DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

Signature ___________________________ Date 28/10/2016

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DEDICATION

Dedicated to all respondents with whom I interacted on accident trauma care.

Quick recovery and my best regards!
ACKNOWLEDGEMENT

I would like to acknowledge the unconditional academic guidance received from academic supervisors Dr. Daniel Akunga and Dr. Tom Were in directing the focus of this study from its conception to the final writing of this thesis. Great appreciation is extended to Dr. Linus Atisa who linked me with Kisii Level Five Hospitals’ management for permission to conduct the study in the Hospital. I am indebted to all the research assistants who helped in conducting interviews and all crash survivors for sharing information on their lives after road crashes. Special acknowledgement goes to Wilkistor Kerubo for study tool pretesting. Special gratitude go to Annan and Mandela for their moral support when it appeared to be tough.
# TABLE OF CONTENTS

**DECLARATION**......................................................................................................................... i  
**DEDICATION**............................................................................................................................ ii  
**ACKNOWLEDGEMENT**............................................................................................................... iii  
**LIST OF TABLES**.................................................................................................................. vii  
**LIST OF FIGURES**................................................................................................................... viii  
**OPERATIONAL DEFINITION OF TERMS**................................................................................... ix  
**ABBREVIATIONS AND ACRONYMS**....................................................................................... xi  
**ABSTRACT**.................................................................................................................................. xii  
**CHAPTER ONE: INTRODUCTION**............................................................................................. 1  
1.1 Background ............................................................................................................................. 1  
1.2 Statement of the Problem ......................................................................................................... 2  
1.3 Justification of the Study ......................................................................................................... 3  
1.4 Research Questions ................................................................................................................. 4  
1.5 Objectives of the Study ........................................................................................................... 4  
  1.5.1 Main Objectives of the Study ................................................................................................. 4  
  1.5.2 Specific Objectives of the Study ............................................................................................ 4  
1.6 Delimitations and Limitations .................................................................................................. 5  
1.7 Assumptions ............................................................................................................................ 6  
1.8 Conceptual Framework of the Study ...................................................................................... 7  
**CHAPTER TWO: LITERATURE REVIEW**.................................................................................. 10  
2.1 Introduction .............................................................................................................................. 10  
2.2 Socio-demographic Characteristics of RTI Survivors .......................................................... 10  
2.3 Psychological Trauma due to Road Accident ....................................................................... 11  
  2.3.1 Emotional and cognitive trauma .......................................................................................... 12  
  2.3.2 Depression and anxiety ....................................................................................................... 12  
  2.3.3 Substance misuse and insomnia .......................................................................................... 13  
2.4 Barriers to Road Accident Trauma Care .............................................................................. 13  
  2.4.1 Involvement of lay people in pre-hospital trauma care ......................................................... 14  
  2.4.2 Inadequate pre-hospital services .......................................................................................... 14  
  2.4.3 Shortcomings in road infrastructure .................................................................................... 15
4.3.1 Involvement of unqualified lay persons in rescue and basic trauma care .......... 37
4.3.3 Survivors and type of pre-hospital trauma care provider at scene of accident .... 38
4.3.4 Financial barriers to trauma care ..................................................................... 39
4.3.5 Delayed services, expensive drugs and inadequate medical providers ........... 41
4.3.6 Scene of accident crowd behaviour ................................................................. 42
4.3.7 Emotional state of care providers as a barrier to trauma care ....................... 42
4.3.8 Provider-patient communication .................................................................... 43
4.3.9 Place and time of accident .............................................................................. 44
4.4 Relationship between sociodemographic characteristics and Psychological Trauma .. 44

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS 46

5.1 Discussion ............................................................................................................ 46
5.1.1 Socio-demographic characteristics ................................................................. 46
5.1.2 Psychological trauma due to road accidents .................................................... 48
5.1.3 Barriers to road accident trauma care ............................................................. 51
5.1.4 Relationship between socio-demographics and psychological traumas .......... 54
5.2 Conclusions ......................................................................................................... 55
5.3 Recommendations .............................................................................................. 56
5.3.2 Areas for Further Research ............................................................................ 57
REFERENCES ............................................................................................................. 58
Websites ...................................................................................................................... 62

APPENDICES .............................................................................................................. 63
Appendix 1: Kenyatta University research authorization permit ................................. 63
Appendix 2: Kisii Level 5 research authorization letter .............................................. 66
Appendix 3: Interview schedule ............................................................................... 68
Appendix 4: Glossary of Traumatology short version .............................................. 73
Appendix 5: Map of Kisii County, Kisii Level 5 Hospital catchments ...................... 85
LIST OF TABLES

Table 4.1: Demographic characteristics of RTI survivors; disaggregated by type .......... 26

Table 4.2: Psychological trauma among the RTI survivors by category .................. 27

Table 4.3: Duration between occurrence of accident and study period ................. 35

Table 4.4: Barriers to road traffic injury trauma care by category ...................... 36

Table 4.5: Survivors and type of pre-hospital trauma care provider at scene of accident 39

Table 4.6: Relationship between socio-demographic characteristics and psychological trauma .......................... 45
LIST OF FIGURES

Figure 1.1 Conceptual framework.................................................................8

Figure 4.1 Flashbacks and replaying horrific memories..................................28

Figure 4.2 Proportion of survivors experiencing panicky and phobic travel anxiety....29

Figure 4.3 Proportion of patients expressing sleep disturbance .....................30

Figure 4.4 Proportion of patients expressing fear and refusal to board vehicles........31

Figure 4.5 Mode of transport to hospital after a road accident by type ...............38

Figure 4.6 Proportion who sold items to pay for RTI psychological trauma care....40

Figure 4.7 Proportion who borrowed to pay for medical care due to injury ..........40

Figure 4.8 Delayed services, expensive drugs and insufficient number of providers ....41
OPERATIONAL DEFINITION OF TERMS

**Accident:** Is an unfortunate incident that happens unexpectedly and unintentionally

**Black spot:** Is an engineering term to denote the section of a road network where traffic accidents were likely to occur compared to other spots on a road

**Golden hour:** A period within which treatment must be administered in order to avoid either loss of life or disablement in consequence of a particular injury

**Hotline:** Refers to the fastest communication channels at the disposal of accident survivors, and rescue team-connected to emergency care services for accident victims

**Lay persons:** These are untrained persons who are first responders to accident scenes for rescue mission and basic RTA trauma care

**Occupant:** A person operating or intending to operate or a person being carried (passenger) in any mechanically or electrically powered device used at the time primarily for conveying persons or goods from one place to another

**Pedestrian:** A person involved in an accident who was not at the time of the accident riding in or on any mechanically or electrically powered device

**Trauma care:** Any form of response provided to accident survivors following accidents.

**Trauma Centre:** A hospital that has additional resources and capabilities to care for severely injured patients

**Trauma:** In this study, trauma conflates emotional and physical injury responses to traumatic events and in this case, motor vehicle accidents
## ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ADB</td>
<td>African Development Bank</td>
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<tr>
<td>AIDS</td>
<td>Acquired Immuno-Deficiency Syndrome</td>
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<td>APA</td>
<td>American Psychological Association</td>
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<td>ASD</td>
<td>Acute Stress Disorder</td>
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<td>BLS</td>
<td>Basic Life Services</td>
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<td>DALY</td>
<td>Disability Adjusted Life Years</td>
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<td>EMS</td>
<td>Emergency Medical Services</td>
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<tr>
<td>GoK</td>
<td>Government of Kenya</td>
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<td>GNP</td>
<td>Gross National Product</td>
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<td>GRSPR</td>
<td>Global Road Safety Partnership annual Report</td>
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<td>GRSI</td>
<td>Global Road Safety Initiative</td>
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<td>GRSP</td>
<td>Global Road Safety Partnership</td>
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<td>HIC</td>
<td>High Income Countries</td>
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<tr>
<td>HIV</td>
<td>Human Immuno-deficiency Virus</td>
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<tr>
<td>ICD-10</td>
<td>International Classification of Mental and Behavioral Disorders version 10</td>
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<tr>
<td>ICU</td>
<td>Intensive Care Unit</td>
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<tr>
<td>IPA</td>
<td>Interpretative Phenomenological Analysis</td>
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<td>IPC</td>
<td>Interpersonal communication</td>
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<tr>
<td>KU</td>
<td>Kenyatta University</td>
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<td>KNRS</td>
<td>Kenya National Road Safety</td>
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<td>LIC</td>
<td>Low Income Countries</td>
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<td>MIC</td>
<td>Middle Income Countries</td>
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<tr>
<td>NAEMT</td>
<td>National Association of Emergency Medical Technicians</td>
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<td>NHTSA</td>
<td>National Highway Traffic Safety Administration</td>
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<tr>
<td>PCM</td>
<td>Post Crash Management</td>
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<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>PCT</td>
<td>Personal Constructs Theory</td>
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<td>PGS</td>
<td>Post Graduate School</td>
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<td>PTSD</td>
<td>Post Traumatic Stress Disorder</td>
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<td>PSVs</td>
<td>Public Service Vehicles</td>
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<tr>
<td>RTAs</td>
<td>Road Traffic Accidents</td>
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<td>RTIs</td>
<td>Road Traffic Injuries</td>
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<tr>
<td>SDC</td>
<td>Social Demographic Characteristics</td>
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<tr>
<td>SQKM</td>
<td>Square Kilo Meter</td>
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<td>WHO</td>
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ABSTRACT

Road traffic injuries, (RTIs) are a recognized cause of physical injuries, disabilities, mental trauma and death making it an important public health problem. Globally, RTIs are projected to become the third leading cause of loss of healthy life and disease burden by 2030, yet health care systems are inadequately prepared for this challenge. Kenya is one of the countries with high RTI burden, with over 3,000 people dying annually and survivors exerting huge burden on the health care system. Therefore, the study recruited 191 in and out patients RTI survivors to study psychological trauma and barriers to care. Physical injuries of RTIs are known. However, the burden of psychological trauma and barriers to care in Kisii County are largely unknown. This was a cross-sectional hospital based study targeting survivors above 18 years of age. The Hospital was purposefully chosen as it serves as the hospital of choice for RTI trauma care. Kisii County was chosen because it has 8 of the 11 major accident black-spots in Nyanza. The study focused on documenting social demographic characteristics, psychological trauma and barriers to trauma care as well as establishing the relationship between socio-demographics and psychological trauma. Data were collected by use of interview schedule and observational checklist. It was entered into MS Excel database and analyzed using SPSS version 15.0 statistical software. Linear chi-square was used to test for levels of significance. Thematic analysis for qualitative data used interpretative phenomenological analysis based on personal constructs theory. More males than females suffered the blunt of road accidents at 67% and 33%, respectively. Majority were aged 21-49 years old, a population that was economically productive. 70% were married; 68% had at least secondary school level of education; 52% were in informal and 18% formal employment. Overall, survivors experienced various psychological traumas: 94% had flashbacks and horrific memories; 91% had travel anxiety and panicky tendencies; 87% insomnia and 86% exhibited avoidance to board automobiles. Equally, survivors encountered various barriers to trauma care, with 89% transported to hospital in public transport; 80.1% received trauma care from lay persons. Cumulatively, 78% had trauma services delayed; 70% sold investments and 56% borrowed to pay for trauma care. Chi-square tests showed that avoidance behavior and travel anxiety were more significant in out-patient than in-patients; ($\chi^2 = 3.8$, df = 1, $p = 0.001$). It also showed that RTI psychological trauma was significant in survivors with at least secondary level of education compared to primary level; ($\chi^2 = 4.1$, df =1 and $p = 0.001$). Altogether, RTIs are major health and economic burdens. Overall, married, economically active men aged 21-49 suffered the blunt of RTIs. These study results will stimulate interest for further research in RTI psychological trauma in other regions. Kisii County and elsewhere will use data to develop RTI trauma care policy. Ministry of Health will utilize the data for health promotion. Eventually, RTI Trauma care will be optimized thus improved health care for injury survivors.
CHAPTER ONE: INTRODUCTION

1.1 Background

Road Traffic Injuries (RTIs) are increasingly becoming an important public health burden at global, regional and national levels (Peden, 2005; Chalya et al., 2012; Bachani et al., 2012 & Peden; Kobusingye, & Monono, 2013). Globally, over 20 to 50 million people suffer from RTIs with over 1.2 million deaths annually (Akama, Chindia, Macigo, & Guthua, 2007; Toroyan, Peden, & Iaych, 2013). In 2004, it is estimated that RTIs contributed to 2.7% of the Total Disability Adjusted Life Years (DALYs) lost globally. This means that unless action is taken, this proportion is expected to rise to 4.9% by the year 2030, to position RTIs as the third leading contributor to global burden of disease (Hyder, 2004; Mathers & Loncar, 2006; Bachani et al 2012).

Up to 70% of the many lives lost every year could be saved and disability prevented if rapid and competent post-crash care were available at the crash scene (Davis, Kuhns, & Watson, 2004; Khorasani-Zavareh et al., 2009). However, studies have shown that professional care arrived late, therefore confirming that there were barriers to RTI trauma care (Mock, Tiska, Adu-Ampofo, & Boakye, 2002; Kaushal, 2013). After accidents, survivors and their dependents often experience short and long-term traumatic experiences (Chandran, Hyder, & Peek-Asa, 2010). In Kenya, over 28% of reported accidents are fatal translating to over 3,000 deaths and thousands maimed annually (Chandran et al., 2010; Bachani et al., 2012). This not only causes physical trauma but also socio-economic trauma to survivors and therefore costing the country 8% to 9% of its GDP (Peden et al., 2013). The Kenya National Road Safety (KNRS) data for 2004-
2009, showed that road crash deaths occurred most among men and that the highest impact was on the economically active age ranges of 15-45 years (Odero, Khayesi, & Heda, 2003; Asingo, 2004; Bachani et al. 2012).

Since Chesser's (1981) publication in which she identified a lack of research in the area of psychological trauma, there still appears to be a significant gap in literature that explores the psychological perspective of road traffic accident survivors (Chalya et al., 2012). Published studies conducted in Nairobi as hospital record reviews are inadequate in details on the psychological effects of RTIs (Osoro M.E, et al. 2011). This is, in part, because these studies had used quantitative designs that had helped to quantify needs more than to obtain new perspectives (Mock et al., 2002). These limitations have contributed to inadequate knowledge on the magnitude and effects of RTIs (Nantulya et al., 2003; Odero, Khayesi, & Heda, 2003). This therefore, could be interpreted to mean that the current road accident trauma care system is narrow in its approach and is limited to the available data, especially without survivors’ perspectives, who are the major stakeholders in trauma care.

1.2 Statement of the Problem

Globally, despite research suggesting a high prevalence of RTIs and the related mental health consequences, the area has been inadequately studied in developing nations (Wisborg, Montshiwa, & Mock, 2011). Therefore, the knowledge base is still limited and inconsistent (Borse & Hyder, 2009). Similarly, there is inadequate literature on barriers to road accident trauma care from survivors’ perspective (Khorasani-Zavareh et al., 2009). This could be attributed to use of quantitative methods, which tell us very little about the emotional and psychological trauma (Sara B. R., 2007). In developed nations,
knowledge on socio-demographics and psychological effects of accidents are fairly documented but little was known on the same in Kenya and Kisii County.

1.3 Justification of the Study

Road Traffic Accident (RTAs) prevention and injury trauma care require data (Peden, 2005; Bhatti & Salmi, 2012). There are calls for countries to develop post-accident trauma care systems (Meddings; 2007; Toroyan et al., 2013). However, though Kenya has put in place many road infrastructure policies and safety measures (Odero et al., 2003), due to historical RTA trends and current economic challenges, a comprehensive trauma care system has not been realized (Nesoba D., 2010).

