PSYCHIATRIC MORBIDITY AMONG PATIENTS WITH FACIAL INJURY AT MOI TEACHING AND REFERRAL HOSPITAL

BY

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A THESIS SUBMITTED IN PART-FULFILMENT FOR THE AWARD OF THE DEGREE OF MASTER OF MEDICINE IN PSYCHIATRY AT THE SCHOOL OF MEDICINE, DEPARTMENT OF MENTAL HEALTH, COLLEGE OF HEALTH SCIENCES, MOI UNIVERSITY

DECLARATION

I, Dr. Cleophas Juma Wafula, do hereby declare that this is my original work carried out in part- fulfillment of the requirements for the award of the Degree of Master of Medicine in Psychiatry (MMed. Psych.), Moi University and that I have not presented the same for the award of any other degree or to any other University.

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DEDICATION.

The research work is dedicated to Gerald, Sharleen, Kendra and Bellah who are ever by my side.

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ABBREVIATIONS AND ACRONYMS

APA	American Psychiatric Association
AUDIT	Alcohol Use disorders Identification Test
CME	Continuous Medical Education
DSM IV	Diagnostic and statistical manual of mental disorders IV
DSM-5	Diagnostic and Statistical Manual of mental disorders-5
HADS	Hospital Anxiety and Depression Scale
ICD 10	International Classification of Diseases tenth revision
IREC	Institutional Research and Ethics Committee
M.I.N.I	Mini International Neuropsychiatric Interview
MTRH	Moi Teaching and Referral Hospital
RTA	Road Traffic Accidents
SCID	Structured Clinical Interview for DSM IV
CIDI	Composite International Diagnostic Interview
WHO	World Health Organization

DEFINITION OF TERMS.

This study has adopted the American Psychiatric Association definitions as follows:

Psychiatric Morbidity; Presence of clinically significant disturbance in an individual's cognition, emotion regulation, or behavior that reflects a dysfunction in the psychological, biological,or developmental processes underlying mental function and leads to dysfunction in social occupation and other areas of important activities

Depressive Disorders; Presence of sadness, empty, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individuals' capacity to function.

Anxiety Disorders; Disorders characterized by an excessive emotional response to real or perceived imminent threat (fear) and anticipation of future threat (anxiety) and related behavioral changes.

Posttraumatic Stress Disorder; Trauma and stress-related condition characterized by exposure to actual or threatened death, serious injury, or sexual violence, resulting into the presence of intrusion symptoms, the persistence of avoidance of stimuli associated with trauma, negative alteration in cognition and mood, marked alterations in arousal and reactivity, lasting more than one month

Body Dysmorphic Disorder; Preoccupied with one or more perceived defect or flaws in physical appearance not observable or appear slight to others resulting into individual doing repetitive behavior, that cause clinically significant distress or impair socio-occupational functioning and not explained by body fat as in eating disorder

Schizophrenia; A psychotic disorder characterized by at least two of the following significantly present for one month, or lasting for six months, delusions hallucinations, disorganized thinking, disorganized motor behavior, and negative symptoms, in absence of schizoaffective, bipolar or depressive mood disorder, substance use disorder, or medical disorder

Facial Injury; Any physical alteration of the previously normal appearance of the face extending from mandibular angle to the hairline, resulting from any cause. (https://medical-dictionary.thefreedictionary.com/facial+injury)

ABSTRACT

Background: Psychiatric morbidity is the presence of clinically significant disturbance in an individual's cognition, emotion regulation or behavior and is diagnosed using the fifth edition of Diagnostic Statistical Manual criteria by American Psychiatric Association. A disfigured face resulting from a facial injury is a source of both objective and subjective stigma which predisposes one to psychiatric morbidity. Patients with facial injury in surgical units get inadequate psychological care. This complicates surgical care outcome and increases the cost of care. The burden of psychiatric disorders among patients with facial injury at Moi teaching and referral hospital is not known.

Objectives: To determine the prevalence of psychiatric morbidity, establish the pattern of psychiatric morbidity and assess the associations between socio-demographic/clinical characteristics and psychiatric morbidity among patients with facial injury at Moi Teaching and Referral Hospital (MTRH).

Methods: The study was a descriptive and analytical cross-sectional in which the mini international neuropsychiatric interview questionnaire was administered to diagnose the presence of psychiatric morbidity and a researcher-designed questionnaire was used to collect socio-demographic and clinical characteristics. The study was done at the surgical unit of MTRH where 90 consenting patients were interviewed from January to December 2017. Categorical data were summarized with frequency tables and percentages. Association between categorical variables was analyzed by chi-square and Fisher's exact test. Logistic regression was used to measure the association between psychiatric morbidity and sociodemographic/clinical variables.

Results: Ninety participants were evaluated, 77% were male. The mean age of the patients evaluated was 32±11 years. Seventy-one percent resided in rural areas. The commonest cause of facial injuries were road traffic accidents 51(57%), followed by interpersonal injuries 27(30%) and burns 11(12%). The prevalence of psychiatric morbidity among patients with facial injury at MTRH was 61.1%, of this 47.3% were diagnosed with more than one disorder. Twenty-five participants (28%) had alcohol use disorder: others included anxiety disorders 23(25.6%), depression 18(20%), other substance use disorder 13(14%), psychotic disorders 9(10%), attempted suicide 4(4%), and antisocial personality disorder 3(3%). The prevalence of alcohol use disorder among males was 35% compared to 5% among females (p=0.007). Compared to patients with facial burns patients with maxillary/ orbital fractures had 87.5% reduced odds of being diagnosed with psychiatric morbidity (AOR 0.125, P = 0.034 95%CI, 0.039, 0.859). Age, marital status, level of education, as well as cause and duration of injury were not statistically significantly associated with psychiatric morbidity.

Conclusion: The prevalence of psychiatric morbidity among patients with facial injury at MTRH is high with alcohol use, anxiety, with depressive disorder being the leading and often goes undiagnosed and untreated.

Recommendation: Routine screening for psychiatric morbidity among patients with facial injury should be initiated and comprehensive care offered. Prevention strategies for alcohol and other substance use disorders should be initiated targeting particularly males.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER ONE

INTRODUCTION.

1.1 Background.

Psychiatric morbidity is the presence of clinically significant disturbance in an individual's cognition, emotion regulation, or behavior that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental function and leads to dysfunction in social occupation and other areas of important activities(D.-A. P. Association, 2013). These disorders are diagnosed using criteria described in the fifth edition of Diagnostic Statistical Manual (DSM 5) or International Classification of Diseases tenth revision (ICD 10).

They include mood disorders such as bipolar mood disorders and depressive disorders, psychotic disorders such as schizophrenia, anxiety disorders such as generalized anxiety disorder, panic disorder, agoraphobia, social anxiety disorders and posttraumatic anxiety disorders. Others include eating disorders, personality disorders and substance use disorders among others.

The causes of psychiatric morbidity follow a bio-psychosocial model. Biological factor include exposure to toxins, inflammations, drugs, alcohol, poor diet, genetic aberrations, brain structural abnormalities and neurochemical dysfunctional. Psychosocial causes include stressors, parenting styles, negative childhood experiences, separations, migration, loss of jobs and poverty, among others.

Risk factors for psychiatric morbidity include family history of mental illness, exposure to stressful situations, having chronic medical and mental illness, alcohol and other substance abuse, traumatic brain injury, traumatic experiences, childhood neglect, among others (A. P. Association, 2013).

Psychiatric disorders among patients with facial injury are under recognized and undertreated. Lack of urgency, misinformation, and competing demands are blinding policy-makers and healthcare providers from taking stock of the situation (WHO 2017).

Facial injuries are physical trauma to the face that may involve bony or soft tissues. They are in form of fractures, lacerations, bruises, or burns. Maxillofacial injuries can be classified either as upper fractures, involving the frontal bone and sinuses, the middle fractures, which involves the nasal, ethmoid, zygomatic and maxillary bones and the lower fractures which involves the mandible bones. These injuries are caused by accidents such as road traffic accident and falls from heights, interpersonal violence such as fights, burns, and self-inflicted injuries.

Patients with facial injury are at higher risk of developing psychiatric morbidity than the general population (Gandjalikhan-Nassab, Samieirad, Vakil-Zadeh, Habib-Aghahi, & Alsadat-Hashemipour, 2016). This is because the face is the most important aspect of personality and identity. It also serves as a tool of communication Moreover disfigured face following trauma is a source of objective and subjective social stigma, discrimination and neglect (Bradbury, 2012). These patients may develop a mood disorder, anxiety, substance use disorders, body dysmorphic disorder, antisocial personality disorder, post-traumatic stress disorder (PTSD), among others (Bisson, Shepherd, & Dhutia, 1997; Levine, Degutis, Pruzinsky, Shin, & Persing, 2005). The resulting disfigurement may lead to them embracing the idea of seeking surgical correction. Therefore it is invaluable for the surgeon to understand and assess for these conditions before any operation. This will contribute to better treatment outcome and reduce the cost of care.

Some patients may also suffer or sustain a facial injury as a result of prior mental disorder. Some of the known mental disorders that predispose one to facial injury are depression, substance use, and dependence, alcohol use (Foletti et al., 2014), body dysmorphism, bipolar mood disorders, schizophrenia among others.

