

**PREVALENCE AND PATTERNS OF MENTAL HEALTH DISORDERS AMONG CHILDREN
AND ADOLESCENTS WITH PHYSICAL ILLNESS AT THE OUTPATIENT DEPARTMENT OF
KENYATTA NATIONAL HOSPITAL**

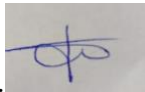
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**Research thesis submitted in partial fulfillment for the award of the degree of Master of Medicine
in Psychiatry**

4/3/2022

Declaration

I declare that this thesis is my original work and has not, to the best of my knowledge, been presented to any other university for the award of a degree.

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List of abbreviations

ACE	Adverse childhood experiences
ADHD	Attention deficit hyperactive disorder
DSM – IV	Diagnostic and Statistical Manual (Mental Disorders, 4th edition)
GAD	Generalized Anxiety Disorder
KNH	Kenyatta National Hospital
MINI-KID	Mini International Neuropsychiatric Interview for Children and Adolescents
NOK	Ndetei-Othieno-Kathuku Scale for Depression and Anxiety
NPV	Negative Predictive Values
POPC	Paediatric Outpatient Clinic
PPV	Positive Predictive Values
SPSS	Statistical Package for Social Sciences
UK	United Kingdom
USA	United States of America
WHO	World Health Organization

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Operational definition of terms and phrases

Legal guardian-a person appointed by will or deed by a parent of the child or by an order of the court to assume parental responsibility for the child upon the death of the child's parent.

Medical practitioner- a physician or doctor or clinical officer

Within the context of screening tests:

		Status of person according to "gold standard"		
		Has the condition	Does not have the condition	
Result from screening test	Positive	a True positive	b False positive	← Row entries for determining positive predictive value
	Negative	c False negative	d True negative	← Row entries for determining negative predictive value

↑ ↑

Column entries
for determining
sensitivity Column entries
for determining
specificity

Sensitivity and specificity:

Sensitivity and **specificity** are statistical measures of the performance of a classification test that are widely used in medicine:

- **Sensitivity** measures the proportion of true positives that are identified correctly (e.g., the proportion of those who truly have some condition (affected) who are correctly identified as having the condition ($a/a+c \times 100$)).

- **Specificity** measures the proportion of true negatives (e.g. the proportion of those who truly do not have the condition (unaffected) who are correctly identified as not having the condition $(d/(c+d) \times 100)$).

ABSTRACT

Background: Mental health problems make a significant contribution to morbidity and mortality among the youth globally. Health care professionals in the general healthcare facilities are strategically placed to detect child and adolescents who present with mental disorders because of the common coexistence between physical and mental health. There is limited data available on the prevalence and patterns of mental disorders among children and adolescents with physical ailments in general outpatient settings in Kenya. This study aims to fill that gap.

Aim: To establish the prevalence and patterns of mental disorders among children and adolescents with physical illness at the outpatient department of Kenyatta National Hospital, as well as exploring associated socio-demographic variables.

Method: This was a cross-sectional study and the pediatric outpatient clinic at Kenyatta National Hospital is the study site. Data was collected from the children and adolescents presenting at the pediatric outpatient clinic. Data was collected using the MINI-KID screening tool for child and adolescent disorders and a researcher designed socio-demographic questionnaire. Data collected was analyzed using Statistical Package for Social Studies version 23 for descriptive statistics, while tests for association were done via chi-square and regression tests.

Results

Those that screened positive for any disorder were 29.6% and those that screened negative were 70.4%. Out of those positive for a mental disorder, most screened positive for Eating and Movement disorders with both at 42.5%. There was a significant association between age and anxiety, Depression, Bipolar mood disorder, PTSD and suicidality. There was an association between education and movement disorders. There was also an association between marital status of guardians with movement disorders.

Conclusion

Nearly a third of the children and adolescents attending the outpatient department at Kenyatta National Hospital screened positive for a mental disorder with the most prevalent being Eating and Movement disorders. There is a need to screen for psychiatric morbidity in the Pediatric outpatient department for purposes of increasing detection rate.

CHAPTER ONE

1.1 Introduction

The exact nature of outpatient health care varies among different countries, which have varying structures of the healthcare system. However, most definitions of outpatient healthcare emphasize direct access to a generalized medical professional who deals with a wide range of conditions. Identifying mental disorders, initiating treatment such as medication and counseling and referring to specialist care providers are the constructs of outpatient mental health services (Borowsky et al., 2000). The management and treatment of a child or adolescent with physical illness presents an opportunity for detection of mental disorders however there is scarcity of data locally on the screening of child and adolescent mental disorders co-occurring with physical illness. This study will seek to explore the prevalence and patterns of mental disorders among children and adolescents with physical illness.

1.2 Background

Youth mental health is a global concern with suicide being the third highest cause of death among the youth and mental disorders, specifically depression, schizophrenia and substance abuse being the leading cause of disability among the youth globally. Globally, 20 percent of children and teenagers suffer from mental health issues. With recognition that 50% of mental health disorders begin by the age of 14, the mental state of children and adolescents has become a global priority (Kessler et al., 2005).

1.2.1 Relationship between mental and physical disorders

Research has shown that the pathways causing co-occurrence of mental and physical disorders are bidirectional (Gianaros & Wager, 2015). Psychological stress is believed to be triggered by mechanisms that ascribe threat-related meaning to events that are beyond our capacity to cope with. Neuro-imaging research further illustrates that these processes originate in the same brain pathways that also control

physiological stress. Consequently, physical illnesses can lead to mental illnesses and mental illnesses can put a person at risk for those physical illnesses.

For instance, it has been determined that people who have chronic medical conditions have a higher risk of developing depression, especially people who suffer from migraines, sinusitis and back pain(Patten, 2001). Depression has been shown to be a risk factor for developing medical conditions that are characterized by pain or inflammation such as arthritis and peptic ulcer disease(Patten et al., 2008). There is a relationship between major depressive disorder and pain, which could be attributed to catastrophizing and magnification of pain. Catastrophizing is a maladaptive form of thinking whereby one has an irrational negative forecast of the future. In this regard, patients who have frequent painful symptoms may catastrophize their pain by having irrational negative thoughts and feelings about their pain.