Majority of available studies in Kenya had focused on causes of road accidents and road users' behavior (Meddings, 2007; Bachani A et al 2012). They mostly used quantitative methods and generally lend themselves to more formal physiological and pathological diagnostic categorization of injuries with limited mention of psychological effects. Quantitative methods tend to lack the informative richness and depth found in qualitative approaches such as interpretative phenomenological analysis (Kupersmith et al., 2007), therefore a qualitative approach to this study. Moreover, none of these studies had focused on psychological effects from accident survivors' perspectives.

It's believed that road accident survivor's views are important when designing injury surveillance systems, accident prevention strategies and trauma care models (Khorasani-Zavarch et.al., 2009; Rezapur-Shahkolai, Naghavi, Shokouhi, & Laflamme, 2008). With these findings, RTI survivors will benefit from a more comprehensive trauma care, therefore, this study. Kisii County was appropriate for this study because it
has 8 of the 11 major black spots in major roads in Nyanza (http://www.kenyapolice.go.ke).

1.4 Research Questions

1. What are the socio-demographic characteristics of RTI survivors at Kisii Level Five Hospital?

2. What types of psychological trauma do RTI survivors at Kisii Level Five Hospital present with?

3. What barriers to RTI trauma care are reported by survivors at Kisii Level Five Hospital?

4. What relationship exists between socio-demographic characteristics and psychological trauma of survivors at Kisii Level Five Hospital?

1.5 Objectives of the Study

1.5.1 Main Objectives of the Study

The study aimed at documenting the social demographic characteristics of RTI survivors, explore their lived experiences to acquire ‘new’ perspectives on psychological trauma after a RTA, document barriers to trauma care and the relationship between social demographic characteristics and psychological trauma of the survivors.

1.5.2 Specific Objectives of the Study

1. To establish the socio-demographic characteristics of RTI survivors at Kisii Level Five Hospital.
2. To describe RTI related psychological trauma among survivors at Kisii Level Five Hospital.

3. To identify barriers to RTI trauma care reported by survivors seeking care at Kisii Level Five Hospital.

4. To establish the relationship between socio-demographic characteristics of survivors and psychological trauma at Kisii Level Five Hospital.

1.6 Delimitations and Limitations

These findings are subject to some strengths and weaknesses. The study is one of the few trauma care related studies in Kenya, adopting mostly Interpretative Phenomenological Analysis (IPA) in qualitative techniques to investigate in-depth perspectives to road accident psychological effects on survivors and barriers to trauma care. The study focused on RTI survivors' 'subjective' interpretations of their 'new' state of life vis a vis the 'normal' world after a road crash. Therefore, a potential strength of this study is that all of the variables were self-reported thus a true picture of the situation.

Despite the positive semi-structured conceptualizations of IPA, Willig (2001) suggests that IPA may not adequately capture participants' views or experiences as it is dependent on language to sufficiently communicate those views and experiences. Some participants may have found it difficult to find the right words to express themselves, therefore, questioning the validity of an IPA analysis. However, this critique would also apply to other qualitative and quantitative methods, whereby peoples' experiences are categorized to fit with pre-existing conceptualizations of experience, (e.g. tick boxes) as
they tend to ‘lose’ the experiences of the subject by operating at a more theoretical level, driven by a methodological focus (Crossley, 2000).

Though also seen as an open bias, care was taken to minimise it by comparing themes from other survivors’ stories involved in similar but different road crashes. Above all, the study was original. Identification of respondents and creating rapport with them took time. These was interpreted in the context of them as having been through a life-threatening incident and were still in paining conditions which often led to changes in moods or willingness to discuss about the accident.

Due to resource constrains and time factors, the scope of the study were narrowed to one hospital’s RTI survivors. This single hospital data is a source of selection bias and not representative of all road traffic injuries in the region. The study did not attribute each category of barriers to trauma care and psychological trauma to any specific road users. It is likely that some survivors chose to be treated at private facilities and therefore could not be captured in this study. Conclusion and recommendations of the study might be skewed given that this was a one hospital data as crash survivors seeking care in other hospitals were not captured.

1.7 Assumptions

Based on a national prevalence of 28% representing fatal outcomes of all road crash in Kenya (Bachani et al., 2012), the study assumed that Kisii Level Five Hospital received about 119 road crash survivors in a month to allow for a representative sample size. It assumed that all RTI survivors in the region sort trauma care from Kisii Level Five Hospital. It also assumed that all participants would voluntarily provide private and
personal information about their experiences. That hospital authorities and trauma care providers would enthusiastically support the patients and allow them private time to take part in the study. The researcher assumed that by explaining the purpose of the study would be enough rapport to access respondents. That Hospital management would not be bothered as long as one had a permit to interview patients. All these turned to be the opposite. The Hospital management wanted to understand how they could improve and contribute to this research.

Therefore, to assure and ease the concerns by management the researcher drafted a cover letter seeking permission to conduct the study. Together with the letter, the researcher provided a summarized document providing the background information about trauma care, the purpose and objectives of the study. This was preceded with a face to face presentation of the proposal to the research and training committee of the hospital. These processes were critical and helped to develop and maintain a productive and mutually satisfying research relationship with hospital management, study participants and front line trauma care workers. The face to face meeting helped to reduce the researcher’s fears that the study population might be perceived as reporting ‘mismanagement’ by care providers. This way the researcher became conscious of the sensitivity around trauma care questions and their implications if trauma care providers were not clear of the objectives of the study.

1.8 Conceptual Framework of the Study

The study was guided by a re-redesigned (Khorasani-Zavareh et al., 2009) conceptual framework and variable established using the Personal Construct Theory (PCT) (Janoff-Bulman, 1992). The personal construct theory examines how people
interpret and make sense of the world and how they predict the future based on their previous experiences, basing that upon their particular interpretation of an event.

**INDEPENDENT VARIABLES**
- Social Demographics:
  - Age
  - Sex
  - In-patient
  - Out-patient
  - Income
  - Marital status
  - Education level
  - Occupation
  - Residence

**INTERVENING FACTORS:**
- Barriers for RTA trauma care
- Involvement of lay persons in rescue and basic trauma care
- Mode of transport to hospital
- Financial constraints
- Delayed services and expensive and inadequate medical providers
- At scene of accident crowd behaviour
- Emotional state of care providers
- Provider-patient communication
- Place and time of accident

**DEPENDENT VARIABLES:**
- RTA Psychological Trauma
- Phobic travel anxiety and panicky experiences
- Insomnia
- Avoidance behaviour
- Flashbacks and horrific memories
- Overwhelming emotions and memory relapses
- Feelings of guilt and self blame
- Nightmares

**Personal Construct Theory (PCT) (Janoff-Bulman, 1992):** The theory postulates that people make sense of the world and predict the future based on their previous experience

**Figure 2.1. Conceptual framework**

Adapted and redesigned from (Khorasani-Zavareh et al., 2009) post-crash management of road traffic injury victims in Iran, the framework provides the study variables. The left hand box shows independent variables; social demographic characteristics; age, sex, in-patient, out-patient, income, marital status, education level, occupation, residence and income of the study participants. The middle box shows intervening factors: barriers to RTIs trauma care. These barriers include behavior of bystanders and overcrowding at the scene of accident; involvement of unqualified persons in rescue and care- poor handling of crash survivors; evacuation and type of
transport to hospital; emotional state of care providers, poor provider-patient communication and financial difficulties - borrowing and/or selling to pay for trauma care. The right hand box shows dependent variables: 'silent' psychological and emotional trauma; phobic travel anxiety and panicky experiences, fear and refusal to board a vehicle, nightmares and flashbacks related to RTIs, feelings of guilt, difficulties to concentrate and keep attention and loss of memory and inability to recollect facts. The Iran model did not include the psychological consequences of RTIs which were added in this theoretical framework. From the framework, one could conclude that the determinants of RTA outcomes and management were multi-factorial.
CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter contains trends from reviewed literature on previous studies on road traffic injuries. It identifies the gaps that this study attempted to fill.

2.2 Socio-demographic Characteristics of RTI Survivors

Despite the everyday occurrence of RTAs, literature search has revealed a massively disproportionate amount of research paid to the psychological consequences of man-made and natural disasters (Krug, Sharma, & Lozano, 2000; Galea, Nandi, & Vlahov, 2005; Whalley & Brewin, 2007), in comparison to everyday traumatic events such as road accidents. Globally, over 2.1 million working occupants of vehicles that crashed in 2001 lost a total of 60 million days of work, resulting in annual productivity losses of over $7.5 billion (Ebel, Mack, Diehr, & Rivara, 2004). In North America and other developing world, majority who were affected by vehicle crashes were drivers of cars and occupants of commercial vehicles, pedestrians and young people (Krug et al., 2000). The prevalence of crash-related disability was highest for persons in their mid-life years, ages 35-64 (Shults, Jones, Kresnow, Langlois, & Guerrero, 2004).

Regionally, Kenya was among African countries that bore the blunt of the fatalities and disabilities. In a 1998 study comparing mortality due to RTIs in 12 countries, Kenya had the highest RTI fatality rate, 1.6 times higher than that for Zimbabwe, 3.6 higher than Chile, and 48.9 than Great Britain (Jacobs, 2000). The Kenya National Road Safety (KNRS) data for 2004-2009, road accident deaths occurred among
men. The highest impact is on the economically active age ranges of 15-45 years (Odero et al., 2003; Wisborg et al., 2011; Bachani et al., 2012)

A study on the severity of road traffic injuries at Thika District Hospital showed the mean age of victims was 32.4 years. Three quarters were between 20-49 years-old and 73% and 27% were male and female respectively. Approximately half had at least primary level education (Mogaka, Ng’ang’a, Oundo, Omolo, & Luman, 2011). However, in Kisii County, the socio-demographic data is currently not well known, yet the county is expected to design a trauma care system to respond to the needs of RTI survivors. On this basis, this study was instituted with anticipation of informing crash prevention and care processes.

2.3 Psychological Trauma due to Road Accident

The concept of psychological trauma has evolved over the 20th century. The term ‘trauma’ stems from the Greek word meaning ‘a piercing of the skin, a wound’. Freud, (1920) used the word metaphorically to illustrate how the mind, being a protective shield to the skin, could also be pierced and wounded by experiences.

Research in the field of trauma has shown that accidents can lead to the onset of an array of psychiatric disorders (Sara B., 2007). Research in the 1980’s and 1990’s reflected a dominant interest in what was then a new disorder: Post-traumatic Stress Disorder (PTSD), first officially recognized in the Diagnostic Statistics Manual of Mental Disorders, third edition (DSM-III; American Psychiatric Association of 1980s prior to ‘Acute Stress Disorder’ (ASD) category, the only other stress-related diagnosis was the non-specific diagnosis of adjustment disorder (American Psychiatric Association, 2013). Since then, the word has become frequently used in modern western societies to mean a
highly stressful ‘event/situation’ that overwhelms an individual’s ability to cope (Janoff-Bulman, 1992; McEvoy et al., 2005). From a psychodynamic perspective, a traumatic event is one that breaks through, or overrides the mind’s filtering process and floods the mind with a degree of stimulation that it cannot manage. It causes a colossal disruption in functioning, amounting to a kind of breakdown. This leaves individuals vulnerable to intense overwhelming anxieties from internal sources which have been provoked by an external event (American Psychiatric Association, 2013). On the account of this study, it’s important to emphasize that, it is an individual’s subjective experience that determines whether an event is traumatic, or not. According to the International Classification of Mental and Behavioral Disorders (ICD-10), the cardinal triad of symptoms recognized as post-traumatic stress disorder (PTSD) following accidents include: re-experiencing, numbing, avoidance and hyper-arousal (McNally, 2003).

2.3.1 Emotional and cognitive trauma

The Diagnostic Statistics Manual of Mental and Behavioral Disorders, third edition (DSM-III; American Psychiatric Association of 1980, suggests that trauma involves witnessing or experiencing actual or threatened death or serious injury (McNally, 2003). After road accidents, the injured individual feels emotionally, physically and cognitively overwhelmed.

2.3.2 Depression and anxiety

According to Personal Construct Theory (PCT), the injured may also develop psychological disorder such as depression or anxiety. This effect is considered to be ‘a failure to revise ‘constructions’ in response to invalidation’ and get reconnected to real world (American Psychiatric Association, 2013).
2.3.3 Substance misuse and insomnia

Besides post-traumatic stress disorder, trauma-related diagnosis, ‘Acute Stress Disorder’ (ASD) was included in the Diagnostic Statistics Manual of Mental and Behavioral Disorders of 1994, to describe ‘pathological’ responses following an event. Drug abuse and lack of sleep have been implicated as some of the pathological responses in the psychological aftermath of RTAs (Schnyder, Moergeli, Trentz, Klaghofer, & Buddeberg, 2001).

2.4 Barriers to Road Accident Trauma Care

The capacity to provide a basic level of combined lay and technical rescue and medical care are inadequate in many parts of the world (Khorasani-Zavareh et al., 2009). Red Cross and Crescent estimates that of all victims who are killed, 57 per cent die in the first minutes after the crash, before the arrival of the emergency services (www.aar.org). In order to optimize RTA trauma care, Ghana, which lacked a proper ambulance service, was targeting first-aid training at drivers — usually the first people to arrive at the scene of an accident (Mock, Quansah, Goosen, & Kobusingye, 2014). In Kenya, efforts are towards providing emergency services and trauma care by having ambulance services in every county. However, despite these efforts, still rescue efforts are largely by untrained, at the scene first responders (http://www.kenyapolice.go.ke; http://www.wisegeek.com). Much of the available literature on barriers to trauma care is on structural, medical supplies and human capacity from various professionals’ views (Khorasani-Zavareh et al., 2009). These limitations informed the design of this study to identify ‘new’ perspectives from RTI survivors,
which was missing in Kisii County. African Air Rescue (AAR) recognizes that 70% to 80% of fatalities attributed to accidents could be prevented if immediate professional trauma care was provided. However, this is not the case due to many barriers (Toroyan & Peden, 2009; www.aar.org).

2.4.1 Involvement of lay people in pre-hospital trauma care

The involvement of untrained lay people, usually first responders including other drivers in rescue and trauma care at crash scenes leads to secondary injuries. Delay in arrival of the emergency professional services leads to overcrowding at crash scenes. These crowds hinder rescue missions, leading to indirectly increasing injury morbidity and mortality (Khorasani-Zavareh et al., 2009). In Kenya the first response to disaster scenes has been by untrained people, hence a barrier to pre-hospital trauma care.

2.4.2 Inadequate pre-hospital services

Globally, inadequate systematic approach to post-crash management (PCM), which include coordinated ambulance dispatch sites; existence of parallel organizations with the same activity; substandard telecommunication equipment; all hamper coordination and cooperation among the organizations (Khorasani D. et al 2009). Kenyan health care system is over-stretched, under resourced and un-equitably distributed. Equally, inadequate human resources and inadequate formal training and insufficient equipment often lead to in-effective post-crash management (Khorasani D. et al 2009; Kobusingye, & Monono, 2013). Kisii County health facilities including Kisii Level Five Hospital, a major trauma care referral hospital, are under equipped. Given the magnitude of RTIs, this could mean serious hindrance to adequate pre-hospital services.
2.4.3 Shortcomings in road infrastructure

Poor road network constitute an important barrier to quick RTI care. Poor survivor transportation when ambulances are not available delays trauma care. It is suggested that one emergency lane in urban roads would improve response (Khorasani-Zavareh et al., 2009). That lane would be more useful in crash black spots for ambulances to access crash scenes with ease. Kisii County lacks such an infrastructure. A large part of the county’s roads are not all-weather roads as only about 150 KM of roads are of Bitumen Surface (Yitambe, Mwanzo, & Mogere, 2005; Opano, 2013). With these facts, infrastructure was assumed to be among the barriers to trauma care in the county, which the study wanted to confirm.