The surgical and psychiatric teams are needed to liaise in order to adequately address the psychological and surgical interventions needed in these patients (De Sousa, 2010a). The primary goal of plastic surgeons is to provide patients with the highest standards of surgical care and most members of these team have not been given adequate training to address psychosocial concern and also they are not often aware of psychiatric disorders that may be the cause of facial trauma (De Sousa, 2010a; Foletti et al., 2014). In Kenya, most surgeons depend on psychiatric knowledge attained during their basic training as undergraduates and therefore most would rather refer the patients to a psychiatrist for further management.

1.2 Statement of the problem

The number of patients with facial injuries across the world is high. It was estimated that 569000 people in the United Kingdom live with facial disfigurement (Faces, 2017) and in developing countries, maxillofacial injuries account for between 16% and 93.3% of all injuries seen at the maxillofacial outpatient clinic (Majambo et al., 2013; Singaram, G, & Udhayakumar, 2016). These patients have significant long term and short term psychiatric morbidity that leads to poor quality of life, complicated surgical outcome and increase in the cost of care (Bisson et al., 1997; Ukpong, Ugboko, Ndukwe, & Gbolahan, 2008).

Effective psychological treatment of psychiatric morbidity among patients with facial injury remains limited (De Sousa, 2010a).

Patients with facial injury are likely to have depression, anxiety, alcohol use disorder, other substance use disorder, and body dysmorphic disorder (Islam, Ahmed, Walton, Dinan, & Hoffman, 2012; Lui, Glynn, & Shetty, 2009; Debra A Murphy, Vivek Shetty, Judith Resell, Cory Zigler, & Dennis Duke Yamashita, 2009). If these problems are not well identified and treated early enough they may complicate the physical recovery and subsequent compliance to treatment and follow up (Islam, Hooi, & Hoffman, 2009).

Facial injury patients who attend general surgery clinic, plastic surgery clinic and those admitted at MTRH are not routinely screened and managed for psychiatric disorders. Therefore, the burden of psychiatric morbidity among patients with facial injury at MTRH is not documented.

1.3 Justification

The face plays an important function in an individual's sense of body image, personality, and identity (De Sousa, 2010a). When the facial appearance changes it leads to heightened concern which results in psychological distress (Rahtz, Bhui, Hutchison, & Korszun, 2018). Consequently, patients with acquired facial injuries experience social problems such as unemployment, low level of education and poor social support which further worsens the psychological distress (Levine et al., 2005). People with abnormal facial appearance experience negative effects on social functionality. According to Rankin and Borah, these people are rated as less honest, less employable, less trustworthy, less optimistic, less effective, less attractive among others (Rankin & Borah, 2003). Therefore patients with facial injury experience a high level of psychological distress that needs to be assessed and documented.

Moi Teaching and Referral hospital serves a large population from western Kenya, northern rift valley including South Sudan and eastern Uganda. Hence the findings will be more representative of the western Kenya population.

To date, there has been no local study on psychiatric morbidity among patients with facial injury, therefore the findings will provide baseline information in addressing the psychological needs of patients with facial injuries. Studies have been done in several parts of the world among patients with facial injury to determine psychiatric morbidity indicating different outcomes. It's known that facial appearance due to an injury can cause psychiatric disorder (Prashanth, Raghuveer, Kumar, Shobha, Rangan, & Rao, 2015). However, there is limited documentation, if any, about studies that were done in Kenya and especially at MTRH to evaluate psychiatric morbidity among patients with facial injury.

Fewer studies have been done in Africa and none in Kenya especially in western Kenya hence the findings will contribute to global knowledge and be the source of data for comparison. Consequently the study will improve patient management at MTRH.

Most documented studies have assessed specific disorders however the researcher used a tool that captures seventeen common psychiatric disorders as per Diagnostic and Statistical Manual of mental disorders-5(DSM 5).

1.4 Significance

Previous studies have shown that clinicians not only poorly document psychiatric symptoms in victims of trauma (Bisson et al 1997) but also hardly detect these conditions in their patients (Ndetei et al 2009). This study purposes to inform clinicians working in medical and surgical areas to adequately address the

psychosocial welfare of patients with facial injuries. This will translate into better surgical treatment outcome and reduced cost of care.

The world health organization recognizes the need to scale up human resource working in the mental health sector especially in low-income countries like Kenya where one psychiatrist cares for more than 200,000 patients (WHO Mental Health Action Plan 2013-2020). As such this study will also inform the hospital administration and policy makers on targeted human resource needs in training, updating,(e.g. continuous medical education, CME), upgrading(e.g. higher diplomas in psychiatry for clinical officers) and distribution within the hospital setting.

Kenya passed a mental health policy (D. Kiima & Jenkins, 2010) and a new constitution into (D. D. M. KIIMA & KEMPINSKI HOTEL, {Kramon, 2011 #10)} which every Kenyan has a right to health care services and right to be accorded special treatments. This study will inform policy and implementation of these laws.

The major purpose of the study is to improve the welfare of the patients in surgical wards and plastic surgery clinic; by availing the data on the findings, it is expected that the patients will be holistically managed, both physically and psychosocially.

1.5 Research question

What is the psychiatric morbidity among patients with facial injury at MTRH?

1.6 Research questions

1. What is the prevalence of psychiatric morbidity among patients with facial injury at MTRH?
2. What is the pattern of psychiatric morbidity among patients with facial injury at MTRH?
3. What is the association between causes of facial injuries/socio-demographic characteristics and psychiatric morbidity among patients with facial injury at MTRH?

1.7 Study objectives

1.7.1 Broad objective

To determine the psychiatric morbidity among patients with facial injury at Moi Teaching and Referral Hospital.

1.7.2 Specific objectives

1. To determine the prevalence of psychiatric morbidity among patients with facial injury at MTRH.
2. To establish the pattern of psychiatric morbidity among patients with facial injury at MTRH.
3. To assess the associations between causes of facial injury/socio-demographic characteristics and psychiatric morbidity among patients with facial injury at MTRH.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Psychiatric morbidity is the presence of clinically significant disturbance in an individual's cognition, emotion regulation, or behavior that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental function and leads to dysfunction in social occupation and other areas of important activities (A. P. Association, 2013). Psychiatric morbidity can result from inherited traits. The presence of certain genes increases the risk of developing certain psychiatric morbidity. Impaired brain neurochemical functioning environmental exposure to toxins, inflammations, and stressors may also lead to one developing psychiatric morbidity. Risk factors for psychiatric morbidity include family history of mental illness, exposure to stressful situations, having chronic medical and mental illness, alcohol and substance abuse, traumatic brain injury, traumatic experiences, childhood neglect, among others (A. P. Association, 2013)

Researchers have done tremendous work in describing psychiatric morbidity among different populations of patients worldwide. However, data on psychiatric morbidity among patients with facial injury is limited, especially in Africa. According to the WHO world health report 2018 October 25% of the world population will be affected by mental illness or neurological disorder in their lifetime. However only a third seek treatment from a health professional (WHO 2018). These diseases include major depressive disorders, bipolar affective disorder, schizophrenia, epilepsy, alcohol and other drug use disorders, dementia, post-traumatic stress disorder, obsessive and compulsive disorder, panic disorder, and primary insomnias among others. This is echoed by Steel et al, in a 2014 study, to determine global prevalence of common

psychiatric conditions among the general population where they found 29.2% (25.9–32.6%) of the interviewed to have had a common mental disorder in their lifetime of whom women had higher mood disorders (7.3%:4.0%) and anxiety disorders (8.7%:4.3%) during the previous year and men had higher rates of substance use disorders (2.0%:7.5%)(Steel et al., 2014) .

Bryant et al found that about a third (31%) of traumatic injury patients reported a mental disorder ; depression 9%, GAD 9%, PTSD 6% and agoraphobia 6% (Bryant et al., 2010).

Wilson in 2015 did a study among patients with maxillofacial injury at a tertiary hospital in the United Kingdom. He found a prevalence of 39% at 1 to 3 months after the injury and 27% at 6 to 9 months post traumatic events. Depression was 29% and PTSD was 23% at 1 to 3 months (Wilson, Holmes, Heke, Dain, & Bridle, 2015). These figures are higher than what Bryant et al and Steel et al found among general trauma patients and the general population respectively. Wong et al while looking at psychiatric needs and barriers to mental health care among patients with facial injury interviewed 62 patients on facial injury aftercare and reported that 31% had alcohol use disorders (AUD), 34% had posttraumatic stress disorder (PTSD) and 35% had major depression. They concluded that facial injury patients have profound mental health needs and preferred psychosocial aftercare (Wong et al., 2007). In Kenya, no study targeting patients with facial injury has been done. However Kwobah et al in 2017 while determining the prevalence of mental disorders in the Western Kenya community, where MTRH serves, found 45% of the participant to have a mental disorder. This is higher than WHO findings in general population. The majority had suicidal attempt, 16.4%, anxiety disorder, 15.7%, major depressive disorder, 12.3%, alcohol and substance use disorders 11.7% and psychotic episode 7.6%.

Consequently, it was found that only 3.6% had ever been diagnosed with a mental disorder (Kwobah, Epstein, Mwangi, Litzelman, & Atwoli, 2017).

2.2 The face and facial injuries

Facial injuries are physical trauma to the face that may involve bony or soft tissues. They are in form of fractures, lacerations, bruises, or burns. Maxillofacial injuries can be classified either as upper fractures, involving the frontal bone and sinuses, the middle fractures, which involves the nasal, ethmoid, zygomatic and maxillary bones and the lower fractures which involves the mandible bones.

