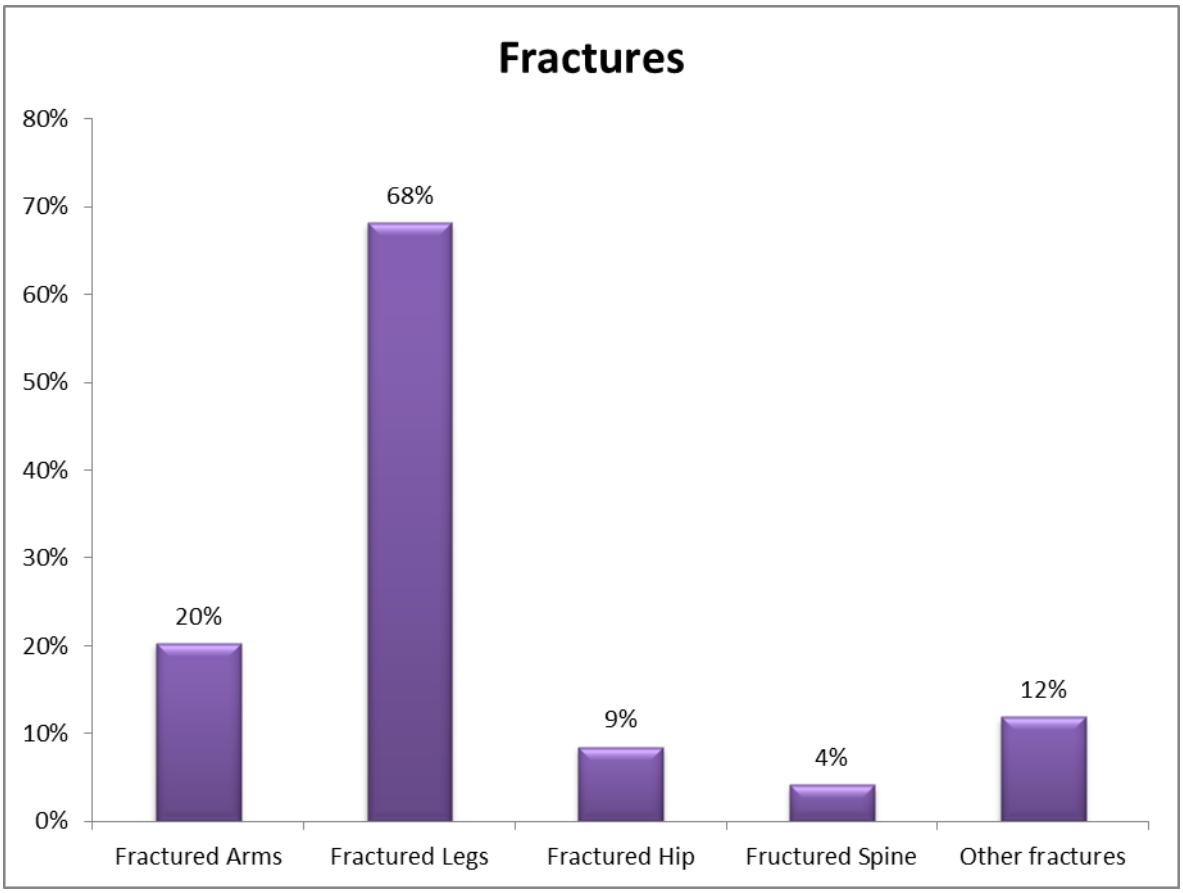



Approximately half of the subjects were self employed and the least, 5% (n=12) were students. In terms of living conditions,18.6% accounted for those living alone while 81.4% lived alone.Two point six per cent(n=6) had a past history of mental illness.

More than three quarters of the participants reported having experienced the accident between one month and 11 months before time of study, while only 6%(n=13)reported five years post accident.(Table 1).68%.Majority of the patients had their accidents during the day as shown in the figure above.

Fracture of the lower limbs accounted for the most injuries amongst the subject, representing 68% of the total,(n=161),followed by fracture of the upper limbs at 20%(n=48).

**Fig.4: Site of fracture**




Of all the subjects only 6(3%) admitted use of a substance of abuse within 24 hours before the accident. A tenth of the subjects (n=24) reported previous history of road traffic accident.

### 4.1.1: SOCIO-DEMOGRAPHIC CHARACTERISTICS

The analysis of socio-demographic characteristics showed a statistically significant difference in gender (P=0.003),marital status(P=0.039)and occupation(P=0.012) in the two groups; motor cycle accident(MCA) and automobile accident(AMA) survivors. As shown in (Table 2), AMA survivors were more likely to be females and were also more likely to be single compared to MCA survivors. In addition AMA survivors were more likely to be employed than the MCA survivors. Education level, level of income and history of mental illness showed no statistically significant difference between the two groups.

**Table 2: Socio-demographic characteristics**

| | | Group | | | | | |
|---|---|---|---|---|---|---|---|
| | | **Motor cycle** | | **Motor vehicle** | | | |
| | | **n** | **%** | **n** | **%** | **Chi-square** | **P value** |
| Gender | Male | 86 | 53.4% | 75 | 46.6% | 4.560 | 0.033 |
| | Female | 28 | 38.4% | 45 | 61.6% | | |
| Marital status | Single | 19 | 33.9% | 37 | 66.1% | 8.382 | 0.039 |
| | Married | 92 | 53.2% | 81 | 46.8% | | |
| | Divorced/Separated | 1 | 50.0% | 1 | 50.0% | | |
| | Widowed | 2 | 100.0% | 0 | 0.0% | | |
| Occupation | Employed | 29 | 47.5% | 32 | 52.5% | 11.027 | 0.012 |
| | Self-employed | 66 | 58.4% | 47 | 41.6% | | |
| | Unemployed | 16 | 34.0% | 31 | 66.0% | | |
| | Student | 3 | 25.0% | 9 | 75.0% | | |
| Religion | Christian | 108 | 48.0% | 117 | 52.0% | 0.628 | 0.730 |
| | Muslim | 4 | 57.1% | 3 | 42.9% | | |
| | None | 2 | 66.7% | 1 | 33.3% | | |
| Education level | No formal education | 3 | 60.0% | 2 | 40.0% | 2.466 | 0.482 |
| | Primary | 37 | 45.7% | 44 | 54.3% | | |
| | Secondary | 55 | 53.4% | 48 | 46.6% | | |
| | Tertiary | 19 | 41.3% | 27 | 58.7% | | |
| Stay with | Alone | 18 | 42.9% | 24 | 57.1% | 0.808 | 0.369 |
| | With other people | 93 | 50.5% | 91 | 49.5% | | |
| Income | No income | 53 | 54.6% | 44 | 45.4% | 5.085 | 0.279 |
| | <5k | 21 | 48.8% | 22 | 51.2% | | |
| | 5k-10k | 21 | 52.5% | 19 | 47.5% | | |
| | 11k-20k | 7 | 31.8% | 15 | 68.2% | | |
| | >20k | 11 | 39.3% | 17 | 60.7% | | |
| Ever treated for mental illness | Yes | 3 | 50.0% | 3 | 50.0% | 0.006 | 0.946 |
| | No | 110 | 48.5% | 117 | 51.5% | | |
| Family member treated for mental illness | Yes | 5 | 45.5% | 6 | 54.5% | 0.043 | 0.835 |
| | No | 109 | 48.7% | 115 | 51.3% | | |

### 4.1.2: ACCIDENT RELATED FACTORS

Analysis of the factors related to the accident showed that in terms of status/role at accident, pedestrians were more likely to be AMA survivors than MCA survivors and the difference was statistically significant.(Table 3).Time of accident, hospitalization post accident, site of fracture, substance use and previous history of accident showed no statistically significant differences between the two groups.