2.4.4 Lack of integrated trauma system

The World Health Organization (WHO) sets guidelines for an integrated post-crash trauma care system. It suggests basic equipment needed to perform emergency trauma care (Borse & Hyder, 2009). In Africa, there is limited literature with sufficient information on trauma care preparedness to allow the development of a “best practice” model in Kenya (Bachani et al., 2012). With calls to develop trauma care centers, Kisii County was assumed to be way far below these basic required standards. Therefore, more data was needed to inform a trauma care model in the county, hence this study. If that was achieved, the county would contribute to a global total of 50% reduction in RTI fatalities (Hijar, Vazquez-Vela, & Arreola-Risa, 2003; Lormand, Sasser, Prevention, Kellermann, & Varghese, 2005).
CHAPTER THREE: MATERIALS AND METHODS

3.1 Research Design

This was a hospital based cross sectional study (Ulin, 2002; Donnelly, 2006; Ramalho, Adams, Huggard, & Hoare, 2015). The exploratory nature of the study and aims dictated an idiographic phenomenological and person-centered research design. Phenomenological investigations are concerned with attempting to record the individual’s subjective account of reality rather than an objective ‘reality’ itself. Qualitative approaches were preferred because of the “thick” verbal descriptions of personal perspectives and experiences with accident trauma. It is a suitable approach as it illuminates the “invisibility of everyday life” and “hidden” trauma based on survivors’ in-depth perspectives on the subject. Qualitative methods give a voice to survivors, especially drivers who have caused and feel responsible for another person’s death (Devers & Frankel, 2000). First-hand accounts of personal experiences with accidents deepen awareness of the impact and consequences of being involved in accidents. They provide a powerful understanding of people’s lived experiences following a fatal road traffic accident.

3.2 Variables

3.2.1 Dependent variable

Dependent variables for this study are road accident outcomes. These are the forms of mental/psychological/ emotional traumas.

3.2.2 Independent variables

These included socio- demographic characteristics- sex, age, and type of patient, level of education, occupation, income and residence.
3.3 Location of Study

The study was done in Kisii County, Kisii level Five Hospital. The hospital is a major referral facility for the catchment areas. The County is located to the south east of Lake Victoria and is bordered by six counties; Narok to the south, Migori to the west, Homa Bay to the north west, Kisumu to the north, Bomet to the south east and Nyamira to the east. The county covers a total of 1,317.4 square KM, with a road network composed of Bitumen Surface about 150 KM and Gravel and Earth Surface of about 565 Km (http://www.kenyamunya.com). The county has 8 of the 11 major black spots in major roads in Nyanza (http://www.kenyapolice.go.ke). This county is served by organized, SACCO based *matatus* and private transport providers (http://www.flickr.com).

The county, climatically has two rainfall seasons; short rainfall in September – November and long rains February – June. The rain is approximately over 1,500mm per annum with temperatures ranging from 16°C to 27°C. Socio-economically, Kisii County is endowed with main activities; including banking, subsistence and commercial agriculture, soft stone carving industry, education and training. There are over 8 big markets that attract people for trade (http://softkenya.com).

The County has a total population of about 1,152,282 with male population accounting for 48% and female 52%. It has an annual population growth rate of 2.75. It has over 245,029 households with a population density of 874.7 people per Square Kilo Meter. The age distribution of residents: 0-14 teens make 45%, 15-64 years make for 51.6%, 65+ years is 3.4% of the population. Over 51% of the populations live below the poverty line. (http://www.kenyamunya.com).
The major disease conditions in the region include; Malaria, HIV and AIDS, Pneumonia, diarrhea and pulmonary and respiratory infections. Due to fast urbanization, population growth and road infrastructure improvement, there has been steep increase of two wheeler motorcycles which could be considered as a major predisposing factor to motorized injury and disease burden in the county.

3.4 Study Population

The study targeted male and female road crash survivors above 18 years old. These participants represent varying experiences and unique perspectives on what takes place at the crash scene and thereafter. They were recruited as in and out-patients. Based on the sample size calculation, the study targeted a minimum of 119 participants. However, the study attained a 160.5% response rate, with a total of 191 participants interviewed.

3.4.1 Inclusion criteria

Injury survivors above the age of 18 years were included in the study. In-patient survivors willing to participate, revisiting out-patient survivors willing to participate and survivors involved in road crash prior and within the study period were also included.

3.2.4 Exclusion criteria

The study excluded in-patient survivors who had been prescribed narcotic analgesia, those who had sustained major injuries and admitted to intensive care unit (ICU). It also excluded in and out-patient survivors who declined to participate, those below the age of 18 years and survivors of other accidents- like fire burns, falls and crime were excluded.
3.5 Sampling Techniques and Sample Size

3.5.1 Sampling Techniques

This study used purposive sampling technique to identify a closely defined group for whom the research question would be significant (Lisa, 2008). The sampling technique involved combining qualitative and quantitative techniques to answer research questions. The process involved cluster sampling technique by dividing participants into in and out-patients. Criterion sampling technique was used to screen for non-traffic accident survivors who did not meet the inclusion criteria like age and type of injury. Purposive sampling was appropriate as it gave the researcher room to deliberately select RTJ survivors with important information that could not be gotten from any other choices, within Kisii level Five Hospital sampling frame. These techniques provided the researcher with the justification to make generalizations from the sample even if the participants are not representative of the population (Devers & Frankel, 2000). Therefore, mixed method sampling techniques advanced the research far better than any randomly road crash patient chosen from the sampling frame.

3.5.2 Sample Size

Sample size (n) also called “power analysis” is the ability of a study to avoid type II error, which is usually a hidden error as it can’t be detected without a proper power analysis. Therefore; assuming a standard error of 10% at 95% confidence interval, the sample required for this study was determined as follows (Fisher, et.al. 1998).

\[
\text{Sample size, } n = \frac{Z^2pq}{d^2}
\]

\[
(1.96)^2 \times 0.28 \times 0.72 = 310
\]
(0.05)^2

Where;

\( z \) = is the standard normal deviation at the required confidence level of 95%.

\( p \) = is the proportion of targeted survivors estimated to have the characteristics being measured. Usually, estimation from previous studies or estimated from preliminary data. In this case- 28% (0.28) of accidents in Kenya are fatal and therefore not eligible.

\( p = 1- p \); the estimated proportion of population eligible for the study. In this case; 72% (0.72) non-fatal cases

\( d \) = Level of statistical significance.

Therefore; \( n = 310 \) minimum desired sample size but only when the population size is greater than 10,000 to allow for representation and extrapolation to the population size.

However, at Kisii Level Five Hospital, the population affected by RTAs is less than 10,000.

Therefore, to adjust for this population size of less than 10,000 the study used;

\[
\begin{align*}
\text{nf} &= \frac{N}{1+n-1/N} \\
\text{nf} &= \frac{191/1+190/310} \\
\text{nf} &= 191/1.6 = 119 \\
\text{nf} &= 119 \text{ respondents}
\end{align*}
\]
3.6 Construction of Research Instruments

World Health Organization’s trauma care research guidelines (Trauma, et al. 1993) were adopted to inform the development of the study tool based on the study objectives and the study’s conceptual framework.

3.7 Study Tool Pre-test

A pre-test of the research tool was done in Nakuru level Five Hospital which had similar characteristics to those of Kisii Level Five respondents. The tool was administered to 4 patients; 2 in-patients male and female and 2 outpatient- male and female. Three of the respondents completed the interview between 45-70 minutes. One respondent ended the session prematurely after she was overwhelmed emotionally. The specific question on what her role was during the crash was dropped to avoid similar incidents. The rest of the questions were okay.

3.8 Validity and Reliability

3.8.1 Validity

The study tool’s validity was ensured on the basis of the study objectives and in-depth literature review and intensive consultations with research supervisors. After interviews were completed, interviewers offered respondents opportunity to validate accuracy of the verbatim responses. They also debriefed at the end of the day with the principal researcher and compared field notes. Further, data was validated using constant comparison analysis by the researcher, carefully examining unusual or contradictory results (outliers) for explanations. This involved reading and re-reading the data forms in order to verify the data for development of analysis themes. All these helped to increase validity.
3.8.2 Reliability

The research assistants were trained on the use of the tool, pre tested and corrected to remove ambiguities. Since data sources were ‘real-world’ situations as described by injury survivors, to give meaning to findings, great care was taken to ensure representativeness of the respondents to make generalization. After cleaning for accuracy, data was entered into an excel data base.

3.9 Data Collection Techniques

The study used a semi-structured interview schedule and interviewer administered technique (Devers & Frankel, 2000; Biggerstaff & Thompson, 2008). The process took a paper-and-pencil response recording approach. This approach was considered appropriate as it generates greater flexibility and opportunity to produce richer information than traditional structured techniques. It also allows the interview to be ‘person centered’ and participants to be the ‘experiential experts’ and guide the interview into new emerging areas not previously well known (Beck & Coffey, 2007). Interviews began with general questions, gradually progressing to more specific ones. Probing was performed according to the reflections of each participant, concerning prior experiences of the post-crash event; psychological effects and their perception about barriers to trauma care. Observation technique (Devers & Frankel, 2000), with an observation checklist was used to record bodily language that could be used to describe expressed ‘hidden’ traumas not verbally shared. The observation technique focused on the patients’ reactions, reflex responses and concentration span while discussing post-crash events. Interviews were in English and Kiswahili and sometimes clarification made in Ekegusii (local language)- for
Ekegusii speakers, recorded in descriptive and reflective notes, then transcribed verbatim and summarized in English.

3.10 Methods of Data Analysis

After coding and ensuring accuracy, quantitative data on background variables was entered in Microsoft excel XL windows 7 Microsoft Corp., USA and later exported into SPSS for windows version 11.5 (SPSS Inc., Chicago, Illinois) for descriptive statistical analysis. Pearson's linear chi-square test for levels of significance was done to establish if there were any relationships between social demographic characteristics and psychological traumas.

Thematic analysis was used to analyze and categorize psychological trauma and barriers to trauma care. The Interpretative Phenomenological Analysis (IPA) tool for qualitative data was used to develop themes and constructs for psychological trauma. IPA is a tool and method which attempts to tap into a natural propensity for self-reflection on the part of the participant (Kupersmith et al., 2007). It aims to explore the participant’s subjective view of the world, their lived experience and as far as possible attempts to gain an ‘insider’s perspective’ (Smith, J. A., & Osborn, M. (2008). The Interpretative Phenomenological Analysis (IPA) framework was deemed better suited to accessing participants ‘lived-worlds’ rather than building a ‘theoretically saturated’ life world.

The classification of the psychological trauma is based on ‘The International Classification of Mental and Behavioral Disorders (ICD-10) (McNally, 2003) and ‘The Diagnostic Statistics Manual of Mental Disorders (DSM-V); American Psychiatric Association (American Psychiatric Association, 2013). The Analysis and classification
followed the IPA procedural steps outlined by (Biggerstaff & Thompson, 2008). The process involved: 1) each interview transcript analyzed individually, case by case. Each was read at least twice and initial notes were made. These notes aimed to paraphrase; summarize; indicate interesting and significant aspects of the text; note any association or connections that came to mind; and identifying the contradictions, similarities and differences found in the transcript. 2) Step two entailed noting inferences concerning the nature, meaning and context of the participant’s experiences. Critical questions of the data, such as “what is the participant trying to say here? Do I sense something going on here that maybe the participants themselves are less aware?” (Chalya et al., 2012). At this step, the analysis was more interpretative. The emerging theme titles reflected a slightly higher level of abstraction which evoked more psychological terminology. 3), the third stage involved seeking connections between themes. The iterative process of moving between the transcript and the list of themes facilitated clustering and merging themes in accordance to their shared meanings. 4), the above analytic process was applied to all transcripts. Themes identified in the first interview helped to orientate the analysis. Noticing any replication of themes whilst remaining open to new emerging themes, the analysis was respectful of convergences and divergences in the data. 5) the final process involved interpreting and synthesizing the organized data into general and specific understandings and conclusions (Ulin, 2002). After all the interviews had been analyzed, the first write-up draft was generated. Academic supervision helped to refine the consolidated list of barriers and psychological trauma by considering alternative professional classification methods. This process helped to produce a final list of barriers and psychological trauma as a whole, thus enabling deeper understanding and an
effective presentation of the perspectives and lived experiences of the road accidents survivors. Results are presented and explained using descriptive statistics and Interpretative Phenomenological Analysis framework.

3.11 Logistical and Ethical Considerations

Kenyatta University Graduate School and Ethics Committee and Kisii Level Five Hospital Research and Training Committee reviewed and approved the study as shown in appendix 1 and 2. Training on research ethics, interviewing techniques for research assistants was done. Participants were assured of confidentiality and termination of interviews at any time. Before any interview would start, issues were clarified to participants and oral informed consent given. The interview tool was signed by the interviewer; appendix 3.
CHAPTER FOUR: RESULTS

This section presents the results as per objectives of the study. A total of 191 RTI survivors were enlisted for this study with a focus on identifying their demographic characteristics, psychological trauma and barriers to RTI trauma care. The response rate was 160.5% as the researcher reached 72 more above the expected 119 respondents.

4.1 Socio-demographic Characteristics of RTI Survivors

Table 4.1. Demographic characteristics of RTI survivors; disaggregated by type

<table>
<thead>
<tr>
<th>Socio-demographics</th>
<th>Categories</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Less than 20</td>
<td>4</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>21-29 years</td>
<td>39</td>
<td>20.4</td>
</tr>
<tr>
<td></td>
<td>30-39</td>
<td>67</td>
<td>35.1</td>
</tr>
<tr>
<td></td>
<td>40-49</td>
<td>52</td>
<td>27.2</td>
</tr>
<tr>
<td></td>
<td>50-59 years</td>
<td>27</td>
<td>14.1</td>
</tr>
<tr>
<td></td>
<td>&gt;60</td>
<td>3</td>
<td>1.2</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>128</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>63</td>
<td>33</td>
</tr>
<tr>
<td>Type of patient</td>
<td>Out-patient</td>
<td>108</td>
<td>56.5</td>
</tr>
<tr>
<td></td>
<td>In-patient</td>
<td>83</td>
<td>43.5</td>
</tr>
<tr>
<td>Residence</td>
<td>Urban</td>
<td>78</td>
<td>40.8</td>
</tr>
<tr>
<td></td>
<td>Rural</td>
<td>113</td>
<td>59.2</td>
</tr>
<tr>
<td>Marital status</td>
<td>Married</td>
<td>132</td>
<td>69.1</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>59</td>
<td>30.9</td>
</tr>
<tr>
<td>Education Levels</td>
<td>Primary</td>
<td>21</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>135</td>
<td>70.7</td>
</tr>
<tr>
<td></td>
<td>Tertiary</td>
<td>35</td>
<td>18.3</td>
</tr>
<tr>
<td>Occupation</td>
<td>Salaried worker</td>
<td>34</td>
<td>17.8</td>
</tr>
<tr>
<td></td>
<td>Casual/volunteer</td>
<td>33</td>
<td>17.3</td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td>26</td>
<td>13.6</td>
</tr>
<tr>
<td></td>
<td>Self employed</td>
<td>98</td>
<td>51.3</td>
</tr>
<tr>
<td>Monthly Income (Ksh.)</td>
<td>5000-10000 ($50-100)</td>
<td>105</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>10001-15000 ($100-150)</td>
<td>63</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>&gt;15001(150)</td>
<td>23</td>
<td>12</td>
</tr>
</tbody>
</table>

Data are presented as number (N) and frequency (%) of respondents. Age categorization is based on Ongecha-Owuor, Kathuku, Othieno, & Ndetei (2004), but with modifications.
There were more male than female RTI survivors. Majority of these male survivors were aged 21-49 years old, a population that was economically productive. This included 67% male and 33% female respectively, with 43% as in-patient and 57% as outpatient. 69.1% were married. 59.2% lived in rural areas with 40.8% in urban areas. 89% had at least secondary level of education while 11% had primary level. Cumulatively, 68.6% were in informal employment while 31.4% were in formal employment. Based on minimum wage guidelines (Kenya Gazette Supplement No.9; 2015), a significant number, 55% earned approximately, Ksh.5000-10000 ($50-100). 9.4% earned above Ksh 10,000/month, ($100). Approximate exchange rate; $1 = Ksh. 100.