The face is the seat of personal identity. It also serves as a tool of communication. The face is used to communicate emotional messages. One can easily asses a person's affect by looking at his or her face. People with abnormal facial appearance experience negative effects on social functionality. According to Rankin and Borah finding, these people are rated as less honest, less employable, less trustworthy, less optimistic, less effective, less attractive among others(Rankin & Borah, 2003). These causes psychological distress which results in psychiatric disorders (Levine et al., 2005{Bisson, 1997 #18)} among other medical conditions such as infections. This has resulted in many patients with facial injuries seeking aesthetic surgery with the ultimate goal of improving psychological wellbeing and prevention of infections (Lee et al., 2015).

According to the textbook of evidence-based surgery by Gordon et al several surgical operations can be done for these group of patients including rhinoplasty, blephaloplasty, otoplasty, rhitidenoplasty, collagen injection among others. He also states that some patients with personality disorders such as narcissistic, borderline and obsessive-compulsive may not be satisfied with the operation and may have

unrealistic expectations making them request for multiple procedures (Gordon & Cameron, 2000).

Studies examining the level of satisfaction after orthognatic surgery shows a higher satisfaction rate of above 70% (Hung, Chang, Vlantis, Tong, & van Hasselt, 2007). According to Tahir et al (Tahir, Raffi, Ibrahim, & Khan, 2015) surgical treatment resulted in improvement of social communication (67.5%) and self-confidence (75%). Dissatisfaction was associated with unrealistic expectations. However the number of patients studied was low at only 40(Tahir et al., 2015). In another study by Jan et al, 2010 it was concluded that aesthetic improvement was the main determinant factor for any satisfaction followed by functional problems, age and sex (Rustemeyer, Eke, & Bremerich, 2010).

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In the United Kingdom 569000 people live with facial disfigurement (Faces, 2017).

In India, the commonest causes of facial injuries are road traffic accidents 73.8% followed by falls18% assaults 6.7%. The people involved are mainly men 74.5% and women 25.5% aged 20 to 40 years mean age of 35 years (Singaram et al., 2016). However, Soares et al found the mean age of patients with facial injury to be 33.5 years majority 48% between 17 and 29 years and 28% were between 30 and 39 years. They also found the majority were male at 86% and the commonest cause of facial injury was road traffic accident (RTA) (Soares-Carneiro et al., 2016). In India, a study was done at the department of dentistry and they found 93,3% of all injuries were maxillofacial in nature (Singaram et al., 2016). Closer home in Nigeria, Taiwo et al found similar trends. Facial injuries were common among men at 95% and the cause was mainly RTA 81%, interpersonal fights, sports, industrial accidents and majority were between 21 to 30 years old (Taiwo, Soyele, Godwin, & Ibikunle, 2013,Ukpong, 2008 #75). Majambo, in 2013, found only 16% of patient attending the dental

department in a teaching hospital in Rwanda to have maxillofacial injuries. Murphy, in 2009, found the causes of facial injury among adolescents 14 to years 20 to be assaults 59%, accidents 29%, gunshot 9%, and sports 3% (D. A. Murphy et al., 2009) and the subjects were mostly male (86%).

A study done in Brazil also found facial injuries to be highest among men, 80.9% and between age groups 21 to 30 years, 29.9%. The leading causes of these injuries were road traffic accidents in 27.9%, interpersonal assault in 14.9%, and bicycle falls in 10.5%, respectively(Paes, de Sá Paes, Valiati, de Oliveira, & Pagnoncelli, 2012). A similar study done in Egypt had similar findings. The commonest causes were road traffic accidents, violence gunshot injuries and fall from height respectively, the patterns of injuries were; 83.2% were simple facial fractures and 16.7% were multiple facial fractures. Mandible fractures were commonest 51.6% of all fractures ($p < 0.05$), followed by zygomaticomaxillary fractures 25.6% and nasal fractures 16.7% (Mabrouk, Helal, Mohamed, & Mahmoud, 2014).

Body image

The body image is a perception that a person has over his/her physical appearance and thoughts and feelings that comes with that perception. When a person is satisfied with his or her appearance then that person has a positive body image however if he or she is dissatisfied then the person has a negative body image (Tiwari & Kumar, 2015).

There are several factors that affect body image. Burrowes, in 2013, identifies body size, media, social environment, genetic factors, age, gender, sexual orientation, ethnicity, education programmes, as factors that impact either negatively or positively to the body image (Burrowes, 2013). Rumsey in 2004 argued that people with disfigured facial appearance might experience negative emotions such as depression, social anxieties, negative self-perception such as reduced self-esteem, abnormal

thought processes such as fear of public evaluation (Rumsey & Harcourt, 2004). In another study, Levine et al notes that people with facial injuries experience a high rate of unemployment, marital problems, poor social support and low level of education (Levine et al., 2005). The prevalence of psychiatric illness among patients with facial injury is higher than the general population. These patients have higher rates of posttraumatic stress disorders, depression and anxiety body dysmorphic disorders, suicide substance abuse (De Sousa, 2010a, 2010b; Levine et al., 2005), and these disorders may impact negatively to both surgical treatment and rehabilitation outcome.

2.3 Depression and anxiety

Depression is a mood disorder characterized by depressed mood or lack of interest with four or more of the following symptoms; more than 5% loss or increased weight, insomnia or hypersomnia, poor attention and concentration, suicidal thoughts, psychomotor agitation or retardation, feeling worthless and hopeless, loss of energy. These symptoms should last more than two weeks and leads to interference with social occupation performance, and not attributed to a medical condition or drug use. In the United States the prevalence is 7% (A. P. Association, 2013).

Anxiety disorders are characterized by an excessive emotional response to real or perceived imminent threat (fear) and anticipation of future threat (anxiety) and related behavioral changes. The prevalence varies depending on the type of anxiety. In the United States it ranges from 1.7% to 9% (A. P. Association, 2013). They include agoraphobia, social anxiety disorders, panic disorders, generalized anxiety disorders specific phobias among others.

Most researchers determining the prevalence of psychiatric disorders among patients with facial injury found different results. However their result ranges between 11% and 39% for depression, and from 15% to 48% for anxiety. Factors associated with depression and anxiety are female gender, disfigurement, permanent scar, history of previous psychiatric illness, surgical mode of management, age between 15years and 35years, and being in a single marriage.

In a comparative study to compare the prevalence of depression and anxiety among facial injury patients in the United Kingdom, UK and Australia, Islam et al found the prevalence of depression was comparable in these two countries; at 20% UK and 11% in Australia while anxiety was 20.4% in UK and 15% in Australia. This study was done at tertiary university hospitals in both countries (Islam et al., 2012).

In another study to determine the association of depression and anxiety following facial injury, Shofiq Islam et al concluded that there is a need to carefully diagnose and treat psychiatric disorders among patients with facial injury. This followed findings that depression and anxiety were higher in patients with facial injury as compared with the control, (depression p-0.006 and anxiety p-0.07), and odd ratio for depression was 9.02 (95% CI 2.45, 33.01, p-0.001).The factors associated with depression were female gender, presence of permanent scar and history of previous psychiatric condition (Islam, Ahmed, Walton, Dinan, & Hoffman, 2010). They also showed, using hospital anxiety and depression scales (HADS), that there is a difference in prevalence of anxiety between surgically managed (21%) and conservatively managed (13%) facial injury patients. Almost similar rates were found for depression 14% compared to 13% for the two groups; surgically managed and conservatively managed; respectively (Islam et al., 2012). In a prospective study, Rahtz et al found slightly higher prevalence of depression 29% and anxiety 48%. In

this study HADS tool was used to collect data weekly (Alisic et al., 2014). He consequently found depression 39%, anxiety 43% and acute stress disorders 28% among facial injury patients in same hospital. Majority of these patients were male aged between 15 to 35 years (Rahtz et al., 2018). Prashanth et al, in a 2015 study, to compare depression and anxiety among disfigured and non-disfigured facial injury patients, found higher levels of both conditions among disfigured (mean HADS score was 8.1+-2.51 in non-disfiguring compared to 16.34+- 3.28 in disfiguring facial injury). Female gender was a factor associated with higher depression among disfigured patients with mean HADS score of 16.10+_2.87 at one month and 10.67+_0.95 at six months. The same trends were found among the non-disfiguring injuries (Prashanth, Raghuveer, Kumar, Shobha, Rangan, & Rao, 2015). A qualitative study among six facial burn patients by Mclean et al found that patients experienced changes on how they viewed themselves. They developed intense fear of death, panic, and terror. This study being qualitative represented personal views and could not be generalized to the general population. Hoogewerf et al in 2014 found no statistical association between severity of facial scar and depression and self-esteem among patients with facial burns (Hoogewerf, van Baar, Middelkoop, & van Loey, 2014).

In Nigeria, Nwashindi et al in 2014 found prevalence of 20% for probable depression and 8% for borderline depression. He also used HADS to evaluate these patients. Depression was significantly higher among females (32.61%) than males (12%). Depression was also much higher among the single patients (48.75%) as compared to those married (16.67%), divorced (08%) or widowed (42.86%).(Nwashindi, Dim, & Saheeb, 2014) A study looking at health related quality of life and incidences of depression among patients with facial injuries in Nigeria concluded that patients had poor quality of life and high rates of depression (Ukpong et al., 2008).