**Table 3: Accident related factors**

| | | Group | | | | | |
|---|---|---|---|---|---|---|---|
| | | **Motor cycle** | | **Motor vehicle** | | | |
| | | n | **%** | **n** | **%** | **Chi-square** | **P value** |
| Vehicle causing accident | Personal car | 37 | 44.0% | 47 | 56.0% | 105.6 | <0.0001 |
| | Matatu/Bus | 7 | 10.8% | 58 | 89.2% | | |
| | Motor cycle | 64 | 98.5% | 1 | 1.5% | | |
| | Truck/Lorry/Pickup/Tractor | 6 | 35.3% | 11 | 64.7% | | |
| | Other | 0 | 0.0% | 2 | 100.0% | | |
| Time of accident | 1-2 months ago | 42 | 48.3% | 45 | 51.7% | 4.749 | 0.314 |
| | 3-11 months ago | 48 | 50.5% | 47 | 49.5% | | |
| | 1-2 years ago | 14 | 46.7% | 16 | 53.3% | | |
| | 3-5 years ago | 6 | 66.7% | 3 | 33.3% | | |
| | >5 years ago | 3 | 23.1% | 10 | 76.9% | | |
| Status/Role at accident | Driver | 4 | 16.7% | 20 | 83.3% | 140.5 | <0.0001 |
| | Motor cycle rider | 58 | 100.0% | 0 | 0.0% | | |
| | Passenger | 7 | 12.7% | 48 | 87.3% | | |
| | Motorcycle passenger | 26 | 100.0% | 0 | 0.0% | | |
| | Pedestrian | 19 | 26.8% | 52 | 73.2% | | |
| Time of day of accident | Day | 79 | 49.7% | 80 | 50.3% | 0.186 | 0.666 |
| | Night | 35 | 46.7% | 40 | 53.3% | | |
| Result of accident | Admitted and surgery done | 53 | 44.5% | 66 | 55.5% | 3.674 | 0.159 |
| | Admitted without surgery | 22 | 43.1% | 29 | 56.9% | | |
| | Not admitted | 34 | 58.6% | 24 | 41.4% | | |
| Fractured Arms | Fracture | 28 | 57.1% | 21 | 42.9% | 1.934 | 0.164 |
| | No fracture | 86 | 46.0% | 101 | 54.0% | | |
| Fractured Legs | Fracture | 75 | 46.6% | 86 | 53.4% | 0.601 | 0.438 |
| | No fracture | 39 | 52.0% | 36 | 48.0% | | |
| Fractured Hip | Fracture | 11 | 55.0% | 9 | 45.0% | 0.392 | 0.531 |
| | No fracture | 103 | 47.7% | 113 | 52.3% | | |
| Fructured Spine | Fracture | 3 | 30.0% | 7 | 70.0% | 1.401 | 0.237 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | No fracture | 111 | 49.1% | 115 | 50.9% | | |
| Other fractures | Fracture | 14 | 50.0% | 14 | 50.0% | 0.037 | 0.848 |
| | No fracture | 100 | 48.1% | 108 | 51.9% | | |

### 4.2: PTSD

#### 4.2.1: PTSD PREVALENCE

The IES-R score was obtained for each participant in the study. As described in the methodology chapter, a total IES-R score of 33 was taken as the cut off for PTSD. In other words, any participant who scored 33 and above met a diagnosis of PTSD.

**Table 4-PTSD prevalence**

| | | n | % |
|---|---|---|---|
| PTSD scale | No PTSD | 108 | 45.8% |
| | PTSD | 128 | 54.2% |

As shown in table 4 above,54.2%(n=128) of the total participants met the diagnosis of PTSD while 45.8% of them had no PTSD.

The mean IES-R score was 35(SD 18).

**Table 5: PTSD prevalence among MCA and AMA survivors**

| | | PTSD scale | | | | | |
|---|---|---|---|---|---|---|---|
| | | No PTSD | | PTSD | | | |
| | | n | % | n | % | Chi-square | P value |
| Group | Motor cycle | 64 | 56.1% | 50 | 43.9% | 10.047 | 0.002 |
| | Motor vehicle | 43 | 35.5% | 78 | 64.5% | | |

Further analysis showed that PTSD prevalence among the AMA survivors was 64.5% while that of MCA survivors was 43.9% and the difference was statistically significant(P=0.002).

### 4.2.2: PTSD SYMPTOM CLUSTERS

**Table 6: IESR-subscales (PTSD symptom clusters).**

| | Mean | Median | Minimum | Maximum | Standard Deviation |
|---|---|---|---|---|---|
| Intrusion | 1.7 | 1.6 | .0 | 4.0 | .9 |
| Avoidance | 1.6 | 1.6 | .0 | 4.0 | .9 |
| Hyper arousal | 1.6 | 1.5 | .0 | 4.0 | 1.0 |

As shown in the above table, the intrusion symptoms of PTSD were the more prevalent in the whole study population, with a mean of 1.7 points(SD 0.9).

**Table 7: IES-R subscales (PTSD symptom clusters) and association with vehicle type**

| | | N | Mean | Std. Deviation | 95% Confidence Interval for Mean | | F | P value |
|---|---|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound | | |
| Intrusion | Motor cycle | 100 | 1.453 | .9208 | 1.270 | 1.635 | 11.145 | 0.001 |
| | Motor vehicle | 108 | 1.869 | .8793 | 1.701 | 2.037 | | |
| | Total | 208 | 1.669 | .9212 | 1.543 | 1.795 | | |
| Avoidance | Motor cycle | 103 | 1.472 | .9473 | 1.287 | 1.657 | 6.728 | 0.010 |
| | Motor vehicle | 111 | 1.782 | .7958 | 1.632 | 1.931 | | |
| | Total | 214 | 1.633 | .8836 | 1.514 | 1.752 | | |
| Hyper arousal | Motor cycle | 101 | 1.332 | 1.0112 | 1.132 | 1.531 | 11.620 | 0.001 |
| | Motor vehicle | 94 | 1.809 | .9368 | 1.617 | 2.000 | | |
| | Total | 195 | 1.562 | 1.0024 | 1.420 | 1.703 | | |

The above table shows that intrusion, avoidance and hyper arousal symptoms of PTSD were more likely to be in the AMA survivors than MCA survivors and the differences were statistically significant.