Similarly, data suggests that children who have anxiety are frequently reported to have ailments such as, respiratory problems, gastrointestinal disorders, frequent headaches(Feldman et al., 2006). Moreover, physical illness may also precipitate or aggravate existing anxiety symptoms, such as intensifying somatic sensations which in turn may cause panic attacks or may provide stimuli for additional stress(Chavira et al., 2008).

1.2.2 Adverse childhood experiences and mental health

Data has shown that traumatic experiences can put one at risk of a number of mental health problems later on in adult life. The specific childhood experiences that have been shown to significantly affect the mental health of individuals consist of three categories namely abuse, neglect and household dysfunction(Chapman et al., 2007). Within these categories, we can further identify specific experiences such as abuse, which can be emotional, sexual and physical, and neglect, which can be emotional and physical. Household dysfunction has been described as being raised by a single parent, witnessing domestic violence, parental substance abuse, and mental issues of a family member.

Adverse childhood experiences, on the other hand, have been directly linked to poor physical health. Studies have shown that, compared to people who did not have adverse childhood experiences, survivors of adverse childhood experiences have higher levels of perceived stress as adults (Briere & Elliott, 2003; Hyman et al., 2007). As a result, they may adopt coping strategies that may adversely affect their health such as substance abuse, over-eating, and engaging in risky sexual behavior in order to deal with the trauma, shame, and hopelessness which can cause health complications over time (Briere, 2002).

1.3 Problem statement

Psychiatric disorders among children and adolescents have been shown to be highly prevalent globally at 20% (Polanczyk et al., 2015). Given that Kenya's child population is estimated to be about 53% of the total population that means that there are approximately 19 million children in Kenya. Since the global prevalence is 20%, that means that approximately 3 million children are affected by mental health disorders in Kenya (Cortina et al., 2012). Some of these children with both mental health and physical disorders are often not diagnosed which leads to these disorders persisting into adult life and instigating further consequences. Some of the consequences include increased likelihood of unemployment, crime and lack of proper housing which leads to dependence on disability support (Patel et al., 2016). Yet, if these conditions are diagnosed early, many of these consequences can be avoided.

Much of the literature exploring the prevalence of mental disorders co-occurring with physical illness has revolved around adults and has also been done in developed countries (Sareen et al., 2005; Kendell, 2001). Moreover, there is a gap in literature in the prevalence of child and adolescent mental disorders among patients with physical illness in the African set up. The aim of this study is to determine the prevalence and patterns of mental disorders among children and adolescents with physical illness at the outpatient department of Kenyatta National Hospital.

CHAPTER TWO: LITERATURE REVIEW

2.1 Child and adolescent mental health

In the USA, Merikangas, et al., (2015) explored prevalence of mental disorders among children and adolescents, and examined disparities in their use of psychiatric care. The study used data from national survey of children's Health. Households with one or more children below 18 years of age were identified, and only one child was picked as the subject while the caregiver served as the survey respondent. Socio-demographic variables assessed in the study included the children's gender, age, race and household income. Caregivers were asked if their children had any mental health disorder including: mood disorders, attention deficit hyperactive disorder (ADHD), autism, conduct disorder learning disorders, cerebral palsy, speech disorders, and Tourette's syndrome. Psychiatry service use was measured by asking caregivers whether a psychiatrist had treated their child. Out of the total 85,637 children and adolescents surveyed, 21% of children had one or more mental disorder.

In Australia, one study compared the prevalence of child and adolescent psychiatric illnesses in 1998 and 2013-14 (Sawyer et al., 2018). Using data from national surveys, the participants were randomly selected and screened for psychiatric illnesses. The disorders assessed were major depression, attention deficit. Hyperactivity Disorder (ADHD), and conduct disorder. It was found that there was minimal decrease in the prevalence of psychiatric illnesses from 1998 (12.5%) and 2013-14 (11%). It is worth noting that there was a consistent trend of higher prevalence in those living in single parent households and well as and low-income households.

In India, Malhotra study established the prevalence of child and adolescent psychiatric disorders (Malhotra & Patra, 2014). Both community based studies and school based studies reporting the prevalence were analyzed after which the total prevalence was calculated. The community prevalence of child and adolescent mental illnesses was 6%, while at school it was 23%.

In South Africa, a systematic review explored the prevalence in healthcare facilities in Western Cape (Kleintjes et al., 2006). DSM IV disorders were reviewed after which a list of disorders was compiled for the study based on clinical and scientific agreement on the disorders that cause the most disability and are most often seen in practice in the Western Cape. The prevalence was 17% with generalized anxiety disorder being the commonest at 11%. Post-traumatic stress disorder and depression were second at 8%.

In Kenya, a study by Ndeti investigated the prevalence of generalized anxiety and major depressive disorder among adolescents (David M. Ndeti et al., 2008). The study used several instruments in different combinations to investigate the different factors of psychological problems in Nairobi public school students. According to the study's results, 12.9 % of the studied population had anxiety, and 80% of the population had social anxiety. Major depression was highly frequent at 25.7% and furthermore, as well as suicide 4%.

Another study in Kenya investigated the morbidity and associated correlates of patients who present at a child and adolescent psychiatric clinic in KNH (Judy W. Kamau et al., 2012). The study area was the specialized psychiatric clinic and the sample size was 166 children and adolescents. The most common psychiatric diagnosis was drug use disorders linked to marijuana use, followed by severe learning disabilities had a prevalence of 10.2% while convulsive disorders were the most common of the physical disorders at 10.8 %, where ADHD and generalized anxiety disorder being the most prevalent.

2.2 Mental disorders in children and adolescents with physical conditions

In Canada, Butler, et al. explored the prevalence of mental disorders in children recently diagnosed with chronic ailments and the impact of comorbidity on the child's quality of life (Butler et al., 2018). It was conducted in two tertiary hospitals and the participants were children with asthma, diabetes, convulsive disorders, food allergy or juvenile arthritis. It was found that 22% of the children had multiple mental disorders with anxiety being the most prevalent disorder. In addition, the study found that there was a

high risk of mental disorders in children with different physical ailments. The study concluded that having both a physical and mental illness tends to have a negative influence on the quality of life.