2.4 Alcohol and other drug use disorders

Alcohol use is a common cause of interpersonal violence (Keyes, Liu, & Cerda, 2012) which accounts for a major percentage of facial injuries (Arslan et al., 2014). It also contributes to poor healing of facial injuries (Guo & DiPietro, 2010) which might result in abnormal facial appearance. Patients with craniofacial injuries have higher odds of risk of alcohol use disorders compared to those without craniofacial injuries (McMinn et al., 2018).

The prevalence of alcohol use disorder ranges from 30% to 60% while that of other substance ranges from as low as 1% to as high as 55%. These patients are likely to be male, single, and low education level.

A study by Murphy et al in 2009 in which they interviewed vulnerable patients with facial injury, showed that 58% had problem drinking , 24% had problem drug use, 45% had at least used illegal drugs in the previous month (Debra A. Murphy, Vivek Shetty, Judith Resell, Cory Zigler, & Dennis Duke Yamashita, 2009). In 2010, Murphy et al consequently found 60% of the interviewed facial injury patients to have screened positive for alcohol use and 25% had problem drug use. They used alcohol use disorder identification test (AUDIT) and Texas Christian University Drug screen and substance use timeline as the tools for data collection. Only 20% of these patients had sought treatment (Murphy, 2010). Ogundare et al in his study among facial injury patients in urban set up found 55% of the patients had used illicit substance at the time of injury and 79% of all the injuries were as a result of interpersonal violence (Ogundare, Bonnick, & Bayley, 2003).

Serena-Gómez and Passeri did study among patients with mandibular fracture complications. They found 35.3% were smokers, 30.9% were chronic alcohol abusers and 1.8% were intravenous drug users (Serena-Gomez & Passeri, 2008).

In another study, Soares et al found the mean age of patients with facial injuries was 33.5 years. Most of which were males 86%, single 54% and 14% had never gone to school. The commonest cause of injuries were traffic accidents 57%. They also found 46% of all the participants had used moderate alcohol using AUDIT tool. They found no association between alcohol use and facial injuries (Soares-Carneiro et al., 2016). These findings were also found by Leite et al in Brazil, where males were 89.2%, commonest age group was 19 to 28 years and accidents were most common cause of facial injuries 23.7% followed by physical injuries 20.4%, unlike Soares, Leite found maxillary fracture to be commonest 29.1% and appositive association between alcohol use and facial injuries(p=0.002) (Leite Cavalcanti, Medeiros Bezerra, Moraes de Oliveira, & Granville-Garcia, 2010). In South Africa, McAllister et al found 47% of participants with facial injury screened blood positive for substance use and 40% screened blood positive for alcohol use (McAllister, Jenner, & Laverick, 2013).

2.5 Posttraumatic stress disorder

The posttraumatic disorder was previously classified as an anxiety disorder but in DSM 5 it is classified under trauma and stressor-related disorders. This disorder develops when an individual is exposed to a traumatic event. Later, they develop recurrent involuntary intrusive memories, dreams, flashbacks, psychological distress, and physiological reactions. These may lead to one avoiding stimuli associated with events and develop negative alteration in cognition and mood. The problem lasts more than a month and leads to social and occupation dysfunction. In the United States of

America the twelve month prevalence is 3.5% and lifetime prevalence is 8.7% (A. P. Association, 2013)

Prevalence of Posttraumatic stress disorder has been found to vary among patients with facial injury. Glynn et al in 2009 found a prevalence of 25% at one month post admission. Those who develop are likely to be elderly, female, distressed at the time of trauma, lacking in social support and experiencing stressful life events (Lui et al., 2009). In another study in 2010, Glynn et al found that the prevalence of PTSD at 12 months was 22.78%. It was also found that the disorder was high at one month post discharge (pds =14.14) than at 12 months (pds=10.43). However, the attrition rate was high at 43% and the instrument used was a self-reporting rather than interviewer administered (Glynn & Shetty, 2010). Lui et al in 2009 in another study, found that perceived social support had a direct influence on PTSD only when examined concurrently. Therefore, they concluded that high rates of PTSD symptoms were related to a diminished perception of available social support (Lui et al., 2009). Bison et al found 27% of facial injury patients with PTSD at seven weeks and the condition was common among those with assault injury fractures and higher HADS and Impact of Event Scale scores (IES). Roccia et al, in the study to determine the prevalence of acute symptoms stress disorder at 48hrs and three months after craniofacial surgery among the craniomaxillofacial injury patients found a prevalence of 44% with acute symptoms of stress at 48hrs and 26% with PTSD at three months.

CHAPTER THREE

METHODOLOGY

3.1 Study site

This study was conducted at general surgical inpatient wards, burns unit, maxillofacial outpatient clinics, and plastic surgery clinics at Moi Teaching and Referral Hospital (MTRH) in western Kenya. MTRH is located along Nandi road in Eldoret town in Uasin Gishu County in former Rift Valley province. This is the second largest national teaching and referral hospital in Kenya serving approximately 16.24 million people from western Kenya, Nyanza region, north rift valley region, South Sudan and eastern Uganda (www.mtrh.or.ke). Currently, it has about 800-bed capacity, of which 48 beds are for female surgical and 43 beds for male surgical patients. It has about 100-150% bed occupancy at any point in time. It offers both inpatient and outpatient services and specialized services such as kidney transplant, plastic surgery, child and adult psychiatry, alcohol and other substance of abuse rehabilitation among others. The plastic surgery clinic is held every Tuesday while the surgical outpatient clinic every Friday in room 60 and 61.

The hospital keeps both electronic and paper records which are easily available upon procedural request.

The patients who are suspected to have psychiatric disorders in the medical and surgical departments are reviewed by a liaison psychiatrist from department of mental health.

The hospital offers mental health services at the mental health unit and at alcohol and drug abuse rehabilitation center. The mental health unit provides inpatient treatment

and rehabilitative services such as occupational therapy, alcohol and drug abuse rehabilitation, home visits, among other services. The mental health unit has a bed capacity of 80, 46 beds for male, and 30 beds for female and 4 beds for pediatric patients. Mental health unit has over 100% bed occupancy at any single time.

It also offers outpatient services at the psychiatry outpatient clinics every Wednesday, forensic services, alcohol and drug abuse clinic and child psychiatry clinic every Monday.

The department also provides community outreach services at various health centers and special schools within and without the county. The unit enjoys services of six psychiatrists, 15 psychiatry residents, 5 psychiatric clinical officers, 25 nurses, 8 occupation therapist, 4 psychological counselors, and five social workers among others.

3.2 Study population

The study population were patients who presented at MTRH with facial injury. These are injuries involving the face, from the hairline to the mandible angle, resulting from any cause. Only those who met inclusion criteria were recruited.

3.3 Eligibility Criteria

3.3.1 Inclusion criteria

Patients seen at plastic surgery and maxillofacial surgery outpatient clinics of MTRH with facial injuries.

The patients admitted to general surgical wards and burns unit of MTRH due to facial injury.

Patients above 18 years of age diagnosed with facial injuries at MTRH.

3.3.2 Exclusion criteria

Patients with facial injury admitted because of other major surgical conditions as determined by the admitting medical officers.

Patients with facial injury on theatre list for operation and those within 48hours post operation to avoid preoperative or post-operative anxiety, depression, acute stress etc.

3.5 Sample size.

The researcher did a census study on the whole population of patients with facial injuries at Moi teaching and referral hospital.

According to hospital data in 2015, only 98 patients were diagnosed with facial injury. With these small population, it was worth interviewing all participants who made inclusion criteria because this could increase the power of the study and reduce selection bias.

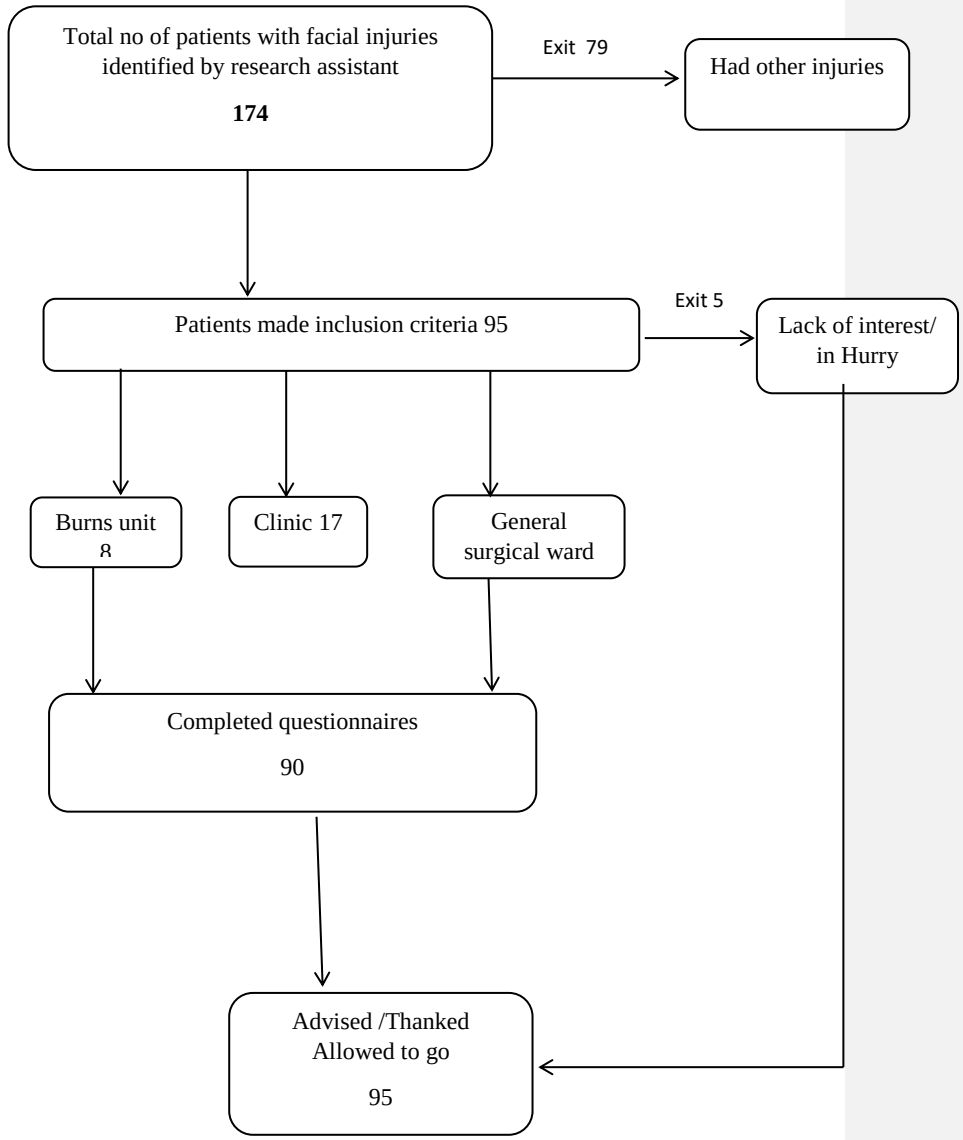
3.5 Research design.