## 4. BIVARIATE ANALYSIS OF FACTORS ASSOCIATED WITH PTSD

### 4.3.1: Socio-demographic characteristics and association with PTSD

**Table 8: Bivariate analysis association of socio-demographic factors with PTSD**

| | | PTSD scale | | | | | |
|---|---|---|---|---|---|---|---|
| | | No PTSD | | PTSD | | | |
| | | n | % | n | % | Chi-square | P value |
| Gender | Male | 75 | 46.6% | 86 | 53.4% | 0.153 | 0.696 |
| | Female | 32 | 43.8% | 41 | 56.2% | | |
| Marital status | Single | 27 | 48.2% | 29 | 51.8% | 4.3 | 0.231 |
| | Married | 77 | 44.5% | 96 | 55.5% | | |
| | Divorced/Separated | 0 | 0.0% | 2 | 100.0% | | |
| | Widowed | 2 | 100.0% | 0 | 0.0% | | |
| Occupation | Employed | 27 | 44.3% | 34 | 55.7% | 8.799 | 0.032 |
| | Self-employed | 60 | 53.1% | 53 | 46.9% | | |
| | Unemployed | 13 | 27.7% | 34 | 72.3% | | |
| | Student | 6 | 50.0% | 6 | 50.0% | | |
| Religion | Christian | 103 | 45.8% | 122 | 54.2% | 0.206 | 0.902 |
| | Muslim | 3 | 42.9% | 4 | 57.1% | | |
| | None | 1 | 33.3% | 2 | 66.7% | | |
| Education level | No formal education | 3 | 60.0% | 2 | 40.0% | 4.715 | 0.194 |
| | Primary | 33 | 40.7% | 48 | 59.3% | | |
| | Secondary | 44 | 42.7% | 59 | 57.3% | | |
| | Tertiary | 27 | 58.7% | 19 | 41.3% | | |
| Stay with | Alone | 15 | 35.7% | 27 | 64.3% | 2.205 | 0.138 |
| | With other people | 89 | 48.4% | 95 | 51.6% | | |
| Income | No income | 50 | 51.5% | 47 | 48.5% | 13.638 | 0.009 |
| | <5k | 20 | 46.5% | 23 | 53.5% | | |
| | 5k-10k | 8 | 20.0% | 32 | 80.0% | | |
| | 11k-20k | 11 | 50.0% | 11 | 50.0% | | |
| | >20k | 16 | 57.1% | 12 | 42.9% | | |
| Ever treated for mental illness | Yes | 4 | 66.7% | 2 | 33.3% | 1.113 | 0.291 |
| | No | 102 | 44.9% | 125 | 55.1% | | |
| Family member treated for mental illness | Yes | 4 | 36.4% | 7 | 63.6% | 0.391 | 0.532 |
| | No | 103 | 46.0% | 121 | 54.0% | | |

As shown in Table 8,among the socio-demographic characteristics, the level of income and occupation showed significant statistical associations with PTSD at P-values of 0.009 and 0.032 respectfully. Gender, marital status, history of mental illness were not

statistically associated with PTSD (P>0.05).Although not statistically significant, those who stayed alone showed higher rates of PTSD.

### 3.3 Accident related factors and association with PTSD

**Table 9: Bivariate analysis assessing accident related factors associated with PTSD**

| | | PTSD scale | | | | | |
|---|---|---|---|---|---|---|---|
| | | No PTSD | | PTSD | | | |
| | | n | % | n | % | Chi-square | P value |
| Vehicle causing accident | Personal car | 35 | 41.7% | 49 | 58.3% | 7.053 | 0.133 |
| | Matatu/Bus | 24 | 36.9% | 41 | 63.1% | | |
| | Motor cycle | 37 | 56.9% | 28 | 43.1% | | |
| | Truck/Lorry/Pickup/Tractor | 10 | 58.8% | 7 | 41.2% | | |
| | Other | 1 | 50.0% | 1 | 50.0% | | |
| Time of accident | 1-2 months ago | 40 | 46.0% | 47 | 54.0% | 0.584 | 0.965 |
| | 3-11 months ago | 44 | 46.3% | 51 | 53.7% | | |
| | 1-2 years ago | 14 | 46.7% | 16 | 53.3% | | |
| | 3-5 years ago | 3 | 33.3% | 6 | 66.7% | | |
| | >5 years ago | 6 | 46.2% | 7 | 53.8% | | |
| Status/Role at accident | Driver | 12 | 50.0% | 12 | 50.0% | 4.356 | 0.360 |
| | Motocycle rider | 28 | 48.3% | 30 | 51.7% | | |
| | Passenger | 22 | 40.0% | 33 | 60.0% | | |
| | Motorcycle passenger | 16 | 61.5% | 10 | 38.5% | | |
| | Pedestrian | 29 | 40.8% | 42 | 59.2% | | |
| Time of day of accident | Day | 76 | 47.8% | 83 | 52.2% | 1.251 | 0.263 |
| | Night | 30 | 40.0% | 45 | 60.0% | | |
| Result of accident | Admitted and surgery done | 54 | 45.4% | 65 | 54.6% | 0.176 | 0.916 |
| | Admitted without surgery | 24 | 47.1% | 27 | 52.9% | | |
| | Not admitted | 25 | 43.1% | 33 | 56.9% | | |
| Fractured Arms | Fracture | 20 | 41.7% | 28 | 58.3% | 0.407 | 0.523 |
| | No fracture | 88 | 46.8% | 100 | 53.2% | | |
| Fractured Legs | Fracture | 69 | 42.9% | 92 | 57.1% | 1.723 | 0.189 |
| | No fracture | 39 | 52.0% | 36 | 48.0% | | |
| Fractured Hip | Fracture | 15 | 75.0% | 5 | 25.0% | 7.526 | 0.006 |
| | No fracture | 93 | 43.1% | 123 | 56.9% | | |
| Fructured Spine | Fracture | 5 | 50.0% | 5 | 50.0% | 0.076 | 0.783 |
| | No fracture | 103 | 45.6% | 123 | 54.4% | | |
| Other fractures | Fracture | 17 | 60.7% | 11 | 39.3% | 2.861 | 0.091 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | No fracture | 91 | 43.8% | 117 | 56.2% | | |
| Substance abuse 24 hours before accident | Yes | 2 | 33.3% | 4 | 66.7% | 0.365 | 0.546 |
| | No | 103 | 45.8% | 122 | 54.2% | | |
| Alcohol | Yes | 1 | 14.3% | 6 | 85.7% | 2.880 | 0.090 |
| | No | 107 | 46.7% | 122 | 53.3% | | |
| Bhang | Yes | 1 | 100.0% | 0 | 0.0% | 1.190 | 0.275 |
| | No | 107 | 45.5% | 128 | 54.5% | | |
| Miraa | Yes | 0 | 0.0% | 2 | 100.0% | 1.702 | 0.192 |
| | No | 108 | 46.2% | 126 | 53.8% | | |
| Other Drug | Yes | 0 | 0.0% | 0 | 0.0% | - | - |
| | No | 108 | 45.8% | 128 | 54.2% | | |
| Previous history of accident | Yes | 6 | 25.0% | 18 | 75.0% | 4.795 | 0.029 |
| | No | 100 | 48.5% | 106 | 51.5% | | |

Out of the factors studied, only two had significant statistical association with PTSD. These were fracture of the hip(P=0.006),and previous history of accident(P=0.029).Duration since the accident occurred, status/role at accident, status of admission to hospital post accident and history of substance abuse 24 hrs before accident showed no association with PTSD occurrence(P>0.05).