In the USA, one study examined the incidence of long term pain and psychiatric illness in adolescents and the association between the two (Tegethoff et al., 2015). Data was obtained from a survey of 10,148 adolescents that was carried out from 2001 to 2004. Lifetime psychiatric illnesses were assessed using a structured clinical interview that screens for mental disorders. Adolescents completed a self-reported chronic conditions checklist to assess their lifelong chronic pain. Of the 6,476 participants, 1,600 (25.93%) reported a co-morbidity of chronic pain and a psychiatric illness in their lifetime. Frequent headaches were the most common form of long-term pain associated with psychiatric disorders at 19.49% while there was a strong relationship between chronic back and neck pain and substance use disorder and eating disorders respectively.

In the USA, Chen et al., (2006) examined adolescent mental disorders and adult quality of life by examining longitudinal data from a community study. Indicators of quality of life included physical health, social relationships, psychological well-being, role function, and the environmental context. A single comparison group without any physical condition or mental disability measured mean quality of life score for participants with both physical and mental disorder. The researchers looked into the link between comorbid physical and mental disorders, which were measured at the age of 16, and quality of life, which was measured at an age of 33. The study determined that adolescents with comorbid physical and mental ailments have a substantially poorer quality of life by adulthood.

In New York, one study explored whether teenagers with eating disorders had a higher risk of physical and mental disorders by the time they reach adulthood (Johnson et al., 2002). 717 adolescents and their guardians were interviewed separately after which a screening tool was administered. Algorithms were then formulated to determine if there was an eating disorder. Afterwards, physical ailments during adolescence were then assessed including cardiac disorders, allergies, orthopedic problems, pain disorders, asthma, headaches, epilepsy and diabetes. Eating disorders in adolescents were found to be

substantially associated with co-occurring chronic fatigue (3.81%), migraine or other chronic headaches (3.38%) in adulthood.

In Kenya, one study explored the prevalence of psychiatric morbidity in HIV-positive children and adolescents and the relationship between their immune suppression and mental disorders (Judy W. Kamau et al., 2012). The study site was a pediatric HIV clinic in Nairobi and the participants were 162 children and adolescents who had HIV, as well as their caregivers. It was found that 49% of these children had mental disorders with major depression being the most prevalent at 18%.

2.3 Adverse childhood experiences and mental disorders

In Finland, Ryttilä-Manninen et al., (2014) investigated the prevalence of various traumatic experiences that children face and the relationship they have with mental health disorders among adolescents admitted with mental disorders to a hospital for the first time. It was a comparative study with the reference group selected from the same region as the study group. A standardized tool was used to screen for mental disorders for both the inpatient and comparison groups. The prevalence for mental disorders in the inpatient group were mood disorders at 47.6%, conduct disorders at 23.3%, anxiety at 13.6%, psychotic disorders at 7.8%, eating disorders at 5.8%, and alcohol abuse at 0.5%. Adverse childhood events such as bullying and dysfunctional social relationships were also linked to having a significant psychological condition in the adolescent inpatient population. The majority of participants in the reference group (78.8%) did not meet the requirements for a mental illness.

One review in the UK examined the associations between adverse childhood experiences and reports of auditory hallucinations and paranoia (Bentall et al., 2012). Sexual trauma, physical violence, bullying, and being raised in an institution were among the unique childhood experiences considered and the psychotic symptoms were screened using the Psychosis Screening Questionnaire. Childhood rape was associated with hallucinations after controlling for paranoia, while being raised in institutional care was found to be directly associated with paranoia after controlling for co morbid hallucinations.

Monnat & Chandler, (2015) examined associations between negative childhood events and physical health in adulthood in the USA. Four adult health outcomes were examined which are self-assessment of health, the presence of a physical limitation, diabetes, and history of a heart attack. Questions regarding traumatic childhood experiences, such as divorce, substance use and incarceration, were included in the survey. It was reported that physical violence during childhood was linked to all four areas, while verbal abuse was only linked to functional limitations. Witnessing parental domestic abuse was linked to a higher risk of diabetes diagnosis, while parental divorce was linked to a higher risk of heart attack, net of all other controls.

In Nigeria, Oladeji et al., (2010) investigated the previously documented correlation between traumatic childhood experiences and psychiatric problems in later life. A national survey was used to pick respondents for face-to-face interviews in the report. They were then screened for family-related traumatic childhood experiences and lifelong mental health conditions. It was found that most of the respondents had experienced a family related traumatic event before they were 16 years old. Furthermore, presence of mental illness among parents was significantly associated with a higher risk for developing mood disorders.

In Kenya, one study explored the prevalence of traumatic childhood experiences in people diagnosed with addiction at a referral psychiatric hospital (Kiburi et al., 2018). An initial mental state test was conducted to exclude any active psychiatric disorders. Information on socio demographic factors, adverse childhood events, and substance abuse was obtained. Alcohol was the most widely used drug, as stated by 82.1 percent of the participants. 93 percent of respondents reported at least one negative childhood incident with the most prevalent one being the death of a parent, which was found in 50% of the respondents. Emotional abuse, positive family history of with a mental illness, physical abuse, and physical neglect were all substantially correlated with current addiction. Notably, emotional abuse was found to significantly be associated with tobacco use in adulthood.

2.4 Significance and Rationale

There is a dearth of data on the patterns of mental disorders in children and adolescents with physical illness in Kenya. Studies done, mostly in the west have shown that child and adolescent mental health disorders to be highly prevalent and that they are often detected later on in life. This has been demonstrated to lead to poor outcomes. This current study therefore established the prevalence and patterns of mental disorders in children and adolescents with physical illness at Kenyatta National Hospital and the associated socio-demographic factors.

When consultations of patients routinely attending health care facilities does not include at least a general discussion about mental health disorder issues with clinicians, this may lead to missed opportunities. Patients presenting for routine care should be counseled, screened and where necessary referred for specialized care. This is the Kenya government policy (Universal Health 2015 – 2030) of integrating mental health services in routine services at all levels and especially in general health care facilities. To expand the opportunities to provide mental health services to patients during regular visits to health care facilities, interventions are required at the patient, hospital and community levels.