The study design was a descriptive cross sectional study.

3.6. Study participant recruitment and enrollment.

The researcher enrolled all patients with facial injuries (174 participants) who sought services at plastic surgery clinic, maxillofacial surgery clinic and those who were admitted in general surgery wards of MTRH. Seventy nine (79) participants did not meet inclusion criteria. Five patients made inclusion criteria but declined to take part in the study. Two participants cited lack of interest in the study while three participants said they were in a hurry. I interviewed ninety (90) participants for the study from January 2017 to December 2017.

Recruitment schema.



3.7. Data collection methods

The data on psychiatric morbidity were collected using the mini international neuropsychiatric interview (M.I.N.I.) version 7 and the socio-demographic data were collected using researcher formulated face to face structured interview. The research assistant was engaged for the identification of the participants and administration of consent form.

3.8 Study implementation

Following the approval by the IREC the researcher applied and obtained an authority letter from the hospital administration authorizing him to carry out the research in the hospital. The researcher informed the surgical and burns unit ward members and also the plastic and maxillofacial surgery clinics of his intention to carry out the research within the departments. This was one on one meeting between the researcher and members of these departments. He identified a research assistant who was trained on how to administer the consent form and obtain consent from the participant. The assistant was also trained on how to identify and select the eligible participant based on inclusion and exclusion criteria.

After meeting the patient and doing a formal introduction, each patient was informed about the study, its importance to service provision and was requested to participate willingly. Upon accepting to take part they were requested to sign a consent form as a legal requirement and to show that they willingly accepted to participate. Upon signing the consent form the researcher administered the socio-demographic and mini international neuropsychiatric interviews. After interview, the researcher thanked the participant and allowed them to continue with the daily activities. If the respondents were found to have a mental disorder that need treatment the researcher immediately

referred them to the MTRH mental health team for emergency care and further follow up management as may be necessary.

Those who declined to be interviewed were thanked and allowed to go.

3.9 Study instruments

1. Socio-demographic data and clinical questionnaire.

This is a researcher-designed questionnaire that captures identification data and relevant demographic variables such as, sex, age, religion, marital status, occupation and level of education.

It also captures clinical variables such as previous history of mental illness, causes of facial injuries and surgical diagnoses. It is a face to face researcher administered questionnaire. It was administered in Kiswahili or English language.

2. The mini international neuropsychiatric interview questionnaire version 7.

This is an interviewer administered questionnaire that was designed to quickly capture major axis I psychiatric disorders including suicidality in DSM-5 and ICD-10. It has been used in different set up with high validity and reliability. Validation and reliability studies have been done to compare M.I.N.I. and CIDI and SCID-P and was found to have high scores, (> 0.6). Has specificity of 0.72 to 0.97, inter-rater of 0.88 to 1.00 and test retest reliability of 0.76 to 0.93.(Lecrubier et al., 1997). The tool can be administered in approximately 18.7+- 11.6 minutes. Require brief training for clinicians.(Sheehan et al., 1998). However it has not been validated in Kenya though has been used in several studies with comparable results.

It's available in multiple languages including Kiswahili, easy to administer and comprehensive with good reliability and validity. It is also an interviewer administered face to face structured interview.

3.10. Data management and analysis

The data collection tools; the M.I.N.I. and the clinical and socio-demographic questionnaires were coded during the design.

Data cleaning was done to check for completeness and inconsistencies at the end of each day. Data was entered into Epi Info, a statistical software for epidemiology developed by Centers for Disease Control and Prevention (CDC). Double entry was done to check for errors, validation rules and default values. A hard copy will be kept for 5-7 years for future references when need arises. This was done by the researcher to take care of confidentiality. The researcher used codes for different individual data for anonymity purposes. The computer is password protected and has firewall to avoid internet accessibility. Sharing over internet is encrypted and identification information e.g. age, date of birth is not being used.

Data analysis was done per objective at 95% confidence interval. Descriptive statistics was done for both continuous data and categorical data. Pearson's Chi-square test was used to test for association between the outcome and the categorical predictors. Two sample t-test was used to compare the means for continuous predictors. . Logistic regression was used to measure association between psychiatric morbidity and socio-demographic/clinical variables. Results were presented using tables, and narratives.

3.11 Ethical consideration

Approval to do the research was obtained from IREC.

Authority letter to carry out the study was obtained from the chief executive officer, Moi Teaching and Referral Hospital.

The informed consent form was signed by every patient who willingly agreed to take part after being explained to the purpose, process of the study and their right to or not to participate in the study.

The participants were assured of the confidentiality of the information given and they were given serial numbers to avoid including their names on the questionnaires and Consent form which are kept under lock and key, only accessible by the researcher and supervisors. Those willing to quit the study at the middle of interview were informed that they were free to do so when they so wish.

CHAPTER FOUR

RESULTS

Table 1 below shows the distribution of socio demographic variables by gender. Ninety participants were evaluated, majority, (77%) were male. The mean age of the participants evaluated was 32±11 years. Twenty four participants (27%) were below 25 years, thirty (38%), were between 25 to 34 years and only five participants (6%) were above 55years old. Slightly over half of the participants interviewed (56%) were married, thirty three (37%) were single and the rest were widowed, separated or divorced. As shown, over a half had attained a primary level of education (56%) only, while 16% had attained tertiary level of education (university 3% and middle level college 13%).

Most respondents were Christian (91%), half (51%) were self-employed while casual laborers were 40%. Majority resided in rural areas 71%.

Table 1: Distribution of sociodemographic variables by gender among 90 participants with facial injuries at MTRH from January to December 2017.

Variable	Male n=69(77%)	Female n=21(23%)	Total n=90(100%)
Residence			
Urban	18(26)	8(38)	26(29)
Rural	51(74)	13(62)	64(71)
Age mean(sd)	32±11	32±13	32±11
Age Category n (%)			
17 to 24	19(28)	5(24)	24(27)
25 to 34	24(35)	10(48)	34(38)
35 to 44	16(23)	3(14)	19(21)
45 to 54	7(10)	1(5)	8(9)
Above 55	3(4)	2(10)	5(6)
Marital Status n (%)			
Single	26(38)	7(33)	33(37)
Widowed	0(0)	1(5)	1(1)
Divorced	1(1)	0(0)	1(1)
Married	39(56)	11(52)	50(56)
Separated	3(4)	2(10)	5(6)
Religion n(%)			
Christian	61(88)	21(100)	82(91)
Muslim	0(0)	0(0)	0(0)
Hindu	0(0)	0(0)	0(0)
African Traditional Church	0(0)	0(0)	0(0)
Others	8(12)	0(0)	8(9)
Occupation n(%)			
Government Employed	1(1)	1(5)	2(2)
Private Sector Employment	20(29)	6(29)	26(29)
Self-Employment	37(54)	9(43)	46(51)
Unemployed	11(16)	5(24)	16(18)
Nature of Employment n(%)			
Permanent	5(7)	2(10)	7(8)
Casual	29(42)	7(33)	36(40)
Contracts	6(9)	3(14)	9(10)
Business	22(32)	5(24)	27(30)
Level of education n(%)			
University	2(3)	1(5)	3(3)
College	7(10)	5(24)	12(13)
Secondary	17(25)	8(38)	25(28)
Primary	43(62)	7(33)	50(56)

Prevalence and patterns of psychiatric morbidity.

Table 2 show distribution of different psychiatric disorders by gender among 90 participants with facial injuries at MTRH from January to December 2017.