However, those injured at night were more likely to suffer PTSD than those injured during the day. Likewise, those who had taken alcohol had a higher chance of having PTSD than those who had not. Those admitted in hospital post accident were less likely to have PTSD than those not admitted.(Table 9).

## 4.4: MULTIVARIATE ANALYSIS OF FACTORS ASSOCIATED WITH PTSD

**Table 10: Multivariate analysis**

| | Coefficient | S.E. of Coefficient | P value | OR | 95% C.I. for OR | |
|---|---|---|---|---|---|---|
| | | | | | Lower | Upper |
| Occupation | .155 | .203 | .444 | 1.168 | .785 | 1.737 |
| Income | .033 | .119 | .783 | 1.033 | .818 | 1.306 |
| Fractured Hip | 1.416 | .555 | .011 | 4.119 | 1.388 | 12.225 |
| Previous Accident | 1.109 | .526 | .035 | 3.032 | 1.082 | 8.495 |
| motorvehicle | .917 | .294 | .002 | 2.501 | 1.406 | 4.450 |

Adjusting for occupation and income, absence of a fractured hip, history of a previous accident and having an auto mobile accident are associated with increased risk of PTSD. Specifically, patients of an automobile accident are 2.5 times more likely to have PTSD than those of a motor cycle accident (p=0.002, OR=2.5 [95% CI of OR 1.4 – 4.5]) (Table 10).

# CHAPTER 5: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

## DISCUSSION

Numerous studies have been done on PTSD and associated factors on motor vehicle accident survivors in general, with findings showing significant PTSD rates and conflicting findings on associated factors. To the best of my knowledge, no study has compared PTSD of automobile and motorcycle-accident survivors. In this study, it was found that patients of an automobile accident are 2.5times more likely to have PTSD than those of a motorcycle accident. Level of income, occupation, previous MVA and absence of hip fracture were factors found to be associated with PTSD in this study.

### 5.1.1:PTSD PREVALENCE

In this study an overall PTSD prevalence rate of 54% was found. This rate is higher than for most of the studies done on similar populations with ranges of 8 and 45%.(Blanchard et al,2004;Ehler et al,1998;Guzel et al,2009;Iteke et al,2011,FA Ongecha-Owuor,2004).Only one Nigerian study done among neuropsychiatric patients had a PTSD prevalence among females that was almost similar to this study's(57.1%),(Makput,et al,2011).The differences in PTSD prevalence rates could be related to the use of different study instrument, different diagnostic criteria for PTSD and other methodological differences. Differences in cultural backgrounds could also be a factor (Jennifer Dawson,2007). This study employed the IES-R scale in diagnosing PTSD.

The IES-R scale has been adopted as a measure of screening rather than a diagnostic tool. However, examination of its discriminative validity suggests that the measure can differentiate individuals with and without PTSD. The psychometric properties done were in non-Africa countries and so may be socio-culturally biased.

It is not unlikely that the scale captured even sub syndromal cases of PTSD who still harbored significant traumatic stress, giving a higher PTSD rate than the one of 13.3% found by Ongecha-Owuor et al, in the same study setting 10 years ago. In their study they had used DSM-IV's PTSD diagnostic criteria.

In a study done on motor vehicle victims to assess for psychological morbidity as a result of the accident,46% of the victims met the criteria for PTSD while 20% showed a

subsyndromal version(re-experiencing symptom cluster plus either the avoidance cluster or the hyper arousal cluster(Blanchard et al,1994).
These rates can also be compared with other different groups of trauma survivors. One such study done on Mau Mau war veterans (Atwoli et al,2006) showed PTSD prevalence rate of 65.7%.It employed DSM-IV-TR for diagnosis. It is possible then that the nature of the trauma may influence PTSD rates.

The IES-R scale as used in this study to assess PTSD has three subscales; the Intrusion (8 items), Avoidance (8items) and Hyperarousal (6 items) subscales which correspond to the DSM-IV symptom criteria for PTSD. The symptoms were rated using a 5- point Likert scale ranging from 0 to 4.In this study intrusion symptoms were found to be most prevalent with a mean of 1.7 out of 4 points. This is consistent with findings of a study done in outpatients in a Northern Nigerian Neuropsychiatric hospital.(Makput et al,2011).

This study also found intrusion, avoidance and hyperarousal symptoms to be more prevalent among AMA survivors than MCA survivors and the differences were statistically significant. The intrusion symptoms could be the more distressing and hence the more reported ones. PTSD prevalence rate among automobiles was higher than that of motor cycles accident survivors and the differences were statistically significant.

No data are available to compare the rates in other studies. However, evidence indicates of a dose- response relationship between the degree of trauma and the likelihood of symptoms.(Rawal et al,2010). Motorcycles have been found to cause more serious accidents than automobiles and that mortality was 35 times more likely in their accident victims. The PTSD rates found in this study surprisingly,proved the contrary.

An explanation to this finding could be that motor vehicles are more commonly used in this country as a means of transport than motorcycles and so an individual is more likely to have had repeated exposures to automobile travel than motorcycles which are commonly used by passengers for convenience. Likewise automobile accidents are usually more reported in the media compared to motorcycles ones. These constant exposures could translate to a high likelihood developing PTSD.

### 5.1.2: SOCIO-DEMOGRAPHIC CHARACTERISTICS AND PTSD

Despite several studies, there are conflicting findings relating to risk factors and predictors of PTSD. No clear demographic factors have been established for PTSD (Kupchik et al,2009).

In this study, gender, marital status, occupation, educational level, income level among other socio-demographic characteristics were studied for association with PTSD. Only occupation and level of income were associated with the existence of PTSD. Consistent with this study, gender and premorbid psychiatric illness have not been found to affect the development of PTSD in previous studies.(Kupchik et al,2007,Jeavons 2000).

In other studies, contrasting findings have been found on gender and history of psychiatric illness. In their studies, Blanchard et al and Ehlers et al found female gender as a risk factor for chronic PTSD(Blanchard et al,1996,Ehlers et al,1998).A Canadian study done on impact of motor vehicle injury on distress found that men suffered more overall distress than women. It is possible then that socio-cultural differences between different populations in terms of coping with distress could have accounted for this difference.