The public health care system in Africa, as well as Kenya, is founded on universal primary care principles, as it is in many other parts of the world. This means a comprehensive service, which involves the incorporation of non-specialist facilities with programs such as mental health services. According to the World Health Organization's global report, there is significant evidence that Kenya is struggling to adopt this program and is not seeing the anticipated results (World Health Organization & The World Bank, 2015). One of the contributing factors to this is the missed opportunities of detecting mental health problems among patients who present themselves to health facilities for other health problems. Better coverage and more cost-effective service delivery may be accomplished if the need for specialized mental health services were recognized and addressed during visits to healthcare facilities.

2.5 Theoretical framework

This study used the bidirectional model. According to research on the aetiological theories, the bidirectional model hypothesizes that physical illness and psychiatric disorders may increase vulnerability for each other (Duric et al., 2016). Psychological stress is thought to arise from physiological processes that attach threat to experiences that exceed our coping ability. Neuro-imaging research further demonstrates that these processes involved in psychological stress originate in the same pathways that are involved in physical or systemic stress. Furthermore, the physical stress associated with systemic illness can lead to activation of immune response system, releasing inflammatory mediators that are potentially key contributors to the development of co morbid mental illness. Therefore, each serves to worsen and/or sustain the other in a reciprocal fashion, with a positive feedback loop or feed forward cycle intertwining mental illness and physical illness. This study sought to determine the prevalence of mental disorders in children and adolescents who have physical illness.

2.6. Research questions

1. What is the prevalence and patterns of mental disorders among children and adolescents with physical illness at the outpatient department of Kenyatta National Hospital?
2. What socio-demographic correlates are present among children and adolescents with both mental and physical symptoms at the outpatient department of Kenyatta National Hospital?

2.7 Objectives

2.7.1 Broad objective:

To establish the prevalence and patterns of mental disorders among children and adolescents with physical illness at the outpatient department of Kenyatta National Hospital.

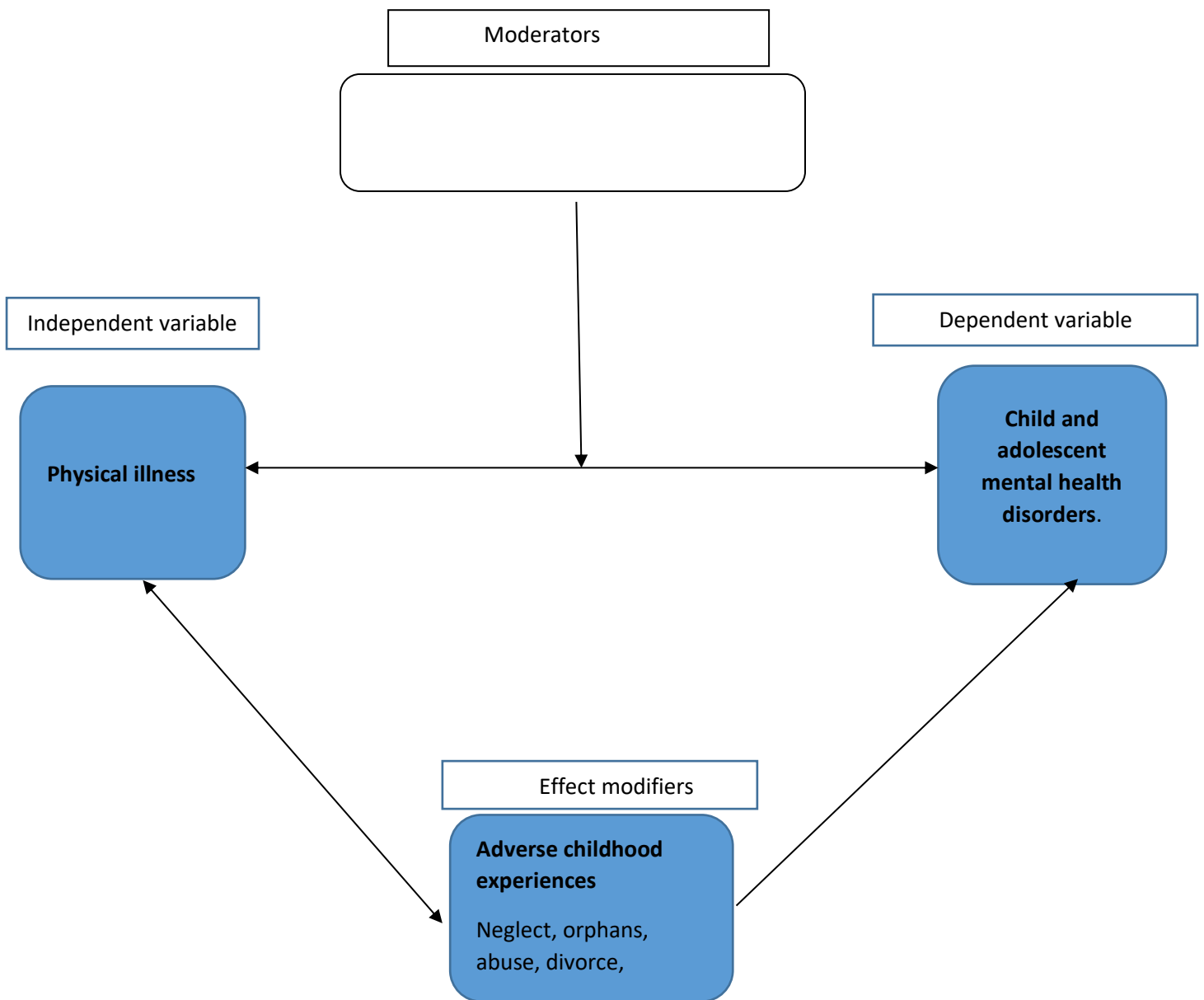
2.7.2 Specific objectives:

1. To determine the prevalence of mental disorders among children and adolescents with physical illness at the outpatient department of Kenyatta National Hospital.

2. To describe the most commonly occurring mental disorders co-occurring with physical illness among children and adolescents in the outpatient department of Kenyatta National Hospital
3. To describe the socio-demographic correlates in patients with co-occurring mental disorders and physical illness

2.8 Conceptual framework

Figure 2.1 Conceptual framework



2.9 Instruments in use

There are two instruments used in the study. The first was the socio-demographic questionnaire that was researcher designed and provided information such as age, gender, marital status of parents, current housing status, education level of parents and employment status of parents. Through a researcher-guided interview, the questions were directed to the parent or legal guardian and filled by the researcher.