Variable	Male n=69(77)	Female n=21(23)	Total n=90(100)	P value	Tests done
Psychiatric morbidity	43(62)	12(57)	55(61)	0.67	Pearson's Chi square
Major Depressive Disorder n(%)	12(17)	6(29)	18(20)	0.262	Pearson's Chi square
Suicidal attempt n(%)	3(4)	1(5)	4(4)	1.00	Fisher's exact test
Manic and Hypomanic Episode n(%)	4(6)	1(5)	5(6)	1.00	Fisher's exact test.
Panic Disorder n(%)	1(1)	2(10)	3(3)	0.135	Fisher's exact test
Agoraphobia n(%)	2(3)	3(14)	5(6)	0.081	Fisher's exact test
Social Anxiety Disorder n(%)	7(10)	3(14)	10(11)	0.693	Fisher's exact test
Obsessive Compulsive Disorder n(%)	1(1)	0(0)	1(1)	1.00	Fisher's exact test
Post-Traumatic Stress Disorder n(%)	11(16)	4(19)	15(17)	0.738	Pearson's chi square
Alcohol use disorder (Past 12 Months)	24(35)	1(5)	25(28)	0.007	Pearson's chi square
Substance Use Disorder Past 12 Months	13(19)	0(0)	13(14)	0.032	Pearson's chi square
Psychotic Disorders n(%)	5(7)	4(19)	9(10)	0.205	Fisher's exact test
Generalized Anxiety Disorder (Current)	0(0)	2(10)	2(2)	0.052	Fisher's exact test
Antisocial Personality Disorder (Lifetime)	2(3)	1(5)	3(3)	0.554	Fisher's exact test

The prevalence of any psychiatric disorders among patients with facial injuries at MTRH was 61%. A higher proportion of male participants had psychiatric morbidity as compared to females. However, this was not statistically significant (62% vs 57% p-value 0.67). According to the table, 20% of the total interviewed patients with facial injuries had major depressive disorder. Compared to male participants, female participants had higher proportions of major depression and post-traumatic stress disorders 29% vs 17% p-value 0.262 and 19% vs 16% p-value 0.738 respectively. Similarly, female participants with facial injuries were found to have higher

proportions of agoraphobia 14% vs 3%, p-value 0.081, and social anxiety disorders 14% vs 10% p-value 0.693.

The proportion of female with psychotic disorders were higher compared to males 19% vs 7% p-value 0.205 All the above were not statistically significant.

The proportion of participant with alcohol use disorder was 28%. More males compared to females were diagnosed with this disorder 35% vs 5% p-value 0.007. Similarly among the participant, males were found to have had substance use disorders in the previous 12 months (19% vs 0% p-value 0.032). There was a significant difference between males and females with alcohol and other substance use disorders (p-value 0.007 and 0.032 respectively).

In summary, females showed much higher levels of psychiatric disorders as compared to males apart from substance use disorder and alcohol use disorder. There was no statistical difference between male and female participants except for alcohol and substance use disorders.

Table 3 below shows the frequency of comorbidities gender among 90 participants with facial injuries at MTRH from January to December 2017. The prevalence of psychiatric morbidity was 61.1%. Of this, 47.3% were diagnosed with more than one disorder.

Table 3: shows the frequency of comorbidities gender among 90 participants with facial injuries at MTRH from January to December 2017

Sum_disorder	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	35	38.89	35	38.89
1	29	32.22	64	71.11
2	13	14.44	77	85.56
3	7	7.78	84	93.33
4	4	4.44	88	97.78
5	1	1.11	89	98.89
6	1	1.11	90	100.00

Table 4: Association of clinical variables and psychiatric morbidity among 90 participants with facial injuries at MTRH from January to December 2017

Variables	Psychiatric Morbidity: Yes n=55,(61%)	Psychiatric Morbidity: No n=35, (39%)	Total (n=90)	P – Value	Tests done
Treated for Mental Illness	6(11)	2(6)	8(9)	0.399	Fisher's exact test
Operation done	6(11)	5(14)	11(12)	0.634	Pearson's chi square
Place of Interview n(%)					
Plastic Surgery Clinic	12(22)	5(14)	17(19)	0.143	Pearson's chi square
General Surgical Ward	36(66)	29(83)	65(72)		
Burns Unit	7(13)	1(3)	8(9)		
Injury Duration n(%)					
Less than two weeks	34(62)	25(71)	59(66)	0.498	Pearson's chi square
Between two weeks and one month	11(20)	3(9)	14(16)		
Between one month and six months	6(11)	5(14)	11(12)		
More than six months	4(7)	2(6)	6(7)		
Causes of Facial Injury n(%)					
Burns	8(14)	3(9)	11(12)	0.032	Pearson's chi square
Accidents (Road Traffic falls?)	25(46)	26(74)	51(57)		
Interpersonal violence (Fights)	21(38)	6(17)	27(30)		
Diagnosis n(%)					
Facial burns	10(18)	3(9)	13(14)	0.138	Pearson's chi square
Facial STI	15(27)	9(26)	24(27)		
Mandible fracture	8(14)	3(9)	11(12)		
Maxillary/orbital fracture	8(14)	13(37)	21(23)		
Unspecified facial injury	14(26)	7(20)	21(23)		

Table 4 shows an association of clinical variables and psychiatric morbidity among 90 participants with facial injuries at MTRH from January to December 2017. The prevalence of psychiatric morbidity was 61%. Eight (9%) participants had been

previously managed for mental illness while 91% had never been diagnosed with any mental illness before. The commonest cause of facial injuries were accidents such as road traffic accident, fall from heights, occupational accidents (57%), followed by interpersonal injuries such as fights (30%) and burns (12%). Self-inflicted injuries accounted for only 1%.

The commonest diagnosis was facial soft tissue injuries such as a cut wound, eyeball burst, lip tears. This accounted for 27%, followed by maxillary fractures and unspecified facial injury 23% each. The facial burns accounted for 14 % while mandible fractures were 12%.

According to this table, the majority of participants were interviewed at the surgical inpatient wards (72%), compared to the plastic outpatient clinic (19%) and burns unit 9%.

Compared to participants without psychiatric morbidity, a significantly higher proportion of participants whose injuries were caused by burns and interpersonal violence were diagnosed with a psychiatric morbidity (14% vs 9%) and (38% vs17%) respectively (p-value 0.032). However a significantly lower proportion of participants whose injuries were caused by road traffic accidents were diagnosed with a psychiatric morbidity 46% vs 76% (p-value 0.032).

As shown in table 3 above the place of interview and the surgical diagnosis had no statistical difference between participants with psychiatric morbidity and those with no psychiatric morbidity.

Table 5: Unadjusted odds ratio for sociodemographic and clinical variables among 90 participants with facial injuries at MTRH from January to December 2017.

Variable	Odds Ratio	P - Value	95% C.I
Gender : Male	1.241	0.67	[0.46,3.345]
Residence; urban	1.026	0.958	[0.403,2.616]
Marital Status : Married	2.334	0.055	[0.982,5.548]
Education Level			
Tertiary	Ref		
Secondary	0.394	0.188	[0.099,1.578]
Primary	0.594	0.424	[0.166,2.132]
Age	1.054	0.026	[1.007,1.103]
Causes of Facial Injury			
Burns	Ref		
Accidents (Road Traffic falls)	0.361	0.164	[0.086,1.516]
Interpersonal violence (Fights)	1.313	0.74	[0.264,6.55]
Diagnosis n(%)			
FACIAL BURNS	Ref		
FACIAL STI	0.501	0.375	[0.109,2.315]
MANDIBLE FRACTURE	0.801	0.813	[0.126,5.092]
MAXILLARY/ORBITAL FRACTURE	0.185	0.034	[0.039,0.881]
UNSPECIFIED FACIAL INJURY	0.601	0.526	[0.124,2.906]

Table 5 shows unadjusted odds for socio-demographic and clinical variables among 90 participants with facial injuries at MTRH from January to December 2017.

The odds of being diagnosed with psychiatric morbidity is increased by 24% for male patients with facial injuries compared with female patients, UOR=1.241(95% CI: 0.46, 3.345).

Participants who were married had 133% higher odds of being diagnosed with any psychiatric morbidity as compared to participants who were not married; UOR=2.334 (95%CI: 0.982, 5.548).

Compared to those with tertiary education, the patients who had attained primary and secondary levels of education had 40.6% and 60.6% reduced odds respectively of

being diagnosed with any psychiatric morbidity UOR=0.594 (95%CI: 0.166, 2.132) and UOR=0.394 (95%CI: 0.099, 1.578) respectively.

The odds of being diagnosed with psychiatric morbidity is reduced by 81.5% among participants with maxillary and orbital fractures compared to those with facial burns, UOR=0.185(95%CI: 0.039, 0.881). The odds of being diagnosed with psychiatric morbidity reduced by 11.7% for patients who had injury duration between one month and six months compared to those with injury duration less than two weeks UOR=0.883(95% CI: 0.242, 3.22). However, these odds increased by 169.7% UOR=2.697 (95%CI: 0.681, 10.686) for participants with injury duration between two weeks and one month and by 47.1% UOR=1.471 (95%CI: 0.25, 8.67) for participants with injury duration more than six months.

Compared to burns as a cause of facial injuries, road traffic accidents had 63.9% reduced odds UOR=0.361 (95%CI: 0.086, 1.516) while interpersonal violence had 31.3% increased odds UOR=1.313 (95%CI: 0.264, 6.55) of being diagnosed with any psychiatric morbidity.