4.2 Psychological Trauma due to Road Traffic Injuries

Table 4.2. Psychological trauma among the RTI survivors by category

<table>
<thead>
<tr>
<th>Psychological traumas</th>
<th>Categories</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flashbacks and horrific memories</td>
<td>Yes</td>
<td>180</td>
<td>94.2</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>11</td>
<td>5.8</td>
</tr>
<tr>
<td>Phobic travel anxiety</td>
<td>Yes</td>
<td>173</td>
<td>90.5</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>17</td>
<td>9.5</td>
</tr>
<tr>
<td>Insomnia and Nightmares</td>
<td>Yes</td>
<td>166</td>
<td>86.9</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>25</td>
<td>13.1</td>
</tr>
<tr>
<td>Avoidance behavior</td>
<td>Yes</td>
<td>164</td>
<td>85.8</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>27</td>
<td>14.2</td>
</tr>
</tbody>
</table>

Data are presented as number (N) and frequency (%) of respondents.
Psychological traumas classification is based on "The Diagnostic Statistics Manual of Mental Disorders (DSM-V); American Psychiatric Association, (American Psychiatric Association, 2013).

The current study presents, in table 4.2, the major identified RTI related psychological traumas. These are based on the survivors' "subjective" perceived quality of life after road accidents. They include; flashbacks and horrific memories, phobic travel anxiety, insomnia and nightmares and avoidance behavior.

4.2.1 Flashbacks and replaying horrific memories

180 (94.2%) of the RTI survivors as presented in Figure 4.1. experienced recurring dreams with intrusive flash backs and horrific memories. This was characterized by persistent remembering or "reliving" the stressor by intrusive flash backs, vivid memories and recurring dreams. They reported to experience distress even when they were not asleep, especially when they got exposed to circumstances resembling or associated with the stressor.

![Figure 4.1. Flashbacks and horrific memories](image-url)
4.2.2 Phobic travel anxiety and panicky experiences

173 (90.5%) of RTI survivors as shown in Figure 4.2, experienced persistent phobic travel anxiety and panicky experiences. This occurred mostly during scheduled revisit to health facilities for follow-up care or traveling for unavoidable reason.

![Pie chart showing 90.5% Yes and 9.5% No for survivors experiencing panicky and phobic travel anxiety.]

Figure 4.2 Proportion of survivors experiencing panicky and phobic travel anxiety

The two personal testimonies below further amplify the above experiences that RTI survivors were likely to face as aftermath of accidents.

**Personal testimony 7** “*...When am driving or being driven, I visualize and imagine accidents. Whenever another car nears mine or the one am travelling in, my brain keep playing through what could have been had the worst happened. I have a hard time relaxing when someone else is driving. I find myself engaging imaginary brakes as if I was driving...*” Outpatient former driver
Personal testimony 8 “…I become anxious and panicky whenever I hear a strange ‘bang’ like sound around me. The sound reminds me of the collision and screaming for help that was the day we got in this accident. I some time lose energy; close my eyes not to see what will befall me. Severally, I have found myself in that state when it is raining with thunderstorms. It worries me that I might not be able forget the day” Out-patient participants

4.2.3 Insomnia

166 (86.9%) of RTI survivors presented in figure 4.3; experienced repeated episodes of sleepless nights due to previous road accident experience. These experiences manifested in form of complaints of difficulty falling asleep, maintaining sleep, or non-refreshing sleep.

Figure 4.3 Proportion of survivors presenting with sleep disturbance
The two personal testimonies 14 and 1 attest to these experiences of sleep related disorders that many more RTI survivors were likely to endure in the process to their recovery from psychological effects of road accidents.

**Personal testimony 14** “...I was so filled with adrenaline I could not sleep for months and I had to take sleeping tablets when I did. It's been over 2 years since then and I still feel like my mental processes have changed because of that accident. I just keep visualizing it over and over.” Out patient

**Personal testimony 1** “...I kept replaying it over and over again in my head, how I might have done something differently, if only I had turned on music to keep me awake, or if only I had avoided the trip.” Out patient

**4.2.4 Avoidance behavior**

164 (85.8%) as shown in figure 4.4, exhibited avoidance behavior. These experiences manifested as fear and refusal to board vehicles. The survivors engaged their ‘assistants’ in efforts to avoid driving in vehicles and wished they had alternative means of transport back to hospital during scheduled care services.
Figure 4.4. Proportion of patients expressing fear and refusal to board vehicles

An out-patient survivor's testimony narrated below illuminates more light on the fear and refusal experiences that RTA survivors were likely to manifest with.

Personal testimony 5  "When am scheduled for a revisit for my therapies, I find it difficult to board a vehicle. It reminds me of the screaming passengers, strong brakes and smoke fumes I witnessed on that fateful day. I thank God for saving me." Out-patient respondent

4.2.5 Overwhelming emotions and memory lapses

Thematically, the interpretative approach to qualitative analysis with reliance on scientifically recognized mental distress after major life threatening events, found that RTI survivors presented with overwhelming emotions during narration of their experiences. Through observations, almost all survivors exhibited some level of emotions
with some ‘breaking down’ into tears. The testimony below is reflective of psychological experiences that survivors were likely to exhibit after a life threatening incident.

**Personal testimony 3** “...when am having discussions with friends or my care givers, I sometime go blank and stop talking. I lose the flow of my speech, sometimes it is incoherent. You know we all have emotions and any rekindled memories of any painful experiences...like mine...in the accident where I lost my mum whom I was taking to hospital, I tell you it is painful. Very painful! I don’t even want to continue with this discussion...when I remember my mum...sorb...!” Out-patient survivor.

These survivors also had difficulties in concentrating and keeping their attention on the interviews. They appeared to lose memory and unable to recollect some facts about the accident. At other times participants showed symptoms that suggest a lack of self-awareness or personal identity and/or inability of rational and logical explanations.

**4.2.6 Feelings of guilt and self-blame**

More experiences included feelings of remorsefulness and ‘guilty’ that were captured in the personal testimonies as identified in these verbatim narrations. **Personal testimony 1** “...I kept replaying it over and over again in my head, how I might have done something differently, if only I had turned on music to keep me awake, or if only I had avoided the trip” Out patient **Personal testimony 10** “Whenever, flashbacks from that accident come back, I find myself thinking of why I did not calculate well. My helplessness is as a result of my own mistakes. The way I see how accident survivors in this same ward struggle, I don’t want to say I was a driver...because I think; they will hate me for bad driving. If I get chance to talk to drivers, it’s just one message.
"Remember you are in a metallic ‘coffin’ before you die. Handle that ‘coffin’ carefully before it handles you.” A public service vehicle driver

**Personal testimony 12** "...I now see how a second of miscalculation becomes a terrible mistake. I was driving rushing to catch up on an important appointment. The car ahead of me was slow so I decided to overtake it. The on-coming one was in my calculation, in a good distance I could manage to get off to my lane in good time. I was wrong. In an almost head on collision, I swapped and landed into a deep ditch. The rest, I did not see I just found myself in hospital. All my life I had been careful in what I do and decisions I make. Today, I keep asking myself, how could it be that I made that wrong calculation? Was it God’s plan to show me things I never saw in life? I have heard about accidents on TV, radio and newspapers- those were like passing words. Now it is real to me. How life changes? The Wednesday-ladies night out, picnics and parties I used to enjoy with friends, all those are distant memories now because of my miscalculation”. In-patient survivor

Feelings such as those exhibited in the testimonies above are more likely to be experienced by survivors who were in control of the vehicle in which they sustained the injuries. They are likely to be characterized by apologetic tones and with some sense of guilt to causing accidents.

**4.2.7 Nightmares**

The findings show that road accident survivors were more likely to experience unpleasant dreams about the accident while asleep. The verbatim narration below illuminates how survivors cannot enjoy their sleep following previous accident.
Personal testimony 13 “...I jump from my sleep screaming with a fast heart beat because I get frightened with bad dreams of an accident. When I become awake, I find it hard to catch sleep for some time fearing an accident. My young brother thinks am visited by demons in my sleep. I don’t know what to do because I can’t control bad accident dreams”. Out-patient survivor.

Testimonies such as the one above exhibiting characteristics of awakening from nocturnal sleep or naps indicate what RTI survivors were likely to endure while coping with the aftermath of a road accident.

Table 4.3. Duration between occurrence of accident and study period

<table>
<thead>
<tr>
<th>Length from time of accident and study period</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survivors interviewed within one month after accident</td>
<td>122</td>
<td>63.9</td>
</tr>
<tr>
<td>Survivors interviewed between one and three month after accident</td>
<td>36</td>
<td>18.8</td>
</tr>
<tr>
<td>Survivors interviewed between three months and six months</td>
<td>16</td>
<td>8.4</td>
</tr>
<tr>
<td>Survivors interviewed between six months and two year</td>
<td>17</td>
<td>8.9</td>
</tr>
<tr>
<td>Total</td>
<td>191</td>
<td>100</td>
</tr>
</tbody>
</table>

Data are presented as number (N) and frequency (%) of respondents.

Table 4.3 summarizes the duration between occurrence of accident and study period to illuminate how psychological trauma after road accident can lurk, long after physical injuries recovered. 33 (17.3 %) of survivors were interviewed between three and two years after road accident but still exhibited psychological trauma. This is a significant
proportion of survivors still experiencing mental trauma, sometimes alongside physical pain. However, how long such psychological trauma would lurk is unknown.

4.3 Barriers to Road Traffic Injury Trauma Care

In this study, barrier factors influencing road accident trauma care are considered as proximal factors. Overall, all survivors experienced at least one type of barrier to trauma care following road accident. A majority, 153 (80.1%) survivors as presented in table 4.4 received pre-hospital trauma care from non-professional lay persons compared to those that received it from professionals. Cumulatively, in the same table, 89% of survivors were transported to hospital in other means other than ambulances. Only 11% were transported in ambulances.

Table 4.4. Barriers to road traffic injury trauma care by category

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Categories</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-hospital care</td>
<td>Served by lay persons</td>
<td>153</td>
<td>80.1</td>
</tr>
<tr>
<td></td>
<td>Served by Medic</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Served by Police</td>
<td>14</td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>23</td>
<td>12.0</td>
</tr>
<tr>
<td>Transport to hospital</td>
<td>Ambulance</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Public transport</td>
<td>99</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Private vehicles</td>
<td>49</td>
<td>13</td>
</tr>
<tr>
<td>Financial difficulty</td>
<td>Sold investment</td>
<td>134</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Borrowed</td>
<td>106</td>
<td>56</td>
</tr>
</tbody>
</table>

Data are presented as number (N) and frequency (%) of respondents.
Based on the survivors' perspectives and experiences encountered during these accidents, barriers to trauma care were categorized into different forms which include:

4.3.1 **Involve of unqualified lay persons in rescue and basic trauma care**

All the 191 (100%) survivors reported that qualified rescue missions arrived late at scenes of accidents and therefore experienced poor rescue procedure from the wreckages, while others were never touched due to many cultural myths about handling dead bodies or blood of injured persons. The lay-people's cultural background, limitations in knowledge and late arrival of the emergency services might have led to RTI survivors developing secondary injuries.

4.3.2 **Mode of Transport**

A combined majority, 89% of survivors as presented in figure 4.4 were transported to hospital by either public transport or motor cycle and private cars while only 11% were transported in ambulance. Survivors witnessing police arrival at the scenes of accident reported that the first thing the police did was to take measurements of the accident scene and take statements to make a report. Where there were fatal outcomes and serious injuries on the scene the police would make a more detailed report which took time. Personal testimony nine shows the events between arrival of police and evacuation of survivors to hospital.

**Personal testimony 9** “...*when the police arrived they started with securing the accident scene, taking measurements and interviewing witnesses for accident details...this left us at the mercy of other well-wishers to rescue and take us to hospital.*”

Out-patient survivor
Figure 4.5. **Mode of transport to hospital after a road accident by type**

4.3.3 **Survivors and type of pre-hospital trauma care provider at scene of accident**

Overall, 99.5% of survivors presented in table 4.5, received pre-hospital trauma care from non-professionals. A majority, 80.1% were attended to by unskilled bystanders, usually the first ones to arrive at crash scenes. Only 0.5% of the survivors were served by a professional medical trauma care provider.
Table 4.5. Survivors and type of pre-hospital trauma care provider at scene of accident

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survivors served by lay bystanders at accident scene</td>
<td>153</td>
<td>80.1</td>
</tr>
<tr>
<td>Survivors served by police</td>
<td>14</td>
<td>7.3</td>
</tr>
<tr>
<td>Survivors served by a relative</td>
<td>21</td>
<td>10.9</td>
</tr>
<tr>
<td>Survivors served by someone involved in the accident</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Survivors served by a medic</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Survivors who did not know who served them</td>
<td>1</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Data are presented as number (N) and frequency (%) of respondents.

4.3.4 Financial barriers to trauma care

70% of survivors presented in figure 4.6, sold their investments while 56 % as shown in figure 4.7, borrowed to pay for trauma care and associated bills. Road accidents happen unexpectedly, the time taken between sourcing either through selling or borrowing and actual access to cash takes time. This delay is likely to prolong the time between injury and trauma care seeking and therefore a big barrier to trauma RTI care.
Figure 4.6. Proportion of survivors who sold items to pay for RTI trauma care

Figure 4.7. Proportion of survivors who borrowed to pay for medical care due to injury
4.3.5 Delayed services, expensive drugs and inadequate medical providers

Majority of the survivors as presented in figure 4.8, 44% of survivors experienced delayed general trauma care services right from the scene of accident to hospital level. 13% of survivors perceived National Hospital Insurance Fund (NHIF) services to be unnecessarily delayed hence delaying provision of care. Another 11% of survivors had difficulties paying for expensive drugs while 10% had to wait for specialized trauma care provider to arrive.

Figure 4.8. Delayed services, expensive drugs and inadequate medical providers
4.3.6 Scene of accident crowd behaviour

Various survivors had different personal tales of what traumatized them right from the scene of accident to various levels of trauma care. As shown in testimony 2, survivors helplessly watched their belongings stolen by some of the crowd members.

Personal testimony 2: “I saw how human beings can turn into unreasonable beings during accidents. They hear you shout for help but give you a deaf ear and scramble for the goods. Within a few minutes the whole canter full of sodas was empty. By the time the police arrived, nothing was left except broken bottles and crates. The rest was nowhere to be seen. Others took my wallet and some cash I had after they pulled me out of the vehicle. Just imagine human beings. However, not all are bad. Some can carry you to a safe place and wave down motorists to assist take you to hospital” Former driver outpatient respondent

4.3.7 Emotional state of care providers as a barrier to trauma care

Survivors reported feelings of “mismanagement” by care providers which could be partly attributed to providers’ emotional state. As demonstrated in testimony 11, survivors are likely not to be managed as fast as they could wish.