The second tool was the Mini International Neuropsychiatric Interview for Children and Adolescents (MINI-KID, which is an interview used to screen for mental disorders which include ADHD, depression, anxiety, suicide, movement disorders, conduct disorders, bipolar disorder and eating disorders. MINI-KID is a children's version of the Mini-International Neuropsychiatric Interview (MINI) and uses two to four screening questions for each disorder. Through a researcher-guided interview, the questions were directed to the parent or legal guardian and filled by the researcher.

The MINI-KID disorder classifications yielded estimates of test–retest reliability and validity comparable to other standardized diagnostic interviews in both general population and clinic samples. These findings, as well as to the brevity and ease of use make the MINI-KID a favorable tool for use in this current study.

CHAPTER THREE: Methodology

3.1 Study Design

This was a cross-sectional descriptive study. Data was collected at a particular point in time from a study population comprising of children and adolescents presenting at the outpatient department.

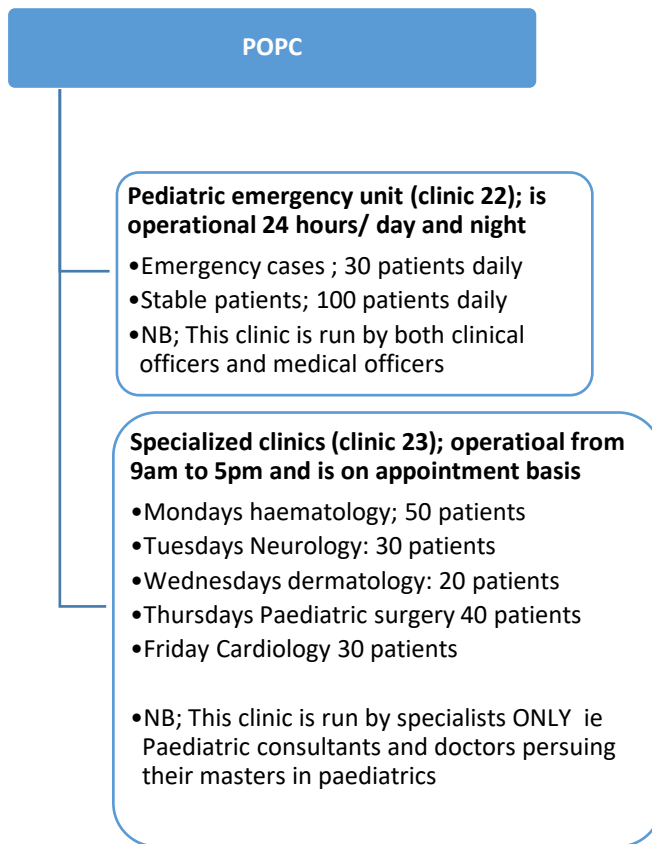
3.2 Study Area

The study was carried out in Kenyatta National Hospital (KNH). This is the largest referral tertiary hospital in Kenya, receiving patients from across the country. It is situated in Nairobi County, five kilometers from the city Centre. It currently has a bed capacity of 1,800 beds. It offers both outpatient and inpatient departments. KNH has 50 wards, 22out-patient clinics, 24 theaters and an Accident & Emergency Department. Respondents were sampled from pediatric outpatient clinic (POPC).

3.3 Study Population

The POPC is divided into two, the general outpatient clinic and the specialist clinics. The general outpatient clinic is a 24-hour clinic that operates every day of the week and attends to walk in patients who are either stable or emergency cases. The specialist clinics operate from Monday to Friday, from 9am to 5pm and are on appointment basis. The specialist clinics are organized as follows, Monday is the haematology clinic, Tuesday is neurology, Wednesday is dermatology, Thursday is paediatric surgery and Friday is the cardiology clinic. Both the general and specialist clinics contributed to the study population in this study.

Figure 3.1; KNH Paediatric Outpatient Clinic



3.3.1 Inclusion criteria

- Patients aged 6-17, which is in line with the literature review of the validity testing of the MINI-KID.
- Availability of parent or legal guardian to give consent
- Assent
- Patients presenting with a physical illness and specifically, physical illness that does not pose an immediate threat to life. This was guided by a question in the questionnaire that assessed the severity of illness and this question was informed by the triage assessment. Severely sick patients are coded blue while non-emergency cases are coded red and green. The study included the red and green coded patients only.

3.3.2 Exclusion criteria

- Patients who have severe illness and are unable to respond objectively. For the purpose of this study, severe illness is defined as a condition that carries a high risk of mortality and/or is burdensome in symptoms, treatments, or caregiver stress (Kelley, 2014). There was a question in the questionnaire to assess the severity of illness. The question was informed by the triage assessment of the patient. Severely sick patients are coded blue, these patients were excluded.
- Patients who have an existing mental health disorder.

3.4 Sample Size Determination

The sample for this study is determined by using a single population proportion formula with finite population correction with 95% confidence interval (CI) (Naing et al., 2006). The proportion of psychiatric illnesses in primary settings in Kenya is about $p = 20\%$, assumed from the majority of the literature reviewed (Kamau et al., 2017; Kamau et al., 2012) a 5% level of significance and precision of 5% delivers 245, number of children and adolescents to be recruited in the study as indicated below.

n = sample size required;

Z - Level of confidence, i.e. the standard normal deviation at 95% CI, (1.96)

p - is expected prevalence (obtained from literature reviews, 0.20);

d - is precision (margin of error that was accepted – 5% or 0.05).

$$n = Z^2 p(1-p)/d^2$$

$$= (1.96)^2 (0.2)(1-0.2)/.05^2$$

$$= (3.8416) (0.16/0.0025)$$

$$= 245$$

Thus, because the prevalence of mental health problems is about 20 percent in children and adolescents in the population of children and adolescents attending primary health care in sub Saharan Africa, 245 children and adolescent out-patients had to be recruited for this research study.

3.5 Sampling technique

Stratified sampling technique was used to group the population into homogenous subsets called strata, then randomly selecting respondents in the same proportion to the population from each of the strata. The Paediatric Outpatient Clinic (POPC) was divided into two strata, that is, the general POPC and the Paediatric specialist clinics. The general POPC was further divided into two substrata, which is the emergency cases and the stable patients. The specialist clinics were further divided into five substrata which are the hematology, neurology, dermatology, paediatric surgery and cardiology clinics. Next, proportionate stratified sampling was used, where a sample from each stratum, was taken in proportion to the stratum size, compared to the population.