This study found no significant differences in association of PTSD and gender between MCA and AMA survivors.

Concerning marital status, no association was found for PTSD in this study. This is consistent with findings from the study done on a similar study population in the same study setting ten years ago.(Ongecha et al,2004).It would be assumed that being married would somehow cushion one from the psychological distress of PTSD and so reflect in the study, but possibly this would only apply on stable and supportive marriage relationships which is not always the case. In addition, a study of trauma and PTSD done on a primary care population in South Africa showed an association of PTSD and single status (Carey et al,2003).

There were no significant differences in association of PTSD and marital status in MCA and AMA survivors.

Concerning education level and PTSD, this study showed that those who had post primary education were more likely to suffer PTSD though association was not statistically significant. This is consistent with findings from a study done earlier in the similar study

population that showed that post primary education was indeed a risk factor for PTSD amongst the motor vehicle accident survivors(Ongecha et al,2004).No significant differences were found for this factor between the MCA and AMA survivors. Explanation to this could be that the more one is educated, the more one is able to perceive the impact and implication of their disability in life.

History of mental illness would be expected to increase the chances of developing PTSD as coping mechanisms following stress in the affected persons are usually compromised. It has been observed that PTSD following MVAs often co-occurs with other psychiatric disorders. However, in this study, having a history of mental illness in the subjects was not a risk factor for PTSD. This is consistent with a study done on demographic and clinical characteristics of motor vehicle accident victims where history of premorbid psychiatry illness was not a predisposing feature of PTSD.(Kupchik et al,2007).

A different picture was seen in studies done earlier in similar study populations to this study's where history of mental illness was a risk factor of PTSD.(Ongecha et al,2004,Blanchard et al,1995).In his study of Acute stress response and PTSD in traffic accident victims 65% of the patients who had PTSD were found to have a co-morbid condition.(Koren et al,1999).

It is worthwhile to note that the subjects in this study, unlike some other studies were not assessed for psychiatric illness using any standardized diagnostic criteria for psychiatric illness .There are chances that some subjects denied history of mental illness due to stigma associated with mental disease. It is also likely that patients had past or current psychiatric disorders but they were not aware or were indifferent to the symptoms.

There was no significant association in history of psychiatric illness and PTSD between MCA and AMA survivors.

Occupation was a demographic characteristic that was significantly associated with PTSD in this study(P=0.032).It was noted that in the general study population those who had PTSD were more likely to have been employed compared to the ones who had no PTSD. In contrast, those who had no PTSD were more likely to have been self-employed. This finding was consistent with findings in a study done on RTA victims and control groups

where being gainfully employed before the accident had a statistically significantly increased likelihood of PTSD(Iteke et al,2011).

It is possible that being employed may pose a psychological distress risk owing to subsequent absence at work, decreased productivity and a possible risk of loss of job following MVAs. Consequently PTSD was less likely in the self employed as they were not faced with the above risks.

The association of occupation and PTSD among MCA survivors was statistically significant (P=0.008) while it was not among the AMA survivors (P=0.55).However, the differences in associations for both groups were not statistically significant.(P=0.44).

Income was found to be predictive of PTSD in this study. Those with PTSD were more likely to have had less income (up to KSH.20,000) than those who had no PTSD. In contrast, those who had no PTSD were more likely to have been earning >KSH 20,000.The explanation could be that the ones who had higher income were possibly not distressed of risk of losing job post MVA as they may have had some form of security like insurance that would compensate them in case of economic losses.

### 5.1.3: ACCIDENT RELATED FACTORS AND PTSD

Apart from socio-demographic characteristics, other factors related to the accident could predict development of PTSD among MVA survivors.

In this study, absence or presence of hip fracture and history of previous motor vehicle accident were found to be risk factors for PTSD occurence. Of those who had hip fractures, three quarters of them had no PTSD, meaning that those who had hip fracture were more likely to be PTSD free (P=0.006).This was a surprising finding as hip fractures would be expected to be incapacitating and hence a risk factor.

Those with PTSD were more likely to have had fractures of upper limbs and lower limbs. The differences were however not statistically significant, (P=0.52 and P=0.189 respectfully).

There were no comparative data found in other studies for this variable.

The association of hip fracture and PTSD in AMA survivors was more than the association in MCA survivors and the difference was statistically significant.(P=0.011).

On the other hand, history of a previous MVA was a risk factor for PTSD in this study. Findings consistent with this study have been implicated in other studies.(Harvey & Briant,1999;Kupchik et al,2007).An earlier study done in the same study site and population as this one had contrasting findings in that experiencing the first motor vehicle accident was a risk factor for PTSD.(Ongecha et al,2004).

Other accident related factors including role/status at accident, time since accident, time of accident, history of substance use before the accident were also studied and were found not to be risk factors for PTSD development. However, though not statistically significant, being an automobile passenger and being a pedestrian at time of accident increased the likelihood of developing PTSD. This is in keeping with findings of a study done on the psychological wellbeing of At fault drivers and related passengers where blaming others for the accident was associated with higher levels of psychological distress (Ho et al, 2000; Nickerson et al,2013).In Ongecha et al,2004 study, no significant association in role/status of accident and PTSD was found. Concerning time since accident, it has been found that PTSD occurrence was influenced by this factor. A study done on different times after the accident found decreasing rates of PTSD with time (Guzel et al,2009).In this study those who had PTSD were more likely to be those who had accidents longer time before study.

Though not statistically significant, those injured at night were more likely to develop PTSD than those injured during the day. Likewise this study showed that those who had taken alcohol were more likely to develop PTSD. The differences in associations of these factors and PTSD between MCA and AMA were not statistically significant.

## LIMITATIONS OF THE STUDY

1) The self-report nature of this study could have created a bias.
2) This study assessed only the latest MVA that subjects were being treated for. Other different traumas that could have occurred in the subjects' life-time were not taken into account. These could well have had an influence on these results.
3) This study employed the IES-R scale whose psychometric properties have not been examined for the African context for PTSD diagnosis.

## CONCLUSION

Post Traumatic Stress Disorder is prevalent among survivors of Motor vehicle accident survivors in Kenya. There is a higher prevalence rate of PTSD among the Automobile accident survivors compared to the Motorcycle accident survivors. No specific factor has been established as predictive of PTSD among MVA survivors. As observed by Blanchard et al in their study it appears that each individual involved in an MVA brings with them individual risk factors for PTSD and that each accident has its unique traumatic aspects that interact with the variable perceptions of every person involved in the accident.

## RECOMMENDATIONS

1) Introduce routine screening for PTSD for all patients involved in motor vehicle accidents attending trauma care facilities.

2) Educate the general public on psycho trauma.

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**APPENDIX 1: CONSENT FORM EXPLANATION(With Kiswahili translation)**

*Maelezo ya fomu ya Idhini*

**INTRODUCTION**

My name is Dr.Gathuru. I am post graduate student at the University of Nairobi, department of Psychiatry. I wish to carry out a study on Post Traumatic Stress Disorder (PTSD) on automobile and motorcycle accident survivors who are being followed up in this clinic. PTSD is an anxiety disorder that occurs in some people after experiencing a major trauma.