When these variables were applied to multivariate regression, the odds of being diagnosed with psychiatric morbidity significantly reduced by 87.5% among participants with maxillary /orbital fractures compared to facial burns AOR=0.125 (95%CI: 0.019, 0.859). However the odds of being diagnosed with psychiatric morbidity increased by 64.1% among married participant compared to unmarried participants AOR=1.614 (95%CI: 0.454, 5.931) table five below. This was not statistically significant.

Table 6: Adjusted Odds Ratio for sociodemographic and clinical variables among 90 participants with facial injuries at MTRH from January to December 2017.

Variable	**Odds Ratio**	**P - Value**	**95% C.I**
Gender : Male	2.436	0.181	[0.661,8.987]
Residence: urban	0.869	0.812	[0.274,2.764]
Age	1.028	0.376	[0.968,1.093]
Marital Status : Married	1.641	0.451	[0.454,5.931]
Religion : Christian	0.63	0.634	[0.094,4.244]
Education Level n(%)			
Tertiary	Ref		
Secondary	0.37	0.258	[0.066,2.074]
Primary	0.321	0.168	[0.064,1.613]
Injury Duration n(%)			
Less than two weeks	Ref		
Between two weeks and one month	2.045	0.389	[0.403,10.39]
Between one month and six months	0.587	0.525	[0.114,3.031]
More than six months	1.164	0.886	[0.146,9.296]
Diagnosis n(%)			
FACIAL BURNS	Ref		
FACIAL STI	0.323	0.259	[0.046,2.307]
MANDIBLE FRACTURE	0.599	0.642	[0.069,5.211]
MAXILLARY/ORBITAL FRACTURE	0.125	0.034	[0.039,0.859]
UNSPECIFIED FACIAL INJURY	0.301	0.246	[0.04,2.285]

CHAPTER FIVE

DISCUSSION

Psychiatric disorders are common conditions in any population. According to the World Health Organization, one in every four people in the general population suffers from some form of mental disorders. Especially in sub-Saharan Africa. It's important to point out that few cross-section hospital-based studies have reported on the prevalence of psychiatric disorders among facial injury patients. These studies dwelled on specific disorders such as depression, substance use disorder, or anxiety disorder in this population. In my study, the prevalence of psychiatric morbidity among facial injury patients at Moi Teaching and Referral Hospital was 61.1%. Of this, 47.3% were diagnosed with more than one disorder. A large proportion (91%) had never been diagnosed or treated for psychiatric morbidity Prevalence of alcohol use disorder was 28%, anxiety disorders 25.6%, depressive disorder 20%, other substance use disorders 14%, psychotic disorders 10%, and antisocial personality disorders 3%. Compared to participants with facial burns, patients diagnosed with maxillary/orbital fractures were less likely to be diagnosed with psychiatric morbidity. There was no significant association between sociodemographic variables and psychiatric morbidity.

5.1 Prevalence of psychiatric morbidity.

The prevalence of psychiatric morbidity at MTRH was 61%. A study by Wilson et al in 2015 among patients with facial injury in the United Kingdom also found a very high prevalence of 39 % between one month and three months (Wilson et al., 2015). The difference in prevalence could be due to the different methodology used. While Wilson et al collected data from one month to nine months after the injury I included participants who were less than a month after sustaining facial injuries. Longitudinal

studies have shown that the prevalence of psychiatric morbidity among patients with facial injury reduces with time (Glynn & Shetty, 2010; Wilson et al., 2015). Also this could be explained by the type of study. While I did a cross-sectional study Wilson et al in 2015 did a longitudinal study.

This prevalence is higher than general population prevalence of 25%. This could be because when the facial appearance changes it leads to heightened concern which results in psychological distress(Rahtz et al., 2018) Patients with acquired facial injuries experience social problems such as unemployment, low level of education and poor social support than the general population(Levine et al., 2005). Similarly, people with abnormal facial appearance experience negative effects on social functionality (Rankin & Borah, 2003).

Patterns of psychiatric disorders.

My study reveals that the most frequently occurring mental disorder was alcohol use disorder 28%, followed by anxiety disorder 24.4% depression 20%, substance use disorders14%, Psychotic disorders 10%, Mania and hypomanic episodes 6%, suicidal attempt 4%, and antisocial personality 3%. In comparison, Wilson found depression 29%, alcohol use disorder 2%, PTSD 23% general anxiety disorders 21%, drug dependence 5%, drug abuse 1% any alcohol/ drug dependence/ drug abuse 11% (Wilson et al., 2015). This could be because of different tool and methodology used.

5.2 Alcohol and substance use disorders.

Murphy observed the need to screen for alcohol and substance use disorder and refer patients for specialized treatment by the maxillofacial and other trauma surgeons (Murphy, 2010). This is because alcohol use disorder and substance use disorder are highly prevalent among patients with facial injury. They interfere with wound healing

and they are also risk factors for facial injury. In this study, the commonest occurring psychiatric disorder was alcohol use disorders with a prevalence of 28%. I found that men had a significantly higher prevalence than women (35% vs 5%p- value 0.007). The prevalence of substance use disorder was 14%.the participants with substance use disorders were mainly male. Murphy et al in 2009 found 58% of patient who presented with intentional facial injury at an urban hospital had problem drinking more than 50% had illicit substance use and 25% had problem drug use (Debra A Murphy et al., 2009). In a study done in Brazil in Restauração Hospital in 2016, the researcher found a higher prevalence of 46% moderate use and 39% risk use of alcohol using the AUDIT scale. Just like our study majority were men 86% (Soares-Carneiro et al., 2016). Another study in Brazil by Carvalho et al 2010 found alcohol and substance use prevalence of 41.1% among patient with facial injury. This was a retrospective study. Majority 91% were also male (Carvalho et al., 2010).

Similarly, in South Africa McAllister in 2013 found a higher prevalence of alcohol use (40%) and illicit substance use (47%)(McAllister et al., 2013).

The difference in prevalence could be because of different tool used, while Soares et al in 2016 used AUDIT (Soares-Carneiro et al., 2016) in this study, MINI was used. Screening tools such as AUDIT tend to report higher rates than diagnostic tools. Different methodology can explain why McAllister's and Carvalho's are different. McAllister, in addition to interview, did urine sample testing (McAllister et al., 2013) while Carvalho did a retrospective study. Some participants might not be willing to give true information concerning their alcohol drinking behavior.

Regions with higher economic wealth like the United States of America, South Africa and Brazil have a higher prevalence of alcohol consumption. According to WHO 2018 report on global status on alcohol and health, “the greater the economic wealth of a country, the more alcohol is consumed and the smaller the number of abstainers” (WHO 2018). From the same study by WHO 2018, it’s stated that prevalence of alcohol use is high in America region, European region and Western Pacific regions compared to African region and the Mediterranean region (WHO 2018).

5.3 Depression and Anxiety

This survey found the prevalence of anxiety disorder to be 25.6% and depression to be 20%. The proportion of depression and anxiety was higher in women than men. Social anxiety disorder accounted for 11%, panic disorders 3%, generalized anxiety disorder 2%, agoraphobia 6% and posttraumatic stress disorder 17%. In a study by Islam et al in 2010 among UK population with facial injuries, the prevalence of depression was 20% while anxiety was 20.4%(Islam et al., 2010). Similarly in Nigeria Nwashindi et al 2014 found the prevalence of depression among patients with facial injuries to be 20% and that of anxiety to be 21% (Nwashindi et al., 2014). However higher prevalence of depression 29% and anxiety 48% were found by Rahtz et al 2018 in their study at the Royal London hospital (Rahtz et al., 2018). This high prevalence might be because Rahtz’s study was a prospective study as opposed to descriptive cross-sectional study and self-reporting as opposed to interviewer administered.

Different risk factors place a patient with facial injury at a higher risk of anxiety and depression than the general population. Some of these factors include unemployment, lower education level, poor social support which is reported to be higher among patients with facial injury compared to general population (Levine et al., 2005). Facial disfigurement leads to a negative self-image which coupled with other factors may

increase prevalence of anxiety and depression among people with facial injury (McGrouther, 1997). Other medical, social, psychological, and personal factors may increase the risk of developing depression and anxiety among patients with facial injuries (Cunningham, 1999).

Posttraumatic stress disorder.

In this study, the prevalence of posttraumatic stress disorder was 17%. This is lower than what other researchers found. Bison found 27% (Bisson et al., 1997) Roccia found 26% (Roccia, Dell'Acqua, Angelini, & Berrone, 2005) while Glenn found 22.7% (Lui et al., 2009). Lui notes that, patients who have good social support were found to have lower rates of PTSD (Lui et al., 2009). This could explain these differences in prevalence because most patients with trauma in Kenya get good social support.

5.4 Sociodemographic and clinical characteristics.

In my study, compared to facial burns, being diagnosed with maxillary/orbital fractures was significantly associated with reduced odds of having psychiatric morbidity. However no statistically significant association between psychiatric morbidity and different causes of facial injuries such as burns, accident and violence.

Wilson et al looked at multiple psychiatric disorders among patients with facial injury in the United Kingdom and found no association between psychiatric morbidity and type facial injuries at 1 to 9 months post facial injuries. (Wilson et al., 2015).