Personal testimony 11: “It’s not my wish to be in this condition. I need mercy rather than condemnation. Some nurses never smile at me and are always moody even when they are treating me. With a mask in her mouth and gloves on... you hear her hold her breath...sometimes leaves for a while and comes back with nothing. It leaves me wondering what she saw or left behind that made her leave”. In-patient survivor
Survivors expressed their concerns over attitudes by some care providers. They recorded feelings of mismanagement from their care providers.

4.3.8 Provider-patient communication

Providers–patient communication can enhance or hinder patient recovery. Testimonies 4 and 12 demonstrate two sides of patient-provider communication and their effects on the patients. In testimony 4; such type of communication, can inform whether patients go back or not for medical appointments. Communication such as the one reported in testimony 12 could significantly influence access to care.

Personal testimony 4: “...My tears flow when a nurse shouts at me because of wetting my sheets. I was feeling too much pain one evening when nurses went round with drugs. It was taking long for me to turn and take my medicine. I think the nurse became impatient and shouted...kama hutaki dawa sema niondoke (Just tell me to leave if you are not interested in your medication). I thought it was a joke...she left, though she later came back”. In-patient survivor

However, not at all times there is communication breakdown between a provider and a patient.

Personal testimony 12: “How are you feeling today question is a common question during ward rounds... but you may not know what difference it makes in the life of a sick person? Though am sick, my replies are always; I am fine!...It makes me feel someone cares about my feelings and health...doctors and nurses come, call me by name ... My being alive is because of these nurses. They've done so much, very professionally. I could
not do anything on my own... The morning greetings even without medication shows me... that I will recover faster” In-patient respondent.

4.3.9 Place and time of accident

Remote areas with few vehicles on the route, coupled with late hours as demonstrated in testimony 6; pose great barriers to accessing prompt RTA rescue and clinical trauma care.

Personal Testimony 6: “On my way from Kisumu, at a place called Misambi, I don’t know what happened ... at around 8.30 pm I had an accident but with slight injury though my car was totally damaged. This place is far from a big hospital like Kisumu and is isolated. Not much traffic after 8 pm. It took me about 3 hours before a breakdown arrived to rescue. A friend who picked me suggested since I was not seriously injured, I go sleep without going to hospital. In the morning we went to police to record a statement”. Special RTA survivor with in-patient

4.4 Relationship between socio-demographic characteristics and Psychological Trauma

The current study sort to know if there was any significant relationship between socio-demographics characteristics and psychological traumas. Chi-square test revealed that avoidance behavior and travel anxiety psychological effects were more significant in out-patient than in-patients; ($\chi^2 = 3.8$, df =1, $p = 0.001$). It also shows that RTI psychological trauma was significant in survivors with secondary and above level of education compared with those with primary level; ($\chi^2 = 4.1$, df =1 and $p = 0.001$). Therefore, type of patient and level of education significantly influenced the type of psychological traumas RTI survivors were likely to exhibit or present with.
Table 4.6. Relationship between socio-demographics and psychological traumas

<table>
<thead>
<tr>
<th>Variables</th>
<th>Travel anxiety</th>
<th>Insomnia/nightmares</th>
<th>Avoidance behavior</th>
<th>Flashback and horrific memories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>128</td>
<td>119 (93)</td>
<td>124 (96.9)</td>
<td>108 (84.4)</td>
</tr>
<tr>
<td>F</td>
<td>63</td>
<td>46 (73)</td>
<td>45 (71.4)</td>
<td>58 (92.1)</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>132</td>
<td>99 (75)</td>
<td>112 (84.8)</td>
<td>108 (81.8)</td>
</tr>
<tr>
<td>Single</td>
<td>59</td>
<td>47 (79.7)</td>
<td>52 (88.1)</td>
<td>45 (76.3)</td>
</tr>
<tr>
<td>Type of survivor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out-patient</td>
<td>108</td>
<td>101(93.5)</td>
<td>99 (91.7)</td>
<td>103 (95.4)</td>
</tr>
<tr>
<td>In-patient</td>
<td>83</td>
<td>22 (26.5)</td>
<td>74 (89.2)</td>
<td>12 (14.5)</td>
</tr>
<tr>
<td>Educ. Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pri.</td>
<td>21</td>
<td>3 (14.3)</td>
<td>6 (28.6)</td>
<td>5 (23.8)</td>
</tr>
<tr>
<td>Sec.</td>
<td>135</td>
<td>122 (90.4)</td>
<td>128 (94.8)</td>
<td>107 (79.3)</td>
</tr>
<tr>
<td>Tertiary</td>
<td>35</td>
<td>31 (88.6)</td>
<td>29 (82.9)</td>
<td>31 (88.6)</td>
</tr>
</tbody>
</table>

Sociodemographic characteristics of road traffic accidents survivors in Kisii Level Five Hospitals compared against psychological traumas using Pearson’s linear chi square at 95\% confidence interval (CI). Data are presented as number; \( \chi^2 (1) = 3.8, p = 0.001 \); and \( \chi^2 (2) = 4.1; p = 0.001 \).
CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

This section provides a detailed discussion of major findings, their interpretations and comparison with previous studies in the same area. It also provides implications of the key findings on the social demographic characteristics, psychological traumas as aftermath of road accident and barrier factors that influence trauma care. In general, the findings add to existing literature on the burden of RTIs in Kenya.

5.1.1 Socio-demographic characteristics

Kisii County had a variety of different people with numerous personal life experiences with road traffic injuries (RTIs). Married male survivors at prime age, a population that was economically productive, suffered the blunt of road accidents. Married men as majority RTI survivors means that their involvement in road accidents caused more than psychological trauma to their dependents. Again, men as majority in the present study is consistent with findings reported in previous studies, which showed that economically productive persons at prime and mid-life ages of 15-45 years were the major RTI casualties (Bachani et al., 2012; Chalya et al., 2012). However, in terms of age categorization, the age bracket of 21-49 as main casualties, slightly differ with those recorded by (Zhengguo Wang 2003) who documented that the major causalities of RTIs were person aged 35-64 years. The differences in the findings could be explained based on regional differences in which the studies were carried out as well as population cohorts targeted for the study.

Men in the economically active age as road injury survivors portray an economic loss both to the family and the nation. This finding resonates with (Odero et al., 2003),
who found that road traffic injuries were estimated to cost Kenyans as much as US$ 3.8 billion annually, corresponding to 5% of the annual gross national product (GNP). The reasons for men’s high incidence of road traffic crash reflects their high activity levels and participation in high-risk activities such as driving or riding, over-speeding especially motor cycles, driving or riding under the influence of alcohol and driving/riding without wearing any protective gears. Male predominance in this study could also be due to their increased participation in activities like casual laborers in the construction industry, soft stone carvings and quarry activities that attracted more men than women in Kisii County, and therefore exposes them to road accidents. Pedestrians, students, salaried and business persons in this study that were involved in accidents were probably because of the rush through traffic to get to their businesses, places of work and to schools. Business persons were mostly involved during buying and selling their wares in the biggest market- Daraja Mbili or while travelling with goods purchased from one market to another- like Suneka to Oyugis. In order to maximize profits, these business persons usually opt for the cheapest means of transport available such as motorcycles.

The 191 survivors recorded in this study in slightly under one month of study could be higher than it is, given that some casualties end up either in private facilities or do not seek post-accident trauma care at all. Even so, 191 survivors in less than a month is a significant number with a heavy disease burden on the County’s only referral hospital, given that the hospital also manages other cases of sickness. This supports other findings by (Davis et al., 2004; Borse & Hyder, 2009; Bachani et al., 2012), which affirms that RTIs were the leading cause of disease burden and disability adjusted life years (DALYs) lost annually. To sum up, the fact that the economically productive age-group were
mostly involved demands an urgent Kisii County Level accident public policy and emergency response unit.

5.1.2 Psychological trauma due to road accidents

In agreement with other studies elsewhere this study shows 91% of RTI survivors experiencing psychological trauma, is apparent that there are short and long-term psychological trauma of different types as aftermath of traumatic event such as road accidents (Khorasani-Zavareh et al., 2009; Toroyan & Peden, 2009). The study recorded a spectrum of different psychological reactions which people experienced and exhibited various mental processes as manifested in the following excerpt. “...I become anxious and panicky whenever I hear a strange ‘bang’ like sound around me. The sound reminds me of the collision and screaming for help...” Such reactions are common in situations that remind survivors of the frightening and life threatening events. Survivors, in most cases feel helpless and become ‘dead’ standstill. This verbatim extract portrays a picture of confusion with everything left to fate. “...I some time lose energy; close my eyes not to see what will befall me...severally, I have found myself in that state when it is raining with thunderstorms. It worries me that I might not be able to forget the day”. This extract explains the anxiety RTI survivors were likely to experience by being in places or situations from which escape might be difficult or which help may not be available in an unexpected situation leading to panicky situations.

Thematic analysis showed that immediately after a road crash, lives changed. The verbatim narration here is reflective of what survivors go through. “...When am scheduled for a revisit for my therapies, I find it difficult to board a vehicle. It reminds me of the screaming passengers, strong brakes and smoke fumes...on that fateful day...”
This extract represents intrusion, fear and avoidance symptoms similar to many other cases that survivors were likely to present with after road accidents. Travel anxiety and driving problems make survivors lose enjoyment when driving or as passengers. This can be a disabling experience that makes survivors develop involuntary oppositional defiant disorder. This can be actual or preferred avoidance of circumstances resembling or associated with the stressor.

Overall, besides physiological changes, survivors' lives changed due to a range of mental instabilities that caused mood swings. The same trend of psychological effects was demonstrated in another study (Mogaka et al., 2011), done in Thika Hospital. It showed that majority, 81% of RTI survivors, suffered not only non-fatal physical injuries but also psychological problems. Similar results are reflected in (Toroyan & Peden, 2009; Hyder et al., 2012), that RTI survivors and families lead long-term trauma which include flash backs from memories from crunching metal, screeching brakes, squealing tires, the smell of gasoline, shattering glass, screams, feelings of being out of control and fear of death. Sounds like screeching brakes and visual images haunt survivors for long after the crash and therefore affecting care and healing process. Studies conducted elsewhere (Janoff-Bulman, 1992; Beck & Coffey, 2007) agree with this study's findings that survivors of accidents have long-term post-traumatic responses that last for years, with profound changes in their personality. However, these findings slightly differ with the findings by (Harvey & Bryant, 2002; Neria, Nandi, & Galea, 2008) who discovered in their study that some RTI survivors seem to endure the most horrendous experiences psychologically unscathed, and appear to cope well. Nevertheless, both of these studies agree that survivors may experience late onset or delayed post-traumatic stress disorder.
(PTSD). These differences in psychological reactions after RTAs could be due to geographical differentiation, study population, their levels of engagements in their careers as well as the health care system preparedness to deal with the aftermath of RTAs. This quote of personal testimony; "...When am driving or being driven, I visualize and imagine accidents. Whenever another car nears mine or the one am travelling in, my brain keep playing through what could have been had the worst happened..." demonstrates the 'silent' psychological traumas common with RTI survivors.

Personal testimonies as seen in many of them above represent intrusion, fear and avoidance symptoms similar to many other cases that survivors present with following road accidents. Travel behavior and driving problems makes a survivor loss enjoyment when driving or being a passenger. This can be a disabling experience that makes survivors develop avoidance and oppositional defiant disorder.

To sum it all, this revelation of psychological traumas following road accidents has not been challenged by any study in Kenya. However, it has been substantiated and recognized by many authors both in and out of Kenya as an important public health concern. Therefore, this study gives insights from survivors' perspectives and lays bare the importance of such experiences for public health related psychological investigation, knowledge and thus, a logical argument for a comprehensive and holistic RTI trauma care.
5.1.3 Barriers to road accident trauma care

Overall, the present study determined that RTI survivors from Kisii encountered various pre-hospital and at hospital barriers to trauma care among them; involvement of non-professionals in rescue, transportation and trauma care. This finding is supported by (Khorasani-Zavareh et al., 2009), who argues that RTI survivors develop secondary injuries due to poor rescue services, often by lay persons, usually the first ones to arrive at the scene of accident. In this study, 89% of survivors were transported to hospital by relatives, Good Samaritan and police who are not trained on how to take care of these patients when an accident occurs (Akama et al., 2007), who observed that only a few cases of RTI are brought to hospital by ambulances. Whereas this study recorded 11% of cases brought in by ambulances, it contradicts observations by (Odero, Garner, & Zwi, 1997; Chalya et al., 2012), that only 0.8% of cases were brought to hospital in ambulances. This difference could be expected due to geographical variances and emergency services preparedness of given regions. An increase in the number of RTI survivors transported in ambulances to hospital as is the case in this present study, could be linked to a devolved county system with each building their emergency response units with more ambulances at their disposal. According to The National Road Safety Authority report 2014, the magnitude of road accidents has generally remained almost constant. Pre-hospital trauma epidemic is unnecessarily increased by the inefficiency of the trauma care services and inadequate response to accidents. Globally, pre-hospital care of RTI survivors is reported to be the most important factor in determining the ultimate outcome after the injury which according to the current study, is inadequate. Though, efforts by the Kenyan Government has seen an improved but with variable quality of pre-
hospital care by availing ambulances in every county, it still needs more. Sometimes it is
over zealous and frequently it is inadequately linked to a number of factors, like inability
to pay for RTI care.

In this study’s perspective, post-road accident trauma care is a strategy which aims to reduce the severity of injury consequences once a road traffic crash has occurred (Khorasani-Zavareh et al., 2009). Injury patients will often need the help of a general practitioner and optimal medical and psychological follow up care to alleviate pain and distress. The current study identified that this help was not prompt. Similar results were documented in another study elsewhere (Nhac-Vu et al., 2014). The study observed that RTI trauma care was not readily available leading to survivors suffering prolonged physical and psychological trauma. Similarly, this study’s findings are consistent with (Khorasani-Zavareh et al., 2009) who documented a number of existing barriers to RTI trauma care among them; involvement of lay persons in rescue mission. Whereas this study and that of Khorasani identify involvement of lay persons in rescue missions as a barrier to RTI care, (MacKenzie et al., 2006), argues that lay persons and survivors themselves have a great role to play in this care and rescue mission, as it requires a chain of help starting with action taken by the victimis themselves or more commonly by lay bystanders at the scene of the crash, emergency rescue, and access to the pre-hospital medical care system, and trauma care and helping survivors who have suffered debilitating injury re-integrate into work and family life. However, the effectiveness of such a chain depends upon the strength of each of its links (MacKenzie et al., 2006).

Among the greatest barrier of trauma care was financial constraint. Majority of survivors had inadequate income from their gainful economic engagements. The level of
resources reflects on one’s economic status and is a determinant of affordability of health care services especially RTI related trauma care (Odero et al., 2003; Mikuczewska-Wośko, Bilyj, & Tomczyk, 2009). With majority of survivors in Kisii earning between Ksh. 5,000-10,000 ($ 50-100), a month, it can be extremely hard for households to afford RTI related trauma care when a member was involved in an accident. This finding agrees with (Jacobs & Aeron-Thomas, 2000), in an economic burden review of RTAs found that the annual cost of road crashes was in excess of US $500 billion globally. In Sub-Saharan Africa, the estimated costs as a percentage of the Gross National Product (GNP) ranged from 0.8% in Ethiopia, 1% in South Africa, 2.3% in Zambia, 2.7% in Botswana and almost 5% in Kenya, which translates to over US$ 3.8 billion annually (Odero et al., 2003) With this, survivors’ income, based on the national gross product from earlier studies on the cost of RTI trauma care as a denominator, then RTI survivors on Kenyan roads, would find trauma care unaffordable.