Table 3.1: Proportionate stratified sampling

Strata	Substrata	Number of patients seen per day	Percentage	Number of patients in proportion to sample size of 245
General outpatient	Emergency patients	30	10%	25
	Stable patients	100	33.3%	81
Specialist clinics	Haematology	50	16.7%	40
	Neurology	30	10%	25
	Dermatology	20	6.7%	16
	Paediatric Surgery	40	13.3%	33
	Cardiology	30	10%	25
Total		300	100%	245

3.6 Recruitment and data collection

Data was collected on all the days of the week until the sample size of 245 was achieved. The principal investigator started with the general outpatient clinics first and then proceed to the specialty clinics.

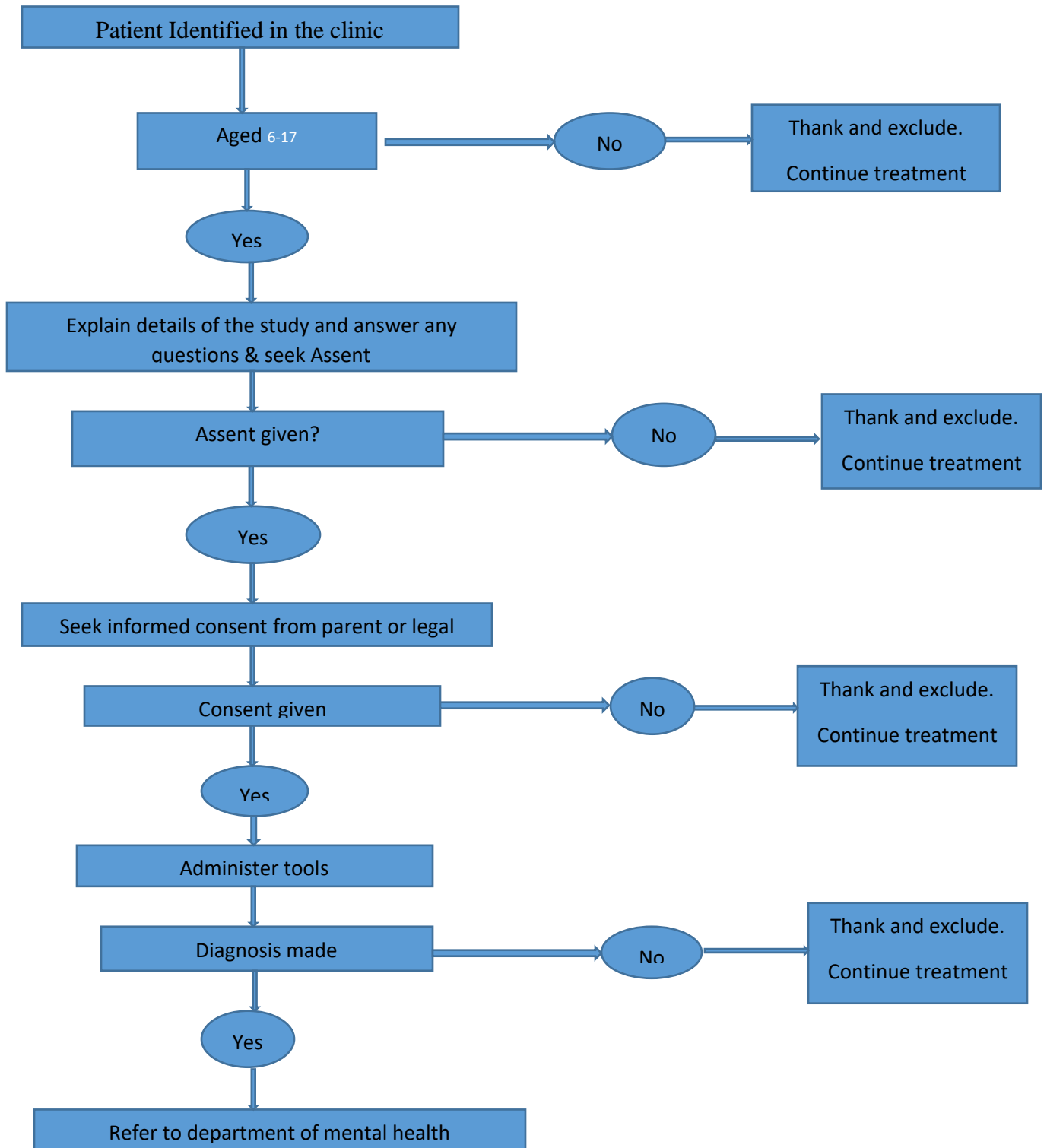
The principle investigator selected patients who meet the criteria to the research desk of the study which was also based in the outpatient clinics. The patients were only referred to the study desk after they had been attended to by the clinicians for the illness that brought them to the hospital in the first place. The referred patients were received at the study desk by the study principal investigator. The study was explained to the parent or legal guardian and/or the patient and they were asked for permission to be participants in the study. Those who assented to take part in the study were recruited and written consent was obtained from the parent or legal guardian. After consent was obtained, through a researcher guided interview, the questions were directed to the parent or legal guardian and filled by the researcher.

Estimated duration for administering the questionnaire was twenty minutes.

The questionnaire consists of two sections. Section one includes the socio-demographic information; such as age, gender, family history, marital status of parents, current housing status, education level of parents, employment status of parents and family history of mental health problems. Section two consists of the screening instrument, the MINI-KID. The principal investigator reviewed completed questionnaires on the spot and at the end of the session for prompt correction of any incorrect entries. A diagnostic algorithm of the MINI-KID modified to MINI-KID – A, was followed strictly in assigning diagnoses as appropriately to the responses. The data was coded and put into a database using SPSS statistical software version 26.0.

2.7 Recruitment and Data Collection Flow Chart

Figure 3.2



3.8 Study Instruments:

3.8.1 Socio-demographic questionnaire

This included family history, marital status of parents, current housing status, education level of parents, employment status of parents, and family history of mental health problems

3.8.2 MINI-KID screening tool

The MINI-KID screening tool is divided into diagnostic modules and each module comprises of screening questions. All questions are answered in a “yes or no” format.