I will require some information from you for the study. The information I will get from you is meant to influence policy making in the health and transport sector to help those who are at risk of PTSD following motor vehicle accidents. It is meant also to encourage transport safety measures to be put in place.

The study will be conducted by myself under the supervision of Prof. Ndetei and Dr. Mburu, both lecturers at the University of Nairobi.

***UTANGULIZI***

*Jina langu ni Dr. Gathuru. Mimi ni mwanafunzi wa Chuo Kikuu cha Nairobi, idara ya Psychiatry. Ningependa kufanya utafiti kuhusu Post Traumatic Stress Disorder (PTSD) kwa waathiriwa wa ajali za gari na pikipiki ambao wanafuatiliwa katika kliniki hii. PTSD ni aina ya ugonjwa wa kuhangaika unaopatikana kwa watu wengine baada ya kupitia kiwewe kikubwa.*

*Nitahitaji habari flani kutoka kwako katika utafiti huu. Habari nitakayoipata kutoka kwako ni kwa kusudi la kushawishi uundaji sera kwenye sekta za afya na usafiri ili kuwasaidia walio katika hatari ya kupata PTSD baada ya ajali ya magari. Pia ina kusudi la kuhamasisha kutiwa mikakati ya usalama wa usafiri.*

*Nitaendesha utafiti huu chini ya usimamizi wa Profesa Ndetei na Dr. Mburu, wote wakiwa wahadhiri katika Chuo Kikuu cha Nairobi.*

**PROCEDURE**

I am going to issue you with a questionnaire which is a piece of paper with questions and choices on it which you will carefully read and follow the instructions given. I will be available for any clarification on the questionnaire. The exercise will take about 30-45 minutes of your time.

**UTARATIBU**

*Nitakupa kijikaratasi kilicho na orodha ya maswali ya utafiti huu ambacho utasoma kwa makini na kufuata maagizo uliyopewa. Nitakuwepo kutoa ufafanuzi wowote zaidi kuhusu orodha hiyo ya maswali. Zoezi hili litachukua muda wako wa dakika 30-45.*

**CONFIDENTIALITY**

The information you will give is confidential and will be used only for the purposes of the study.

You will not be identified by your name but by a number you will be assigned once you have accepted to participate.

***SIRI***

*Habari utakayotoa ni ya siri na itatumika tu kwa ajili ya utafiti huu. Hautatambuliwa kwa jina lako bali kutumia nambari utakayopewa utakapokubali kushiriki.*

**RISKS**

Your participation is optional and you may opt out at any stage if you choose to. In the event you exit, you will not be penalised or lose any benefits or rights that you are otherwise entitled to.

There will be no invasive procedures used in this study though the questions asked may provoke some memories which may cause discomfort. In the event this happens to you, I will be available to offer guidance and I may still refer you to a counsellor if need be.

***HATARI***

*Ushiriki wako ni wa hiari na uko huru kujiondoa kushiriki wakati wowote. Iwapo utajiondoa, hautaadhibiwa au kupoteza manufaa yoyote au haki zozote ulizonazo.*

*Hakutakuwa taratibu vamizi kwenye utafiti huu ingawa maswali mengine yatakayoulizwa huenda yakaamsha kumbukumbu ambazo huenda zifanye uhisi usumbufu. Ikiwa hili litatokea kwako, nitaweza kukupa mawaidha na pia naweza kukuelekeza kwa mshauri ikiwa utahitaji.*

**BENEFITS**

There is no material gain from the study. The study is aimed at benefiting the larger society through the recommendations from this study.

***MANUFA/FAIDA***

*Utafiti huu hauna faida yoyote ya kifedha au vifaa. Utafiti huu una nia ya kufaidi jamii kupitia mapendekezo yatakayotolewa.*

**CONTACTS**

For any questions or clarifications, you can contact me on phone number 0721595959.You can also reach my supervisors on phone; Prof Ndetei-0712518365 and Dr,Mburu-0722245177.You can contact the Dept. of Psychiatry, UON, or the Ethics Committee located at KNH.

I thank you all.

Dr. Gathuru

***MAWASILIANO***

*Kwa maswali yoyote au ufafanuzi zaidi, unaweza kuwasiliana nami kwa nambari ya simu 0721595959. Pia unaweza kuwasiliana na wasimamizi wangu kupitia simu: Profesa Ndetei – 0712518365 na Dr. Mburu – 0722245177. Pia unaweza kuwasiliana na Idara ya Psychiatry, Chuo Kikuu cha Nairobi au Kamati ya maadili ilioko KNH.*

Nawashukuru nyote.

Dr. Gathuru

**CONSENT FORM**

I……..do hereby accept to voluntarily participate in the study on PTSD on motor vehicle accident survivors being carried out at the orthopaedic clinic in KNH. The nature and purpose of the study has been explained to me at length by Dr Gathuru.

Signed……. (Patient)

Date……..

Signed…….. (Witness; Dr. Gathuru)

Date…….

***FOMU YA IDHINI***

Mimi…….nakubali kushiriki kwa hiari kwenye utafiti huu wa PTSD kwa waathiriwa wa ajali za magari unaofanywa katika kliniki ya mifupa ya KNH. Nimeelezwa hali na sababu ya utafiti huu kwa kina na Daktari Gathuru.

*Sahihi*…….. *(Mgonjwa)*

*Tarehe*……

*Sahihi*…….. *(Shahidi;Dr. Gathuru)*

*Tarehe*…….

**APPENDIX 2-STUDY INSTRUMENTS:QUESTIONNAIRE**

**SOCIO-DEMOGRAPHIC QUESTIONNAIRE**

Date……..

Serial No…….

**1.Age**(years)……..

**2.Gender:**

a)Male

b)Female

3.Residence(county)……..

**4 What is your marital status?**

a)Single

b)Married

c)Separated/Divorced

d)Widowed

**5.What is your occupation?**

a)Student

b)Employed

c)Self-employed

d)Unemployed

d)Others[specify]……

**6.What is your religion?**

a)None

b)Christian

c)Muslim

d)Hindu

e)Other[specify]…….

**7.What is your highest level of education?**

a)No formal education

b)Primary school

c)Secondary school

d)College/university

**8.Whom do you stay with?**

a)Alone

b)With other person/people

**9.What is the approximate level of your income[if earning income][Ksh]**

a)Sina mapato

b)less than 5000

c)between 5000 and 10,000

d)between 11,000 and 20,000

e)Above 20,000

**10.Have you ever been treated for a mental illness?**

a)Yes

b)No

**11.Has anyone in your family been treated for a mental illness?**

a)Yes

b)No

**ACCIDENT-RELATED FACTORS**

**12.What is the type of vehicle that directly caused your injury/injuries?**

a)Motorcycle

b)personal car

c )matatu/bus

b)truck,lorry,pickup,tractor

c)Other[specify]…….