The study also identified break down on provider-patient communication and low mental state of care providers which appeared to happen at facility level to influence the quality of services provided to RTI survivors. This extract “...My tears flow when a nurse shouts at me ...” This kind of communication goes hand in hand with provide attitude and state of mind (Franzén, Björnstig, & Jansson, 2006; Patak et al., 2009). This finding is supported by (Bartlett, Blais, Tamblyn, Clermont, & MacGibbon, 2008) who explain that absence of effective patient-provider communication is a significant factor contributing to adverse outcomes. With this finding, it would be deducted that RTI survivors at Kisii Level Five might not recover as fast as they should. It is upon the ministry of health to work on contributing factors that perpetuate ineffective patient-
provider communication, which include but not limited to monitoring of patient-provider communication needs and interventions; and a lack of standardized communication training of health care providers (Martínez-Ruiz et al., 2015). Studies indicate that effective interpersonal communication (IPC) between health care providers and clients is one of the most important elements for improving patients’ health seeking behavior. It is proven that patients, who believe the provider is concerned about their well-being, show compliance thus improved health outcomes. However, despite acknowledgement of the importance of interpersonal communication, the subject is not always emphasized in medical training, hence has become a great barrier to trauma care (Patak et al., 2009).

Overall, it is evident from this study that survivors’ perspectives provide some lime light indicating that there could be many gaps in RTI trauma care. Such evidence include, at the scene of crash crowd behavior that hampered rescue missions as is exemplified by a driver survivor’s story “...I saw how human beings can turn into unreasonable beings during accidents. They hear you shout for help but give you a deaf ear and scramble for the goods...” Crowd behavior makes it hard to tell whether there are efforts to save lives or just curiously looking. If pre-hospital care of RTI survivors is prompt and efficient many lives could easily be saved (Chalya et al., 2012)

5.1.4 Relationship between socio-demographics and psychological traumas

Overall, all the 191 RTI survivors recruited for the study, as presented in table 4.6, experienced at least one kind of psychological trauma as aftermath of road accidents. Chi-square tests revealed that avoidance behavior and travel anxiety were significantly associated with out-patient than in-patients; ($\chi^2 = 3.8, df =1, p = 0.001$). This difference could be attributed to out-patient RTI survivors having scheduled trauma care re-visits
which required them to travel, thus exposing them to circumstances resembling or associated with the stressor, compared to those confined in surgical wards- hence travel anxiety and travel avoidance tendencies. The same statistical analysis shows that RTI psychological trauma was significantly associated with RTI survivors with secondary and above level of education compared with those with primary level; \( \chi^2 = 4.1, \text{df}=1 \text{ and } p = 0.001. \) This difference could be due to varied life experiences, roles and responsibilities of the RTIS survivors and their respective career paths. Those with higher responsibilities and exposed to more wild view were more likely to suffer psychological trauma for long compared with those with limited exposure.

5.2 Conclusions

Majority of survivors in Kisii County who suffered the impact of RTAs, were married men at prime age of 21-49 years old, with at least secondary level of education and in gainful economic activities.

All RTI survivors presented with at least one kind of psychological trauma, with majority experiencing phobic travel anxiety and panicky experiences, insomnia, fear and refusal to board vehicles and feelings of guilt and self to blame.

All RTI survivors participating in the study received some kind of trauma care in attempting to ease the negative effects of RTIs. However, they did not receive the appropriate trauma care because of the existing barriers to RTI trauma care, which include involvement of lay persons in pre-hospital rescue and basic care, including transport to hospital by non-ambulances.
There was significant relationship between socio-demographic characteristics of survivors and the psychological trauma exhibited as aftermath of road accidents, especially in type of patient and level of education.

Overall, the study found the magnitude of RTI to be wider than known and this thus necessitates urgent measures.

5.3 Recommendations

5.3.1 Action recommendations

1. The Ministry of Health at national and county level should work with Red Cross, St. Johns Ambulance and African Air Rescue (AAR), together with Kisii Level 5 Hospital and the surrounding health facilities to sensitize the public on public health concerns about road accidents.

2. The National Road Safety Authority in partnership with Red Cross should develop a policy on driving situations for RTI survivors. Since RTA related psychological trauma like phobic travel anxiety and avoidance behavior can lurk under the surface for months long after physical injuries are healed, survivors need that driving situations are taught. Such lessons prepare them for driving experiences like slippery weather conditions, emergency braking; situations that rekindle memories causing discomfort.

3. The National Road Safety Authority and Red Cross and the County Public Health Department should partner with communities at the well-known major black-spots to recruit and train resident lay persons on RTA rescue skills, crowd management and evacuation to optimize trauma care to survivors while they provide responsive
emergency services like posting psycho-social counselors to health facilities if the psychological needs of RTI survivors are to be adequately addressed.

4. Due to significant relationship between social demographic characteristics and psychological trauma as well as level of education, counseling protocols should be sensitive to type of RTI survivor and their educational levels.

5.3.2 Areas for Further Research

1. The researcher suggests further retrospective studies to see the extent to which future research in the same field, but from other parts of the country, yielded similar or different socio-demographic characteristics result.

2. Further suggestions calls for a cross-sectional study on women specific psychological effects due RTIs. Since fewer women are represented in RTIs, they tend to be “blanketed” in the bigger context and their specific RTI traumas are overlooked. This is on the basis of this study’s design, which could not conclude that the findings provide a final list of the greatest barriers to trauma care and psychological disorders as aftermath of RTIs.

3. This study also suggests operations research on viability of basic trauma care and rescue procedure training for resident lay persons near well-known black spots. This is based on the findings, which shows involvement of untrained lay people in rescue. This will minimize emerging barriers to trauma care such as crowd behavior control and management at the scene of road accident. The study should focus on drivers and communities along known black-spots.
REFERENCES


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Available at: [http://www.globalpressinstitute.org/global](http://www.globalpressinstitute.org/global)


Osoro M. E. et al. (2011); Factors associated with severity of road traffic injuries, Thika, Kenya; The Pan African Medical Journal - ISSN 1937-8688.


**Websites**

http://aarhealth.com

http://www.kenyapolice.go.ke/blackposts.asp

http://softkenya.com

APPENDICES

Appendix 1: Kenyatta University research authorization permit
Final Ethics authorisation letter

KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE

Fax: 87114245/8711572
Email: kenethreview@kbu.ac.ke
Website: www.kbu.ac.ke

P. O. Box 43944
Nairobi, 00100
Tel: 771/601412

Date: April 25th, 2018

Samuel Otieno Ogare
School of Public Health
Kenya University
P. O. Box 43944, Nairobi

Dear Sir,

APPLICATION IN ACCORDANCE OF 2016: SATISFACTION WITH AND BARRIERS FOR IMPROVED POST-CRASH TRAUMA CARE AMONG ROAD ACCIDENT SURVIVORS IN Kilifi LEVEL 5 Hospital

GENERAL

The application before the committee is with a research topic "Satisfaction with and Barriers for Improved Post-Crash Trauma Care among Road Accident Survivors in Kilifi Level 5 Hospital" Version 2, dated 19th April 2018.

2. APPLICANT

Samuel Otieno Ogare
School of Public Health
Kenya University
P. O. Box 43944, Nairobi

3. SITE

Kilifi Level 5 Hospital

4. COUNCIL

The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (version 3.2.1.0) and the Kenyatta University ethics Review Committee (Guidelines) and is of the view that the following elements of review:

(a) Scientific design and conduct of study
(b) Recruitment of research participants
(c) Care and protection of research participants
(d) Protection of research participant's confidentiality
(e) Informed consent process
(f) Community involvement

AND APPROVED and that the research may proceed for a period of ONE YEAR starting 24th April 2018.
5. ADVISE/CONDITIONS

i. Progress reports are submitted to the Kenyatta University Ethics Review Committee (KU-ERC) every six months and a final report is submitted at the end of the study.

ii. Serious and unexpected adverse events related to the conduct of the study are reported to this board immediately they occur.

iii. Notify the KU-ERC of any amendments to the protocol.

iv. Submit an electronic copy of the revised proposal to KU-ERC.

When replying, kindly quote the application number above.

If you accept the decision reached and advice and conditions given please sign in the space provided below and return to KU-ERC a copy of the letter.

[Signature]

PROF. NICHOLAS K. OIKONYO
CHAIRMAN KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE

Samuel Okech.Ogara accept the advice given and will fulfill the conditions therein.

Signature

Dated this day 25th of April 2013.

cc. Vice-Chancellor
Director, Institute for Research Science and Technology
Appendix 2: Kisii Level 5 research authorization letter

REPUBLIC OF KENYA
MINISTRY OF HEALTH

Telephone: +254722288305
Fax:  
Email: dhokkisicentral@gmail.com
Ref: KCOHN/1342/3
Date: July 17, 2013

Samuel Ogare
Kenyatta University (Department of Community Health)
P.O Box 43844
NAIROBI

RE: STUDY APPROVAL

Study Title: Satisfaction with and Barriers for improved Post-crash Trauma Care among road accident survivors in Kisii Level 5 Hospital

Comments from ethics committee

- Overall the study topic is in a very relevant area and reflects the current public and Government concern of the high frequency of vehicular related accidents in Kisii and the Country at large. Kisii County is also known for high prevalence of trauma related to violence among the people.
- The Study, if well executed will generate new knowledge and contribute to better care and treatment of victims of these accidents at Kisii Level 5 Hospital and indeed other Hospitals in the Country.
- The Ethics Committee recommends the study to continue under following conditions:
  - The researcher to meet members of the research committee and the department of surgery team lead by the Hospital surgeon to assist him further.
That the topic appears to have 2 different study entities i.e. 'satisfaction' and 'barriers'. A clear study area should be identified to make the study area easily researchable.

The researcher to come up with a clear definition of certain terms as used in the study e.g. improved?, from where to where?

That the researcher to come up with clear sampling procedure(s) to be used i.e. whether you will use Cluster method or Stratification since vehicular related and non-vehicular related is more of Stratification than Cluster.

Thank you

Dr. Crispus Nyongesa MBChB(UON), MPH(Moi),dip(STI)-UON
Secretary-Ethics Committee
Appendix 3: Interview schedule

Consent form: Verbal consent script for in-patient and out-patient respondents

Hello, my name is…………………………and my colleague is ………………….We are collecting data on (state topic), for a master's degree from Kenyatta University Department of Community Health. This study will provide vital findings that can be used to improve road safety in Kenya and trauma care for accident survivors.

Participation in the study is free and if you agree to participate, please allow us to start by you saying; I accept or I decline.

Thank you.

We have a few quick questions we’d like to ask you about yourself on vehicles use and involvement in accident. We will not record your name or any personal identifier. Nothing will happen if you chose not to participate. If you do participate, you can stop answering questions at any time. You can say yes now, answer questions and change your mind later as well.

We are asking you to feel free and ask us any questions in relation to the study at any point of the discussion as you provide vital information that would help this study. You were chosen because you were affected directly by road safety.

If you have any doubts about the study or content, you are free to contact the university supervisors of this study; Dr. Akunga Daniel, at 0722-552157, or Dr. Tom Were at 0720326127.

Principal investigator Telephone: +254-0726256323.

________________________________________

Signature of Person obtaining consent Date____________________________________
Section 1: Respondent listing and demographic data: Hospital based study

<table>
<thead>
<tr>
<th>1.1</th>
<th>1.2</th>
<th>1.3</th>
<th>M</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-patient</td>
<td>Out-patient</td>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4 Age</td>
<td>1.5 Marital status</td>
<td>Married</td>
<td>Single</td>
<td></td>
</tr>
<tr>
<td>1.6 Date of Interview</td>
<td>1.7 Consent obtained</td>
<td>Yes</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>1.8 What is the highest level of education you got?</td>
<td>Uneducated</td>
<td>Primary</td>
<td>Sec</td>
<td>College</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1.9 What is your current occupation?</td>
<td>Casual</td>
<td>Self</td>
<td>Salaried</td>
<td>Unemployed</td>
</tr>
<tr>
<td></td>
<td>worker</td>
<td>employed</td>
<td>worker</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.10 What is your average monthly income?</td>
<td>Below 5000</td>
<td>5000-10000</td>
<td>Above 10001</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.11 Where do you live?</td>
<td>Rural area</td>
<td>Urban area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section 2: We are going to ask you detailed questions of the accident.

<table>
<thead>
<tr>
<th>2.0</th>
<th>2.1</th>
<th>2.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>When exactly did the injury happen to you?</td>
<td>Within one month</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Between one 2 months and three months</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between three months and six months</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between six 4 months and one year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skip</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Fall from a moving vehicle</td>
<td>0</td>
</tr>
<tr>
<td>2.2</td>
<td>At the scene of injury, did you receive medical care?</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Don't know</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.3</th>
<th>Who provided care for you?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative</td>
<td>1</td>
</tr>
<tr>
<td>Bystander</td>
<td>2</td>
</tr>
<tr>
<td>Police</td>
<td>3</td>
</tr>
<tr>
<td>Medic</td>
<td>4</td>
</tr>
<tr>
<td>Someone involved in the injury</td>
<td>5</td>
</tr>
<tr>
<td>Don't know</td>
<td>9</td>
</tr>
<tr>
<td>Other (specify)</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.4</th>
<th>Did you seek medical attention immediately after the injury?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.5</th>
<th>If yes, where did you go first for care?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
<td>1</td>
</tr>
<tr>
<td>Health clinic</td>
<td>2</td>
</tr>
<tr>
<td>Health center or health post</td>
<td>3</td>
</tr>
<tr>
<td>Neighboring compound/home near scene</td>
<td>4</td>
</tr>
<tr>
<td>Community health worker</td>
<td>5</td>
</tr>
<tr>
<td>2.6</td>
<td>How were you transported to the medical care facility/hospital?</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Traditional practitioner</td>
</tr>
<tr>
<td></td>
<td>Pharmacy/drug store</td>
</tr>
<tr>
<td></td>
<td>Don't know</td>
</tr>
<tr>
<td></td>
<td>Other (Specify)</td>
</tr>
<tr>
<td></td>
<td>Personal vehicle</td>
</tr>
<tr>
<td></td>
<td>Public transport</td>
</tr>
<tr>
<td></td>
<td>Driven by someone unknown</td>
</tr>
<tr>
<td></td>
<td>Ambulance</td>
</tr>
<tr>
<td></td>
<td>Motorcycle/Boda</td>
</tr>
<tr>
<td></td>
<td>Boda</td>
</tr>
<tr>
<td></td>
<td>Don't know</td>
</tr>
<tr>
<td></td>
<td>Other (Specify)</td>
</tr>
<tr>
<td></td>
<td>Yes - some difficulty</td>
</tr>
<tr>
<td></td>
<td>Yes - a lot of difficulty</td>
</tr>
<tr>
<td></td>
<td>Cannot do at all</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.7</th>
<th>As a result of the injury, was there decline in the usual household income (money coming in, not expenditures)?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes- 1</td>
</tr>
<tr>
<td></td>
<td>No- 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.8</th>
<th>As a result of the injury, did the usual household food consumption decline?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes- 1</td>
</tr>
<tr>
<td></td>
<td>No- 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.9</th>
<th>As a result of the injury, did your household have to borrow money to take care of you?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes- 1</td>
</tr>
<tr>
<td></td>
<td>No- 2</td>
</tr>
<tr>
<td>Question</td>
<td>Yes</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>2.10 As a result of the injury, did your household have to sell anything to pay for medical treatment or to make up for loss of income?</td>
<td></td>
</tr>
<tr>
<td>2.11 As a result of accident, do you suffer from any of these experiences and challenges?</td>
<td></td>
</tr>
<tr>
<td>1. Anxiety, stress, depression,</td>
<td></td>
</tr>
<tr>
<td>2. Change of diet</td>
<td></td>
</tr>
<tr>
<td>3. Difficult accessing hospital for follow-up care</td>
<td></td>
</tr>
<tr>
<td>4. Fear and refusal to board a vehicle</td>
<td></td>
</tr>
<tr>
<td>5. Nightmares related to accident</td>
<td></td>
</tr>
<tr>
<td>6. Any other not listed specify...</td>
<td></td>
</tr>
</tbody>
</table>

| 3.0 Traumatic experiences you go through                                  |      |     |
| 3.1 What are traumatic experience do you go through because of your accident? |      |     |
| 3.2 How have you managed to cope with the trauma after the accident?     |      |     |
| Self-assisted                                                           | 1    |     |
| A paid assistant (nurse or therapist)                                    | 2    |     |
| Family member                                                           | 3    |     |
| Others                                                                  | 4    |     |

ONLY FOR-Research Assistant comments on this participant (Any comments/observations) you think can explain more about the participant? E.g. memory failing to remember some facts, not willing to speak about some trauma issues etc. Thank the respondent and wish him or her quick recovery. Shake hands for those able to shake.
Appendix 4: Glossary of Traumatology_ short version

This glossary deals with psychological responses to ‘near death’ events and only relates indirectly to physical injuries. Developed by Soren Buus Jensen between 1996 and 2002 as a possible framework for organizing early emergency interventions

In this thesis, psychological constructs are based on DSM-V / DSM-IV-TR and Interpretative Phenomenological Analysis (IPA) and International Classification of Diseases for Behavioral and Mental Disorder, 10th Revision, 1992. (ICD-10 Mental Disorders). Lifton's Characteristics of a Survivor, have been used too, to provide further description of the psychological effects of RTAs: Robert Jay Lifton (1968) listed five psychological issues in survivors of major trauma - the death imprint, death guilt, psychic numbing, conflicts around nurturing & contagion, and struggles with the formulation of meaning.