The MINI-KID screening questions have been found to provide additional details when compared to other structured diagnostic interviews. Moreover, the MINI-KID screening questions can reveal major concerns early in the child and adolescent evaluation process (Högberg et al., 2019).

Some of the questions are not appropriate for younger children, such as questions related to drugs or alcohol, obsessions relating to eating and sexual disorders. These questions include question number 19 and number 20. These questions with such themes were only targeted to the appropriate age group, which is adolescents, rather than the whole participant population. For the purposes of this study, an adolescent is defined as people aged between 10 and 19 years of age (UNICEF 2011)

3.9 Data Management and Analysis

A diagnostic algorithm of the questionnaire was followed to assign an appropriate diagnosis to the responses provided by the children and adolescent out-patients. After data collection was completed, the data was scrutinized, edited, and analyzed by using SPSS (latest version). Descriptive statistics were used to describe the profile of the respondents. The chi-square tests were performed and used as needed to assess the statistical significance of differences in participant responses. A significant value of 0.05 was considered significant and presented.

For the baseline characteristics of the respondents interviewed, percentages, means, and standard deviations were computed. There was a focus on univariate frequency tables and bivariate cross

tabulations that revealed significant relationships between variables. The relationships between the socio-demographic characteristics and the presence of mental health problems was investigated through bivariate analysis including the use of regression-based analyses.

3.10 Quality assurance procedure

One data clerk who has a certificate in data analysis was adequately trained on the procedure of handling data prior to the study. This involved piloting the data collection tools. The principal investigator reviewed questionnaires that filled to ensure consistent and reliable information. Questionnaires were kept under lock and key and the computer used to enter and analyze data was password protected.

3.11 Ethical Considerations

1. Approval was sought from the Kenyatta National Hospital – University of Nairobi Ethics and Research Committee (KNH – UON ERC)
2. Informed consent was availed for signing by the parent or legal guardian for those willing to participate in the study
3. Confidentiality was observed by ensuring that no names or patient numbers were used during the study. Serial numbers were used instead.

3.12 Potential benefits of the study

The data from this study may help clinicians and patients in better understanding of the factors contributing to missed diagnosis of child and adolescent mental disorders. This would lead to increased detection rate of child and adolescent mental disorders.

3.15 Study Duration

The study took three (3) weeks for data collection. Each day, a minimum of fifteen (15) subjects were recruited in the study resulting in recruiting 75 subjects per week. 3 weeks were needed to recruit 245

patients being the required number of subjects in the study sample. It took another one (1) week to analyze the MINI-KID giving the study a total of 4 weeks to complete.

CHAPTER 4: RESULTS

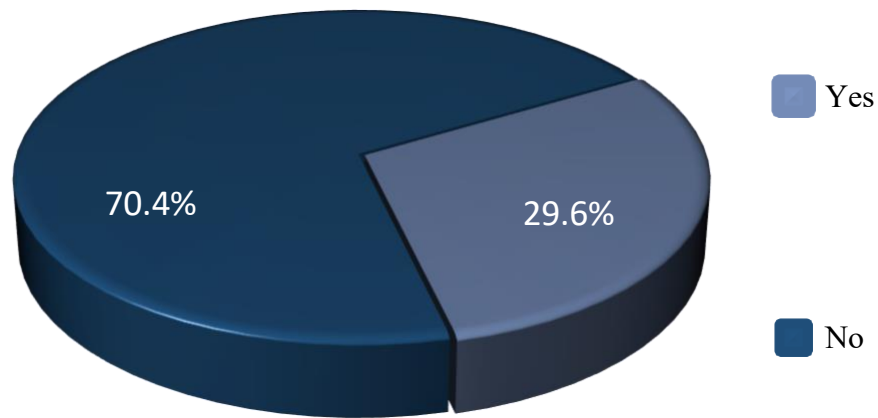
4.1 Response rate

The study recruited 248 respondents who were willing to participate and consented to the study. The sample size of 245 was already achieved but an additional 3 were intrigued and interested in the study. Out of 248 questionnaires, 247 were deemed fit for analysis. (99.6%)

4.2 Prevalence

Those that screened positive for any disorder were N-73, which was 29.6% and those that screened negative were N-174 coming to 70.4%.

Figure 4.1: Prevalence of child and adolescent mental disorders



Further elaboration found that most respondents screened positive for Eating and Movement disorders with both having N=31.

The least positively responded to questions were those related to Substance Use Disorder, Psychosis and OCD with N=0, N=1 and N=1 respectively. Distribution is demonstrated in Table 4.1.

Table 4.1: Distribution of the positively screened disorders

Diagnosis	Positive (N-73)	% of Positive (N-73))% of Total (N-247)
Eating	31	42.5%	12.6
Movement	31	42.5%	12.6
ADHD	20	27.4%	8.1
Conduct	17	23.3%	6.9
Anxiety	7	9.6%	2.8
Depressive	6	8.2%	2.4
Bipolar	4	5.5%	1.6
PTSD	4	5.5%	1.6
Suicidality	3	4.1%	1.2
OCD	1	1.4%	0.4
Psychosis	1	1.4%	0.4
SUD	0	0	0

4.3 Descriptive statistics

As per our sample, the most popular age group visiting the outpatient clinic was those between ages of 6-9. Our youngest participant was 6 years with the oldest being 15 years of age. Teenagers formed the smallest population at N-28 (11.3%).

There were overall more males than females at 51.4% versus 48.6% respectively.

Most of the participants were in the lower primary level of education that is Grade 1 to 5. Other groups being Pre-primary that consisted of those yet to join school, pre-primary 1 &2 and the upper primary participants falling in grade 5 to 8.

Most of the participants' guardians were married with the least being widowed at 75.3% and 5.3% respectively. Most guardians were primarily in business ventures with the least being in informal employment. Most of the participants came from a family that had permanent housing.

Additionally, only 2.4% and 21.5% of the participants had a family history of a Mental Illness and Drug or alcohol use respectively. Of the participants, none had a pre-existing mental illness.