**13.When did the accident happen?**

a)1 to 2 months ago

b)3 to 11 months ago

c) 1year to 2 years ago

d)3years to 5 years

e)More than 5 years

**14.What was your status/role at the time of accident?**

a)Driver

b)Passenger

c)Motorcycle rider

d)Motorcycle passenger

e)Pedestrian

**15.What time did the accident occur?**

a)Day

b)Night

**16.What happened to you following the accident?**

a)I was admitted in hospital and surgery done

b)I was admitted in hospital but no surgery done

c)I was not admitted in hospital

**17.What injury did you sustain following the accident?(Tick where applicable)**

a)Fracture of the upper limbs(arms)

b)Fracture of the lower limbs(legs)

c)Fracture of hip

d)Fracture of the spine

e)Other[specify]……

**18.Had you used any substance of abuse within 24hrs before the accident?** a)Yes

b)No

**19.If yes above, which one(s)?Tick where appropriate**

a)alcohol

b)bhang

c)miraa

d)other(indicate)_____

**20.Have you ever had another road traffic accident before?**

a)Yes

b)No

**SOCIO-DEMOGRAPHIC QUESTIONNAIRE in KISWAHILI VERSION**

Tarehe ----------

Nambari---------

**1.Umri wako**(miaka)----------

**2.Jinsia yako ni?**

a)Mwanamke

b)Mwanamume

**3.Unaishi wapi?**(County)--------

**4.Hali yako ya ndoa ni?**

a)Sijaoa/ sijaolewa

b)Nimeoa/nimeolewa

c)Nimetengana na mke/mume wangu

d)Ninefiwa na mke/mume wangu

**5.Wewe unafanya kazi gani?**

a)Mimi ni mwanafunzi

b)Mimi nimeajiriwa

c)Mimi nimejiajiri kwa kazi yangu

d)Mimi sina kazi yoyote

**6.Je,unashiriki dini gani?**

a)Sina dini

b)Kikristu

c)Kiislamu

d)Kihindi

d)Dini ingine(taja ni gani_____)

**7.Kiwango cha juu cha masomo yako ni---?**

a)Sijaenda shule

b)Shule ya msingi

c)Shule ya upili

d)college/chuo kikuu

**8.Unaishi na nani wakati huu?**

a)Peke yangu

b)Na mtu mwingine/watu wengine

**9.Mapato yako ya kila mwezi ni kama?**

a)Sina mapato

b)Chini ya Sh.5000

c)Kati ya Sh.6000 na 10,000

d)Kati ya Sh.11,000 na 20,000.

e)Zaidi ya elfu 20,000

**10.Je,wewe umewahi tibiwa ugonjwa wa akili?**

a)Ndio

b)La

**11.Kuna mtu wa jamii yenu amewahi tibiwa ugonjwa wa akili?**

a)Ndio

b)La

**12.Ni aina gani ya gari ilihusika katika ajali uliyoipata?(yenye ilikuumiza)**

a)pikipiki

b)ngari ndogo

c)matatu/basi

d)gari la mizigo

e)ingine(taja)_____

**13.Ajali ya barabara uliipata muda gani uliopita?**

a)Kati ya mwezi mmoja na miezi miili

b)Kati ya miezi mitatu na miezi kumi na moja

c)Kati ya mwaka mmoja na miaka miili

d)Kati ya miaka mitatu na miaka mitano

e)Zaidi ya miaka mitano

**14.Ulikuwa kwenye nafasi gani katika ajali?**

a)Nilikuwa dereva wa gari

b)Nilikuwa abiria wa gari

c)Nilikuwa dereva wa pikipiki

d)Nilikuwa abiria wa pikipiki

e)Nilikuwa mpita njia

**15.Ajali ilifanyika saa ngapi?**

a)Usiku

b)Mchana

**16.Nini ilifanyika kwako baada ya ajali?**

a)Nililazwa hospitalini na kufanyiwa upasuaji

b)Nililazwa hospitalini lakini sikufanyiwa upasuaji

c)Nilienda hospitalini lakini sikulazwa

**17.Ni majeraha gani uliyoyapata katika ajali?(weka alama kwa moja au zaidi)**

a)Kuvunjika mguu/miguu

b)Kuvunjika mkono/mikono

c)Kuvunjika uti wa mgongo

d)Kuvunjika kiunoni

e)Kwingine(taja ni wapi)_____

**18.Je,ulikuwa umetumia pombe au dawa yoyote ya kulevya masaa 24 kabla ya ajali?**

a)Ndio

b)La

**19.Kama ndio,ni gani(weka alama kwa moja au zaidi)**

a)Pombe

b)Bangi

c)Miraa

d)Nyingine(taja gani)_____

**20.Je,umewahi kupata ajali ingine ya barabara hapo awali?**

a)Ndio

b)La

**IMPACT OF EVENT SCALE-REVISED**

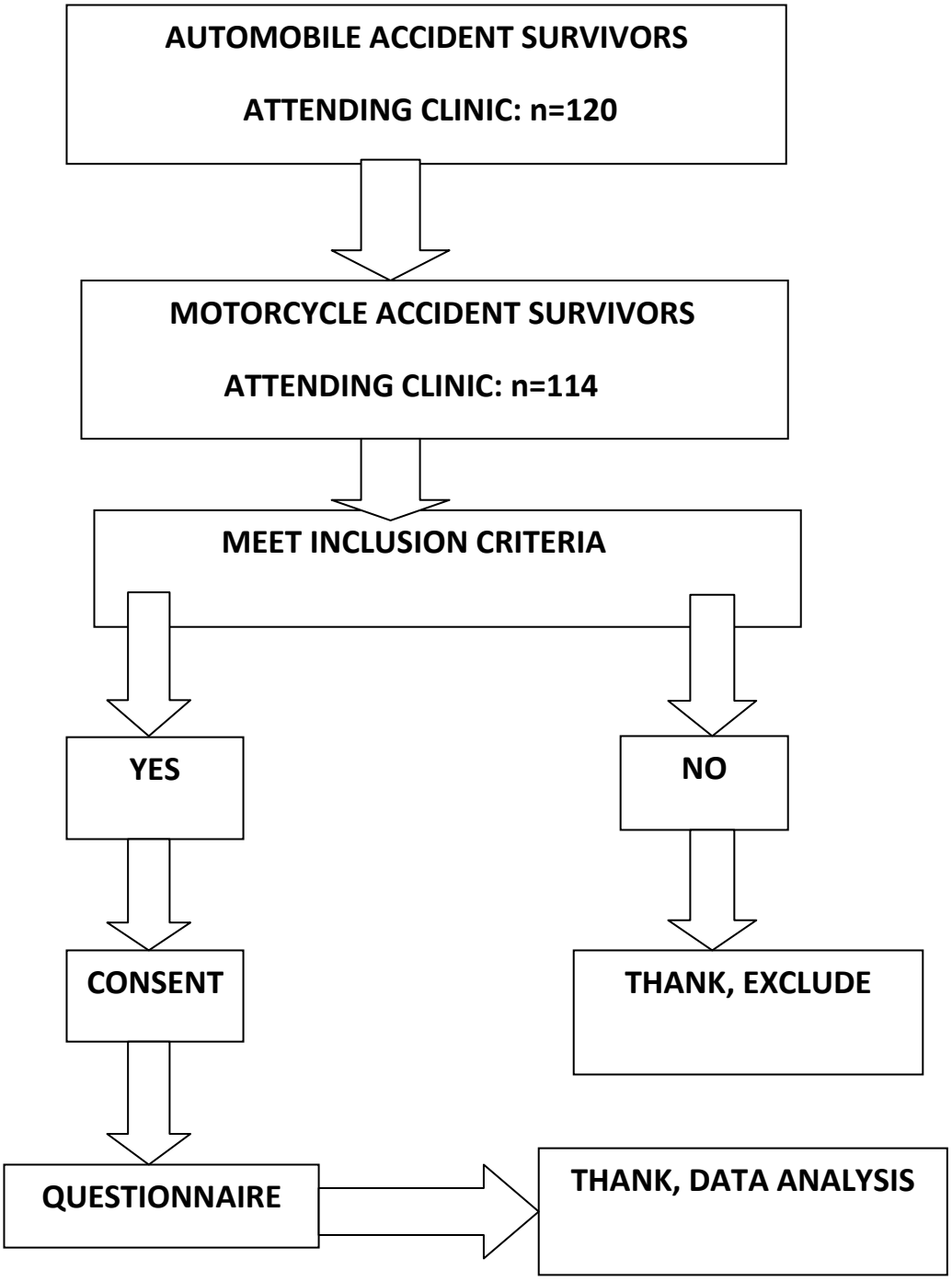
***Kipimo cha Athari ya Tukio - Iliyorekebishwa***