- DSM-V / DSM-IV-TR: The American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorder, 5th Edition, published 2013. It specifies criteria for mental disorders, including PTSD and Acute Stress Disorder. DSM-V is reproduced in part at Behave Net. Conditions linked to extreme events are listed under Anxiety Disorders and Dissociative Disorders. TR refers to Text Revision. DSM-IV-TR was updated in 2000 but without changes directly related to traumatic conditions. It was reproduced as DSM-V in 2013 and listed in this dictionary’s References under APA. See also ICD-10. [Paul Burns]
- Interpretative Phenomenological Analysis (IPA) is a process of Formulation of Meaning: Robert Jay Lifton's (1968) term for a survivor's need to find meaning that makes sense of the trauma and the world she or he now inhabits. One of Lifton's Characteristics of Survivors. [Paul Burns]
- ICD-10: The World Health Organization International Classification of Diseases, 10th Revision, 1992. ICD-10 Mental Disorders summary. ICD-10 definition of PTSD. ICD-10 also includes Enduring Personality Change following extreme events. [Paul Burns]
- Abreaction: The release of emotional energy, thought to have a cleansing effect on the traumatic experience. Sigmund Freud adopted the term from the work of Josef Breuer. Freud and his era saw abreaction as a therapeutic end in itself. A more recent, linked concept is Trauma Reconstruction. Abreactions also happen spontaneously, e.g. flashbacks. [Shabtai Noy]
- Acute Stress Disorder/Acute Stress Reaction (ASD): is a DSM-IV classification for a condition where symptoms are similar to PTSD but for where the disturbance lasts for a minimum of 2 days and a maximum of 4 weeks and occurs
within 4 weeks of the traumatic event. ASR is related to the ICD-10 Classification. [4][Paul Burns]

- Adjustment Disorder of Adult Life: DSM-II published in 1968 replaced Gross Stress Reaction with ADoAL, under the heading of Transient Situational Disturbance. ADoAL was seen to occur without a pre-existing mental disorder. DSM-II listed only three examples of ADoAL - unwanted pregnancy, combat fear and death-row prisoners. [Paul Burns]

- Amnesia: "An inability to remember certain facts and experiences that cannot be attributed to ordinary forgetting" (McNally, 2003). It may be difficult to establish to what extent amnesia is psychogenic, e.g. major stress, as opposed to organic, e.g. a head injury. Anterograde amnesia refers to loss of memory of events after an event and retrograde to loss of prior memories. McNally states, "Psychogenic amnesia must not be confused with traumatic amnesia postulated to explain why someone might not remember childhood sexual abuse. Classic psychogenic amnesia begins immediately after the precipitating event; involves loss of personal identity; involves massive retrograde memory loss, not merely loss of memory for the precipitating event; rarely lasts more than a few weeks; and usually ends suddenly rather than gradually." (p189) [Paul Burns]

- Alexithymia: Coined by John Nemiah and Peter Sifneos (1970) to indicate a marked difficulty in experiencing, identifying, and communicating emotions. It is a description of the disruption of cognition and affect rather than a recognized disorder in itself. [Paul Burns]

- Associated Symptoms: "problems that don't come directly from being overwhelmed with fear, but happen because of other things that were going on at the time of the trauma".

- Bimodal/Biphasic: Describing the contrasting sets of trauma symptoms. Bessel van der Kolk (1994) writes, "... the trauma response is bimodal: hyper-amnesia, hyper-reactivity to stimuli and traumatic re-experiencing coexist with psychic numbing, avoidance, amnesia and anhedonia ... These responses to extreme experiences are so consistent across traumatic stimuli that this biphasic reaction appears to be the normative response to any overwhelming and uncontrollable experience." [Paul Burns]

- Bystander Traumatization: See Secondary Traumatization.

- Cognitive Restructuring: First use not yet identified. CR is a component in several approaches to therapy. The goal is to change unhelpful thinking through identification of dysfunctional thoughts, re-evaluation of beliefs, and replacing destructive ideas with constructive ones. [Paul Burns]

- Cognitive Therapy for Trauma Related Guilt: Developed by Edward Kubany (1998) and building on his work identifying erroneous beliefs in survivors of extreme events. It involves a trauma history assessment, assessing guilt,
identifying trauma related guilt beliefs, psychoeducation, dialogue to correct faulty thinking, and homework assignments. [Paul Burns]

- Combat Severity Indices: In his Traumatology article (available as pdf) Shabtai Noy (2001) reviews the literature and lists as objective indicators “...the length of stay at the battlefront, the number of actual combat days, the proximity of enemy fire, the number of comrades wounded and killed in action (WIA & KIA) in the vicinity of the soldier and ratios of these, e.g. number of WIA divided by combat days, etc.).” [Paul Burns] Combat Stress Determinants In his Traumatology article (available as pdf) Shabtai Noy (2001) includes the following as factors influencing the prevalence and type of Combat Stress Reaction. 1) Status of the War – e.g. winning, extent to which troops are moving when in combat 2) Quality of Leadership and Social Support 3) Norms and values of individuals and group 4) Available routes of evacuation - e.g. are psychiatric symptoms tolerated? 5) Who is available to listen and what behavior is assumed to be most effective with them? 6) Expectation effects – e.g. someone fearing a gas attack may exhibit symptoms of poisoning without gas 7) Intensity and duration. See also Combat Severity Indicators [Paul Burns]

- Combat Stress Reaction: According to Solomon (1993) an acute reaction of anxiety that may feature numbing, fainting, restlessness, psychomotor retardation, stuttering, withdrawal, vomiting, disorientation, paranoid thoughts and guilt. Shabtai Noy (2001) (available as pdf) proposes that CSR and the associated deterioration of functioning be seen as attempts to communicate to the system that combatants cannot take any more. See also Combat Severity Indicators and Combat Stress Determinants.

- Co-morbid / Comorbid: A simultaneous diagnosis, e.g. PTSD and Chronic Depression. See MCHP's Concept Dictionary for a fuller description of medical usage. [Paul Burns]

- Compassion fatigue: First used by Carla Joinson in 1992 in an article on nursing. The concept of CF was expanded and related more explicitly to trauma by Charles Figley (1995). Figley (2002, p.3) writes that "Compassion fatigue is a more user friendly term for secondary traumatic stress disorder, which is nearly identical to PTSD except that it applies to those emotionally affected by trauma of another..." Figley (2002) pp 4 & 7 compares PTSD and CF stressors and a list of CF symptoms. Introduction to CF by Charles Figley. See also Secondary Traumatization [Paul Burns]

- Complex Trauma or complex post-traumatic stress disorder (complex PTSD): Judith Herman (1992) proposed that trauma is best understood as a spectrum of conditions rather than as a single disorder. She proposed that the syndrome following prolonged, repeated trauma be called "complex post-traumatic stress disorder." NCPTSD C-PTSD fact sheet including symptoms. See also Continuous
Traumatic Stress Syndrome, Cumulative Trauma Disorder, DESNOS, Enduring Personality Change, Type I & II Trauma. [Paul Burns]

- Compulsive Cognitions Term: Used by Padmal de Silva and Melanie Marks (1999) for the repeated replaying of details of an extreme event, when people feel they have no or little choice but to do so. This can include reviewing images in a strict sequence. The images may be of what was actually witnessed, or an attempt to fill in gaps caused by amnesia or lack of knowledge, or may dwell on what might have happened had some factor been different. The authors link their term to "cognitive rituals", used by Stanley Rachman (1971). [Paul Burns]

- Concentration Camp Syndrome: In the late 1940s people working with Holocaust survivors began to identify symptoms such as apathy, anger, anxiety, disturbed sleep, anhedonia, intrusive thoughts, difficulty concentrating, hypervigilance, and depression, illogical feelings of guilt, impaired relationships and psychosomatic conditions. Later, Leo Eitinger (1980) and others linked the Syndrome more with the severity and length of imprisonment and less with the patient's pre-camp personality. See KZ Syndrome for first use. [Paul Burns]

- Conditioned Emotional Response: An emotional reaction to a stimulus that has been learned, perhaps with little or no conscious awareness. Lawrence Kolb (1984) described how these might be significant in some reactions to extreme events. John Briere (2002) writes; "These...responses are not encoded as autobiographical memories, but rather as simple associations between certain stimuli (e.g., the sudden raising of a hand) and certain responses (e.g., fear, leading to flinching). As a result they are not 'remembered', per se, but rather are evoked or triggered by events that are similar to the original abuse context..." Discussed in John Briere (2002) chapter available as pdf. [Paul Burns]

- Confabulation: Providing untrue details or elaborate stories, especially when not lying knowingly but in response to inability to recall the facts. Confabulation is sometimes associated with reactions to extreme events but also with brain injury and malnutrition. Roberta Sachs & Judith Peterson (1996) list reasons for confabulation. It is used to help hide gaps in time, to normalize past and present experiences, to shield against the intolerable, for secondary gain, to idealize the image of a significant other, and to keep secrets. Jacob Driesen's Glossary provides definitions of Personal, Momentary & Spontaneous Confabulations. [Paul Burns]

- Constriction: Defined by Judith Herman as "the numbing response of surrender: detached states of calm or dissociation impeding voluntary action, initiative, critical judgment and perception of reality." She places it alongside Hyper-arousal and Intrusion as one of the three main categories of PTSD symptoms. In her book (1988, p 45) Judith attributes the term to Janet who noted that amnesia could be due to a "constriction of the field of consciousness". Earlier in her book (pp 43-
43) Judith writes: "When a person is completely powerless, and any form of resistance is futile, she may go into a state of surrender...the helpless person escapes from the situation not by action but rather by altering her state of consciousness... Perceptions may be numbed or distorted with partial anesthesia or the loss of particular sensations." [Paul Burns]

- Constructivist Self Development Theory: CSDT was first expounded by Lisa McCann and Laurie Pearlman (1990). "Constructivist" refers to how each of us creates a unique, mental model of the world and events. These internal representations influence expectations, perceptions and other behavior. "Self-Development" emphasizes the importance of early experiences and, in trauma work, the need to deal with disrupted development of self-capacities and beliefs about self and the world. In CSDT trauma is seen as the result of interaction between experiences to date and the developing self's resources and mental models. Discussed in relation to self-harm in pdf article by Pearlman et al. [Paul Burns]

- Counter disaster Syndrome: Defined by Beverly Raphael (2000, p133) as "... a relatively non-productive behavior pattern sometimes seen in the post-disaster and recovery phases. Here people are overactive, over-conscientious but with loss of efficiency. Bustling activity of a purposeless nature is characteristic of this syndrome. People may be unwilling to finish their shift, be over-involved and believe they are indispensable, even though their efficiency is in fact diminished. This behavior should as far as possible be prevented by clear lines of responsibility, tours of duty and personal awareness." [Tony Taylor]- driving lessons for survivors recommendation

- Critical Incident Debriefing / Critical Incident Stress Debriefing: The use of group activities to help people involved in extreme events to make better sense of what happened and their reactions to it. The original Marshall Type Debriefing was used post-combat. There are a number of different approaches including Critical Incident Stress Management, Psychological Debriefing, Psychological First Aid, Group Stress Debriefing and Multiple Stressor Debriefing. Online information - 2002 Review by Litz et al. [Paul Burns]

- Critical Incident Stress Management: CISM is the Everly and Mitchell (1999) approach to Critical Incident Debriefing. The approach includes Introduction, Facts, Thoughts, Reactions, Symptoms, Teaching, Re-entry / what support is needed, follow-up and referral as needed. [Paul Burns]

- Cumulative Trauma Disorder: Ibrahim Kira (2001) appears to have been the first to write about CTD in relation to extreme events though the idea of compounded trauma has existed much longer, e.g. see Complex PTSD. Kira recognizes different types of CTD. “There are distinct groups of cumulative trauma disorders that result from different sequences or patterns of trauma within a life. Both
similar and varied traumatic events may contribute to a CTD. Thus, an infant repeatedly rejected by care givers may develop Cumulative Attachment Trauma Disorder. And an adult refugee may develop Survival CTD from disparate events before, during and after flight. The much rejected infant, the oft-traumatized refugee and other kinds of accumulated trauma present distinctive, symptomatic features.” (Personal communication, 2003). More information in Kira’s 2001 Taxonomy of Trauma article as pdf. Cumulative traumatic stress may be greater not simply because of repetition but also because of fearful anticipation, feelings of powerlessness and the frequency of the events. CTD is also used for the results of repeated physical traumas such as tennis elbow. [Paul Burns]- RTA support group sessions

- **Defusing**: An NCPTSD article which includes guidelines on defusing says the term has been used "to describe the process of helping through the use of brief conversation... Broadly speaking, defusings are designed to give survivors an opportunity to receive support, reassurance, and information. In addition, defusing provides the clinician with an opportunity to assess and refer individuals ... More specifically; defusing may help the survivor shift from survival mode to focusing on practical steps to achieve re-stabilization. It may also help survivors to better understand the many thoughts and feelings associated with their experience." Others (e.g. Council for Exceptional Children and Joseph A. Davis) put more emphasis on emotional venting. As yet I have not found a source that identifies the origin of "defusing" in relation to support for people who have undergone extreme events. [Paul Burns]