However, Prashanth et al in 2015 did comparative studies on the severity of anxiety and depression among disfigured and no disfigured facial injury patients. He found a significant difference between these two groups with disfigured having higher

severity of the disorders. Female gender was highly associated with anxiety and depression compared to male gender in patients below 50 years. However above 50 years gender was not a significant factor associated with either depression or anxiety (Prashanth, Raghuveer, Kumar, Shobha, Rangan, & Hullale, 2015). These differences could be explained by different study designs, while we did a cross-sectional study Prashanth et al 2015 did a comparative study. Also, this study did not compare disfigured verses no disfigured in our study. They also looked at only depression and anxiety while in our study we looked at several psychiatric morbidities. Therefore the difference in methodology could explain differences in findings.

In another contrasting study at a university hospital in the United Kingdom, female gender, presence of a permanent facial scar, past psychiatric history, and self-perception of the disfigured face was found to be associated with depression however only female gender was associated with anxiety disorder among facial trauma patients (Islam et al., 2010). Female gender was also noted to be associated with depression among patients with facial injuries (Roccia et al., 2005). In this study, there was no inclusion of variables such as the perception of disfigurement and permanent scars.

However, Hoogewerf found no association between the severity of facial burn scars and depression and self-esteem(Hoogewerf et al., 2014). This is unlike Tebble who found the length of scar more than 4cm, being single and assault were associated with high scores of anxiety(Tebble, Adams, Thomas, & Price, 2006).

In Nigeria, female gender, being employed and being single was statistically significantly associated with depression and anxiety among patients with facial injuries (Nwashindi et al., 2014).

The differences between our study and these other studies are that most of these studies were looking at the association of mainly depression and anxiety and facial injuries. However, in this study, several psychiatric morbidities were looked at. The tools used were mainly HADS while the MINI tool was used in my study. The studies were done in different countries with different culture and different understanding of mental illnesses.

The study strength.

Being the first study to document prevalence of psychiatric morbidity among patients with facial injury at MTRH it will inform focused psychological management of these patients.

The study provides data that will inform training and distribution of mental health staffs within the hospital.

5.5 The study limitation

Being a descriptive study, there were no interventions done.

The study cannot show a causal effect relationship between facial injury and psychiatric morbidity.

The population under study was limited therefore reducing the power to do certain analysis.

Excluding patients who had facial injuries but presented with other surgical diagnoses limited the scope of the study.

The tool that was used has not been validated in Kenyan setup.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The prevalence of psychiatric morbidity at MTRH was 61%, of this 47.3% were diagnosed with more than one disorder. This prevalence is higher than the general population prevalence.

Prevalence of alcohol use disorder was 28%, anxiety disorders 25.6%, depressive disorder 20%, other substance use disorders 14%, psychotic disorders 10%, and antisocial personality disorders 3%.

Compared to participants with facial burns, patients diagnosed with maxillary/orbital fractures are at a lower risk of being diagnosed with psychiatric morbidity.

A large proportion (91%) have never been diagnosed or treated for psychiatric morbidity.

6.2 Recommendation

There is need for routine screening, assessment and early further comprehensive management of the patients with facial injury found to have psychiatric morbidity.

This will improve quality of life, reduce surgical complications, hospital stay and cost of care to patients with facial injury.

Prevention strategies for alcohol and other substance use disorders should be initiated targeting particularly males.

Following high prevalence of psychiatric morbidity among patients with facial injury at MTRH, there is need to do a longitudinal study to assess temporality of outcome and predictors.

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APPENDICES

Appendix 1.Timelines

Develop research concept and present to the department…… November 2015

Develop proposal ……..…… January 2016

Presents proposal to IREC…….April 2016

Data collection…… January to December2017

Data analysis……January 2018

Report writing…… April 2018

Presentation …… June 2018

Appendix 2.financial budget.

ITEM	**KShs.**
Stationary, printing and photocopy	50,000.00
Computer services	50,000.00
Local transport	30,000.00
Telephone services	10,000.00
Data analysis	30,000.00
Miscellaneous	10,000.00
Total	**180,000.00**

Appendix 3: Socio-demographic questionnaires

1. Patients Serial number……

2. State the place of interview.

    1. Plastic surgery clinic
    2. General surgical wards
    3. Burns unit
    4. Others specify……..

3. Working diagnoses ……..

3. Have you ever been treated for mental illness?

    1. Yes (Specify……..)
    2. No

4. Have you ever had operation for this facial injuries?

    1. Yes
    2. No

5. Do you have any other injuries a part from facial injuries?

    1. Yes
    2. No

6. How long ago did your sustain this facial injuries?

    1. Less than two weeks
    2. Between two weeks and one month
    3. Between one month and six month
    4. More than six months

7. What is your Sex?

    1. Male
    2. Female
    3. Others specify…….

8. How old are you? (In years) …….

9. What is your marital status?

    1. Single
    2. Widowed
    3. Divorced
    4. Married
    5. Separated

10. Where do you reside?

    1. Town
    2. Rural

11. What is your religion?

    1. Christian
    2. Muslim.
    3. Hindu
    4. African traditional church
    5. Others

12. What is your Occupation?

    1. Government employed
    2. Private employed
    3. Self employed
    4. Not employed

13. Nature of employment

    1. Permanent
    2. Casual
    3. Contracts
    4. Business

14. Level of education

    1. University
    2. College
    3. Secondary
    4. Primary
    5. None

15. Causes facial injury

    1. Burns
    2. Accidents (road traffic accidents falls)
    3. Interpersonal violence (such fight)
    4. Personal violence (such as attempted suicide)

Appendix 4: Mini international neuropsychiatric interview questionnaire

Appendix 5: Chief Executive Officer Authority letter

MOI TEACHING AND REFERRAL HOSPITAL

Telephone: 2033471/2/3/4
Fax: 61749
Email: director@mtrh.or.ke
P. O. Box 3
ELDORET

Ref: ELD/MTRH/R.6/VOL.II/2008

8th September, 2016

Dr. Cleophas Juma Wafula,
Moi University,
School of Medicine,
P.O. Box 4606-30100,
ELDORET-KENYA.

RE: APPROVAL TO CONDUCT RESEARCH AT MTRH

Upon obtaining approval from the Institutional Research and Ethics Committee (IREC) to conduct your research proposal titled:-

"Psychiatric Morbidity among Facial Injury Patients at Moi Teaching and Referral Hospital".

You are hereby permitted to commence your investigation at Moi Teaching and Referral Hospital.

08/09/2016
DR. WILSON ARUASA
CHIEF EXECUTIVE OFFICER
MOI TEACHING AND REFERRAL HOSPITAL

CC - Deputy Director (CS)
- Chief Nurse
- HOD, HRISM

Appendix 6: Institutional Research Ethics Committee approval letter

INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)

MOI TEACHING AND REFERRAL HOSPITAL
P.O. BOX 3
ELDORET
Tel: 33471//2/3

MOI UNIVERSITY
SCHOOL OF MEDICINE
P.O. BOX 4606
ELDORET

Reference: IREC/2016/94
Approval Number: 0001723

1st September, 2016

Dr. Cleophas Juma Wafula,
Moi University,
School of Medicine,
P.O. Box 4606-30100,
ELDORET-KENYA.

INSTITUTIONAL RESEARCH & ETHICS COMMITTEE
01 SEP 2016
APPROVED
P. O. Box 4606-30100 ELDORET

Dear Dr. Wafula,

RE: FORMAL APPROVAL

The Institutional Research and Ethics Committee has reviewed your research proposal titled:-

"Psychiatric Morbidity among Facial Injury Patients at Moi Teaching and Referral Hospital".

Your proposal has been granted a Formal Approval Number: ***FAN: IREC 1723*** on 1st September, 2016. You are therefore permitted to begin your investigations.

Note that this approval is for 1 year; it will thus expire on 31st August, 2017. If it is necessary to continue with this research beyond the expiry date, a request for continuation should be made in writing to IREC Secretariat two months prior to the expiry date.

You are required to submit progress report(s) regularly as dictated by your proposal. Furthermore, you must notify the Committee of any proposal change (s) or amendment (s), serious or unexpected outcomes related to the conduct of the study, or study termination for any reason. The Committee expects to receive a final report at the end of the study.

Sincerely,

PROF. E. WERE
CHAIRMAN
INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE

cc CEO - MTRH Dean - SOP Dean - SOM
Principal - CHS Dean - SON Dean - SOD

Consent form

My name is Kaliwai Irene.Dr Wafula is a medical doctor currently pursing Master Degree in psychiatry and a requirement of his course; he is doing a dissertation on **PSYCHIATRY MORBIDITY AMONG PATIENTS WITH FACIAL INJURY AT MOI TEACHING AND REFERRAL HOSPITAL.** He would like to find out if you had any mental illness before the injury or after the injury. He would also like to know about your social demographic information. He would also like to find out what you are being treated for. Your participation in the study will in no way change the treatment plan that your doctors deem fit for you or in any other way prejudice you. However incase you are found to have mental problem that require treatment he will refer you to the appropriate doctor for treatment. This study will no put you at any risk and no extra benefits may accrue to you but the findings of this study may be used to improve mental health care in future and may be published in medical journals and or presented in scientific symposia. Information gathered will be treated with utmost confidentiality, your identity will be protected (Your name will not be used and will be identified with a number only known to me and my immediate assistant. The institutional Research and Ethics Committee of Moi University has approved this research. For any question or clarification please conduct Dr.Cleophas Juma Wafula mobile number 0721930021, email address wafshallie@yahoo.com Moi University,Eldoret,Kenya.

I_____Hereby accept to participate in this study having been explained to and understood the purpose and the procedure involved. I have not been given any inducement to participate in this study

Signature_____Date_____

Withness_____ Date _____