**INSTRUCTIONS:** Below is a list of comments made by people after stressful life events. Please check each item, indicating how frequently these comments were true for you **DURING THE PAST SEVEN DAYS** with respect to the event. If they did not occur during that time, please mark the "not at all" column.

***MAAGIZO**: Hapa chini ni orodha ya maoni yaliyotolewa na watu baada ya kupitia matukio ya dhiki ya maisha. Tafadhali weka alama ukionyesha ni mara ngapi maoni haya yalikuwa sawa na yako, **KWA MUDA WA SIKU SABA ZILIZOPITA** kuambatana na tukio hilo. Kama hayakutendeka kwako kamwe katika muda huo tafadhali weka alama kwenye sehemu ya "Kamwe".*

| | **Not at all** ***Kamwe*** | **A little bit** ***Kidogo*** | **Moderately** ***Kiasi*** | **Quite a bit** ***Zaidi*** | **Extremely** ***Zaidi mno*** |
|---|---|---|---|---|---|
| **1.** Any reminder brought back feelings about it. *Kumbusho lolote lilileta hisia kuhusu tukio hilo.* | 0 | 1 | 2 | 3 | 4 |
| **2.** I had trouble staying asleep. *Nilikuwa na shida kukaa usingizini.* | 0 | 1 | 2 | 3 | 4 |
| **3.** Other things kept making me think about it *Mambo mengine yalinifanya nifikirie tukio hilo.* | 0 | 1 | 2 | 3 | 4 |
| **4.** I felt irritable and angry. *Nilihisi kukosa utulivu na kuwa na hasira* | 0 | 1 | 2 | 3 | 4 |
| **5.** I avoided letting myself get upset when I thought about it or was reminded of it. *Nilijizuia kukasirika nilipofikiria tukio hilo au kukumbushwa kulihusu.* | 0 | 1 | 2 | 3 | 4 |
| **6.** I thought about it when I didn't mean to Nilifikiria tukio hilo bila kupenda | 0 | 1 | 2 | 3 | 4 |
| **7.** I felt as if it hadn't happened or wasn't real. *Nilihisi kama tukio hilo halikuwa limetendeka ama halikuwa la kweli.* | 0 | 1 | 2 | 3 | 4 |
| **8.** I stayed away from reminders about it. *Nilikaa mbali na jambo lolote ambalo lingenikumbusha kuhusu* | 0 | 1 | 2 | 3 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| *tukio hilo* | | | | | |
| **9.** Pictures about it popped into my mind.<br>*Picha za tukio hilo zilikuja akilini* | 0 | 1 | 2 | 3 | 4 |
| **10.** I was jumpy and easily startled.<br>*Nilikuwa sina utulivu na rahisi wa kushtuliwa.* | 0 | 1 | 2 | 3 | 4 |
| **11.** I tried not to think about it.<br>*Nilijaribu kutolifikiria.* | 0 | 1 | 2 | 3 | 4 |
| **12.** I was aware that I still had a lot of feelings about it, but I didn't deal with them.<br>*Nilijua bado nilikuwa na hisia nyingi kuhusu tukio hilo lakini sikufanya chochote kuzisuluhisha.* | 0 | 1 | 2 | 3 | 4 |
| **13.** My feelings about it were kind of numb.<br>*Hisia zangu kuhusu tukio hilo zilikuwa ni kama hazipo.* | 0 | 1 | 2 | 3 | 4 |
| **14.** I found myself acting or feeling like I was back at that time.<br>*Nilijipata nikitenda na kuhisi kama nilivyokuwa wakati wa tukio hilo.* | 0 | 1 | 2 | 3 | 4 |
| **15.** I had trouble falling asleep.<br>*Nilikuwa na shida kupata usingizi* | 0 | 1 | 2 | 3 | 4 |
| **16.** I had waves of strong feelings about it.<br>*Nilikuwa na vipindi vya hisia za nguvu kuhusu tukio hilo.* | 0 | 1 | 2 | 3 | 4 |
| **17.** I tried to remove it from my memory.<br>*Nilijaribu kuliondoa kwa kumbukumbu langu* | 0 | 1 | 2 | 3 | 4 |
| **18.** I had trouble concentrating<br>*Nilikuwa na shida kuwa makini* | 0 | 1 | 2 | 3 | 4 |
| **19.** Reminders of it caused me to have physical reactions such as sweating, trouble breathing, nausea, or a pounding heart.<br>*Makumbusho ya tukio hilo yalinifanya kuwa na mimenyuko ya kimwili kama vile kutokwa na jasho, shida kupumua, kichefuchefu, au mdundo wa moyo.* | 0 | 1 | 2 | 3 | 4 |
| **20.** I had dreams about it.<br>*Nilikuwa na ndoto kulihusu.* | 0 | 1 | 2 | 3 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| **21.** I felt watchful and on-guard. *Nilihisi kuwa macho na chonjo.* | 0 | 1 | 2 | 3 | 4 |
| **22.** I tried not to talk about it. *Nilijaribu kutozungumza kulihusu.* | 0 | 1 | 2 | 3 | 4 |

**APPENDIX 3: FLOW CHART**