- **Delayed PTSD**: DSM-IV advises to specify PTSD "with delayed onset" if the symptoms appear at least six months after the stressor. In his NCPTSD overview of PTSD, Matthew J. Friedman notes that, "Longitudinal research has shown that PTSD can become a chronic psychiatric disorder that can persist for decades ... Patients with chronic PTSD often exhibit a longitudinal course marked by remissions and relapses." [Paul Burns]

- **Demobilization**: Within debriefings, particularly in the CISM approach, a short, transitional group intervention following an extreme event. Further information from Battle Born. [Paul Burns]

- **De-personalization / Depersonalization**: (UK / US spellings); First used by Gerard Heymans (1904). A form of dissociation involving emotional detachment and disorientation relating to the perception of self, body or mental processing. E.g. having the sense of watching oneself or a feeling like a character in a dream. There is a different usage in existentialism referring to a loss of personal identity and feelings of anonymity in complex society. [Paul Burns]
• De-realization / De-realization: (UK / US spellings) First used by Edward Mapother (reference sought) Changes in perception such that the environment seems unreal or alien or has the feel of a movie or stage set. [Paul Burns]

• DESNOS: Disorders of Extreme Stress, Not Otherwise Specified - often equated with Complex Trauma and sometimes linked to Enduring Personality Change. Significant disturbances in the following are linked to DESNOS. 1) Awareness (including amnesia, dissociation & depersonalization) 2) Perception of Self, Perception of Perpetrator 3) Relationships with Others 4) Personal Beliefs. According to Bessel van der Kolk (1996a), DESNOS was an attempt to make DSM-IV more comprehensive by reflecting research that linked persistent trauma to the compromise of the fundamental sense of self and ability to trust. However, the American Psychiatric Association did not formally recognize DESNOS as a diagnostic entity and instead listed it as a proposed additional criteria set to PTSD. A Trauma Center 2001 pdf article by Toni Luxenberg et al. includes DESNOS diagnostic criteria and a discussion of these. [Andrew Leeds & Paul Burns]

• DID: Dissociative Identity Disorder, see under Tertiary in Dissociation

• Disassociation: Robert Dilts (see below) attributes this concept to Milton Erickson. According to Dilts "Disassociation involves moving to or 'associating' into a different perspective" and is therefore distinct from dissociation which involves loss of elements of experience without necessarily changing perspective. Robert Dilts includes information on both terms in his online Encyclopedia of NLP. [Paul Burns]

• Disaster Syndrome: was first use by Anthony Wallace (1956) to describe responses to a tornado but since used for behavior following a variety of extreme events. The phases noted by Wallace were: 1) Dazed, disorientated, stunned, apathetic and passive 2) Heightened suggestibility, altruism, grateful for help, personal loss minimized, and concern for loved ones or the wider community 3) Euphoric identification with the community that has suffered and energetic involvement in restoration 4) Euphoria diminishes and more ambivalent feelings emerge, perhaps with the need to search for an explanation. The syndrome has been questioned by other researchers, e.g. the extent of apathy has been challenged. [Paul Burns]

• Dissociation: Colman (2001) defines dissociation as: Partial or total disconnection between memories of the past, awareness of identity and of immediate sensations, and control of bodily movements..." Van der Kolk, van der Hart & Marmar (1996b) propose that dissociation is used in three distinct but related ways. 1)Primary - when confronted with overwhelming threat and unable to integrate all that is happening into consciousness, sensory and emotional elements may not be integrated into personal memory and identity, remaining separated from ordinary consciousness. Fragmentation is accompanied by ego states that are distinct from
normal states of consciousness - e.g. flashbacks 2) Secondary - once in a traumatic / dissociated state further disintegration of elements of the experience can occur, such as the sensation of leaving the body and observing what happens at a distance thereby limiting the experience of pain. 3) Tertiary - (also known as Dissociative Identity Disorder) when people develop distinct ego states that contain the traumatic experience. One state may contain and express the fear or anger and another may appear to be unaware of the trauma. See also Somatoform Dissociation

- Dissociative Flashback Episode: Now usually abbreviated to Flashback.
- Dual Representation Model of PTSD: Chris Brewin et al. (1996) proposed that the complex phenomena of trauma is the result of the interplay between situational accessible memories (SAMS) and verbally accessible memories (VAMS). SAMS lead to spontaneous, intrusive images using sensory and vision-spatial cues rather than verbal information. Brief pdf article by Brewin. Updated model in Brewin & Holmes (2003). [Paul Burns]

- Early Insomnia: see Insomnia.
- Elaborated PTSD: Robert Kohlenberg and Mavis Tsai (1998) propose that the symptoms of PTSD are elaborated through repetitive, more frequent and longer-lasting trauma at the hands of a trusted caretaker. They suggest this has implications for treatment and contrast EPTSD with Circumscribed PTSD. CPTSD symptoms develop from limited physical trauma and correspond with the DSM-IV PTSD symptoms. [Paul Burns]

- Embedded Trauma: As yet no definitions or first use found. The term usually suggests that the shock of an overwhelming event has become fixed in one or more parts of the body, often resulting in disrupted energy flows. The client now may have no awareness of the extreme event or even the resulting dysfunction. Less frequently the implication is that the trauma is fixed more in the nervous system. I have found one author who has used embedded trauma to refer to the sort of situations peace keeping forces are asked to respond to. [Paul Burns]

- Enduring Personality Changes (EPC): Those not attributable to brain damage and disease ICD-10 lists this diagnostic category under "Disorders of Adult Personality and Behavior" and specifies that it "includes permanent changes after catastrophic experiences (such as hostage taking, torture, or other disaster) or severe mental illness" but excludes changes due to brain injury or disease. The changes include permanent hostility and distrust, social withdrawal, feelings of emptiness and hopelessness, increased dependency and problems with modulation of aggression, hypervigilance and irritability, and feelings of alienation. EPC is sometimes linked to Complex PTSD and DESNOS but the latter two are not part of ICD. See DESNOS for how this features in DSM-IV. [Paul Burns]
• Extreme Event: A term preferred by some as, unlike "Traumatic Event" or "Potentially Traumatic Event", it does not risk suggesting that it is the event alone that leads to trauma. While an extreme event may traumatize some, others may be relatively unscathed. Hence "reactions to extreme events" rather than "traumatic reactions" or "PTSD". See discussion in a chapter of a thesis by Anthony Theuninck (Thesis contents) [Paul Burns]

• Fear Structure: Along with Fear Network, Fear Structure refers to how information about frightening experiences has been organized in the nervous system to produce anxiety in response to certain stimuli. Lang (1977, 1979) described "fear structures" as consisting of information about: 1) the feared stimulus 2) verbal, physiological and behavioral responses 3) meaning of the stimulus and response. Foa & Kozak (1986) state that for anxiety to decrease the fear structure must be activated and cognitive and affective information incompatible with fear be made available and integrated. [Andrew Leeds]

• Flashback: Defined by Stephen Sonnenberg (1985) as "altered states of consciousness in which the individual believes he or she is again experiencing the traumatic event." Sonnenberg went on to say that, "As dramatic as a full-blown flashback can be, it is but one point on a spectrum of more or less subtle alterations in consciousness experienced by those suffering from PTSD." This is consistent with DSM IV which, under PTSD, lists "dissociative flashback episodes" as one way of acting or feeling as if the traumatic event were recurring. Flashbacks may be visual, auditory, and olfactory, felt in the body or involve a combination of senses. Chris Brewin & Emily Holmes (2003) note that the images and sensations are typically disjointed and fragmentary." First use in relation to trauma sought. [Paul Burns]

• Flashbulb Memory: Roger Brown and James Kulik (1977) proposed that sudden, dramatic, and emotionally arousing events leave vivid, detailed and enduring memories. There have been questions about the extent to which such memories are accurate. More Information - article by Ebbesen & Konecni. [Paul Burns]

• Formulation of Meaning: Robert Jay Lifton's (1968) term for a survivor's need to find meaning that makes sense of the trauma and the world she or he now inhabits. One of Lifton's Characteristics of Survivors. [Paul Burns]

• Hopelessness Theory: Building on the theory of learned helplessness, Lynn Abramson et al. suggests that perceptions of how negative the event is and how long its impact will last for are major determinants of the extent of hopelessness. See also Psychological self-tools. [Paul Burns]

• Hyper-accessibility: First used by Daniel Wegner and Ralph Erber (1992) to describe a form of heightened memory recall. Wegner notes that, "People trying not to think about a target thought show such hyper-accessibility - the tendency for the thought to come to mind more readily even than a thought that is the focus
of intentional concentration - when they are put under an additional mental load or stress." Writing about posttraumatic reactions, William Flack et al. (1998) refer to hyper-accessibility as the "extreme ease of retrieval...of trauma related memories." [Paul Burns]

- ICD-10: The World Health Organization International Classification of Diseases, 10th Revision, 1992. ICD-10 Mental Disorders summary. ICD-10 definition of PTSD. ICD-10 also includes Enduring Personality Change following extreme events. [Paul Burns]

- IES & IES- R: "Impact of Event Scale" and a revised version. The IES is a 15 item, self-rating questionnaire which also provides ratings for intrusion and avoidance - more information from Grant Devilly. The IES-R has 22 items and also assesses hyper-arousal - more information. [Paul Burns]

- Insomnia: Disrupted sleep is a symptom of many complaints, including reactions to extreme events. Initial or Early Insomnia is difficulty falling asleep after retiring. Middle Insomnia or Broken Sleep refers to interrupted sleep which is then difficult to return to. Late or Terminal Insomnia refers to early morning awaking, especially when tired yet unable to sleep. People with PTSD often report insomnia and this may involve all three stages. For many people insomnia has less stigma than other symptoms and therefore exploring sleep patterns may be a good place for a clinician to begin developing a fuller understanding. [Paul Burns]

- Narrative Exposure Therapy: A treatment for trauma resulting from organized violence using ideas from Testimony Therapy and CBT developed by Frank Neuner, Margarete Schauer and Thomas Elbert. "A form of exposure for clients with PTSD which encourages them to tell their detailed life history chronologically to someone who writes it down, reads it back to them, helps them integrate fragmented traumatic memories into a coherent narrative, and gives that to them at the end as written testimony..." Neuner's full definition further information. [Paul Burns]

- Narrative Memory: Bessel van der Kolk & Rita Fisler (1995), citing earlier works as well as their own research, distinguished between Narrative and Traumatic Memories. The former contain semantic and symbolic meaning, are adaptive, evoked at will by the narrator and can be condensed or expanded depending on context. Traumatic memories are dominated by images, sensations and feelings, do not condense or change over time and are automatically triggered. Their article is available at David Baldwin's Trauma Information. [Paul Burns]

- Nightmares: By themselves bad dreams are not evidence of previous trauma. In DSM-IV "Nightmare Disorder" is not used if there is another diagnosis, such as PTSD. Further information: James Pagel's medical overview of Nightmares and Disorders of Dreaming and Alan Siegel's Mini-course for Clinicians and Trauma Workers on Posttraumatic Nightmares. [Paul Burns]
• Panic Control Treatment: Developed by Michelle Craske and David Barlow (1993) from a cognitive-behavioral perspective. It aims to reduce panic through education, cognitive restructuring, breathing retaining and interoceptive exposure. Discussed in 1995 article by Barlow and Julia Turovsky. [Paul Burns]

• Repetition Phenomena: Defined by Roderick Örner and Peter Stolz (2002) as "Contemporaneously observed or reported reactions, manifested behaviors, feelings, cognitions, memories, or physical sensations; expressed on their own or in combination, that involve some degree of re-experiencing of significant past events (e.g. intrusive re-experiencing of trauma, recreation of trauma, transference, recurrent dreams, and acting out)." Their article reviews repetition and its relationship to memories, drawing on both empirical and therapist sources. [Paul Burns]

• Re-traumatization: (1) stressful and unhelpful re-experiencing of trauma. (2) Being reminded of something unpleasant. (3) A further experience of a traumatic event, such as repeated violence. [Paul Burns]

• Silencing Response: Anna Baranowsky coined the term in 1997, building on Yael Danieli’s (1980) studies describing a "Conspiracy of Silence" among therapists of trauma survivors. Danieli reported a tendency for therapists to limit their work when the client's memories appear unbelievable or incomprehensible or arouse strong feelings in the therapist. Baranowsky (2002) conceptualizes the Silencing Response as the inability of caregivers to listen attentively due to their own emotional response to the client's experiences. The response may involve redirecting the client to other topics, minimizing or neglecting discussions of the client's trauma memories. A series of assumptions lead to the Silencing Response, e.g. 1) this will hurt the client or me 2) this cannot be true 3) if this happened to you it could happen to me [Paul Burns]

• Sleep Paralysis: "...a condition in which someone, most often lying in a supine position, about to drop off to sleep, or just upon waking from sleep realizes that s/he is unable to move, or speak, or cry out. This may last a few seconds or several moments, occasionally longer. People frequently report feeling a "presence" that is often described as malevolent, threatening, or evil. An intense sense of dread and terror is very common." (J. Allan Cheyne, University of Waterloo website on this topic). The term appears to have been coined by Samuel Wilson (1928) though Silas Weir Mitchell (1876) called similar symptoms "night palsy." Cultural interpretation and folk terms for sleep paralysis such as "incubus experience", "witch riding" and "old hag attack" are discussed by Cheyne et al. (1999). [Paul Burns helped by correspondence from J. Allan Cheyne]

• Testimony Therapy: An approach to working with victims of political violence first used in Chile by Elizabeth Lira & Eugenia Weinstein (1983, published under the pseudonyms Cienfuegos, J. & Monelli, C. and listed under these names here).
Those who have experienced or witnessed human rights violations are encouraged to talk or write about their traumatic experiences with a view to promoting emotional recovery and, if the survivor agrees, providing a resource for social justice. Further information at University of Konstanz, in article by K.S. Pope and CMHR Bosnia. [Paul Burns]

- Trauma Reconstruction: A concept linked to the older one of Abreaction. The construct of "Trauma Reconstruction" emphasizes revisiting the traumatic memory in order to reconstruct cognitively a whole picture from the disassociated fragments. More information - online article "PTSD and the Consciousness Restructuring Process". [Shabtai Noy]

- Trauma Related Guilt: Edward Kubany (1998) and others have shown that guilt is a common response among survivors of different types of extreme events. Kubany has also identified a number of different types of erroneous thinking that generate or sustain guilt. The broad headings for these errors are - Faulty beliefs about pre-outcome knowledge, Faulty conclusions about justification, Faulty conclusions about causal responsibility, Faulty conclusions about wrongdoing, and Assuming affect associated with a thought is evidence of its validity. [Paul Burns]

- Traumatic Grief: Holly Prigerson et al (1995) listed symptoms that might distinguish between ordinary and traumatic or complicated grief. These symptoms are included in an online article - Managing Grief after Disaster. Complicated grief has elements of separation distress (e.g. crying, searching) and posttraumatic stress (e.g. disbelief, shock). Prigerson suggests that complicated grief comprises a discrete set of symptoms above and beyond bereavement-related depression and anxiety. [Paul Burns]

- Traumatic Memory Inventory: The TMI instrument gathers data on characteristics of traumatic memories that distinguish them from non-traumatic memories. Discussed in pdf. chapter on traumatic memory by Bessel van der Kolk et al. [Paul Burns]

- Traumatic Hysteria: Jean-Martin Charcot's term for hysteria caused by heightened emotions or sensations during an injury. Charcot (1825 - 1893) identified that the victim's beliefs about injury were significant both in determining the severity of the hysteria and speed of recovery. [Paul Burns]
Appendix 5: Map of Kisii County, Kisii Level 5 Hospital catchments

Map 1: Kisii Level 5 Hospital Catchments

Source: Google maps 2014 and http://sotkenya.com/-map. Adapted and customized