Table 4.2: Socio-demographic variables of study participants

SOCIODEMOGRAPHICS	CATEGORIES	N	%
Age	Children (6-9)	129	52.2%
	Pre-teens (10-12)	90	36.4%

	Teenagers (13-15)	28	11.3%
Sex	Male	127	51.4%
	Female	120	48.6%
Education level	Pre-primary	32	13.0%
	Lower Primary	119	48.2%
	Upper Primary	96	38.9%
Guardian's marital status	Single	30	12.1%
	Married	186	75.3%
	Separated/Divorced	18	7.3%
	Widowed	13	5.3%
Guardian's occupation	Business ventures	121	49.0%
	Formal employment	42	17.0%
	Informal employment	20	8.1%
	Unemployed	64	25.9%
Type of housing	Permanent	209	84.6%
	Semi-permanent	29	11.7%

	Temporary	9	3.6%
History of family MI	No	241	97.6%
	Yes	6	2.4%
History of family DU	No	194	78.5%
	Yes	53	21.5%

4.4 Inferential statistics

As part of the objectives, we tested whether there was a correlation between our sociodemographic variables and screening positive for a mental illness on the MINI-KID questionnaire.

Within the age groups, the group with the higher prevalence were the pre-teens at 40% compared to 26.5% and 39.2% from the children and the teenagers. Females had generally a higher prevalence of screening positive 34.1% compared to the males at 25.2%.

Participants in pre-primary had a higher likelihood of screening positive 37.5% compared to those in Lower primary and Upper primary at 26.9% and 30.2% respectively.

However, there was no significant positive correlation between all the five variables and screening positive to a question on the MINI-KID.

Table 4.3: Correlation between Sociodemographic variables and screening positive

SOCIODEMOGRAPHICS	CATEGORIES	No	Yes	Chi-square	Significance
Age	Children (6-9)	94	34	2.012	0.064
	Pre-teens (10-12)	62	28		
	Teenagers (13-15)	17	11		
Sex	Male	95	32	2.384	0.080
	Female	79	41		
Education level	Pre-primary	20	12	1.396	0.498
	Lower Primary	87	32		
	Upper Primary	67	29		
Parental marital status	Single	23	7	1.012	0.794
	Married	127	59		
	Separated/Divorced	16	2		
	Widowed	8	5		
Parent's occupation	Business ventures	84	37	6.090	0.057
	Formal employment	32	10		

Informal	13	7
employment	45	19
Unemployed		

We then screened the individual disorders from the MINI-KID against the socio-demographic variables. The results showed a positive correlation between age and anxiety, Depression, Bipolar mood disorder, PTSD and suicidality.

There was no correlation between sex and the disorders.

Education was positively correlated with movement disorders with a Chi-square value of 8.937 and a significance level of 0.011.

Guardian's marital status was positively correlated with Movement, PTSD and Suicidality with Chi-square values of 11.503, 11.079 and 12.096 and significant levels of $p=0.021$, $p=0.026$ and $p=0.017$ respectively.

Table 4.4: Correlation between sociodemographic variables and various disorders

SDV	Eating	MVT	ADHD	Conduct	Anxiety	Dep	BMD	PTSD	Suicidal	OCD	Psychosis
Age	1.298	0.710	1.319	0.995	7.209	9.614	7.690	16.806	9.796	1.752	0.918
	0.532	0.701	0.517	0.612	0.027	0.008	0.021	0.004	0.007	0.363	0.632
Sex	0.555	1.276	0.359	0.766	3.976	0.805	0.003	4.303	0.398	0.766	1.063
	0.290	0.174	0.357	0.266	0.057	0.315	0.667	0.054	0.479	0.455	0.486
Education	0.381	8.937	0.963	1.025	1.083	0.997	2.346	2.346	1.136	1.080	6.746
	0.817	0.011	0.618	0.599	0.582	0.607	0.309	0.263	0.567	0.583	0.034
Marital status	4.401	11.503	2.829	7.622	5.012	4.914	8.343	11.079	12.096	0.329	0.329
	0.354	0.021	0.587	0.106	0.286	0.505	0.080	0.026	0.017	0.988	0.966
Occupation	1.520	4.020	5.863	0.621	2.705	2.198	2.128	1.932	3.886	0.621	2.871
	0.706	0.090	0.139	0.897	0.228	0.380	0.513	0.433	0.250	0.879	0.438

Further, Multivariate analysis was done to determine the relationship between the socio-demographic groups and the disorders.

Firstly, students in Pre primary were more likely than their counterparts in upper primary to present with movement disorders with a significance level of $p=0.021$ which was statistically significant.

Those who came from families where the guardian was widowed, had a higher probability of presenting with movement disorders compared to those whose parents were married (p=0.045). This was statistically significant.

Table 4.5: Select socio-demographic variables and movement disorders

Movement		No	Yes	95% C.I		Significance
				L.L	UL	
Education	Pre	23	9	0.071	0.333	0.021*
	Lower	109	10	0.255	1.743	0.327
	Upper	84	12	.	.	.
Marital status	Single	28	2	0.585	1.260	0.302
	Sep/Divorced	18	0	0.289	4.296	0.989
	Widowed	8	5	1.084	1.769	0.045**
	Married	162	24	.	.	.

For those who screened positive for depression, there was a statistically significant difference between the younger age group compared to the teens. The children were 0.43 to 5.04 times less likely than the teenagers to present with symptoms of depression. This was statistically significant as well p=0.023.

Table 4.6: Depression and select sociodemographic variable

MDD		No	Yes	95% Confidence interval		Significance
				Lower limit	Upper limit	
Age	Children	128	1	0.369	0.701	0.023*
	Pre-teens	88	2	0.045	1.745	0.072
	Teenagers	25	3	.	.	.

When it comes to anxiety disorders, children again were less likely than the teenagers to screen positive (p=0.028).

Table 4.7: Anxiety and select sociodemographic variable

Anxiety		No	Yes	95% Confidence interval		Significance
				Lower limit	Upper limit	
Age	Children	127	2	0.098	0.654	0.028*
	Pre-teens	88	2	0.247	1.638	0.082
	Teenagers	25	3	.	.	.

For suicidal tendencies there were no significant differences between the age groups and marital status.

Table 4.8: Suicidality and select sociodemographic variables

Suicidality		Yes	No	95% C.I		Significance
				Lower limit	Upper limit	
Age	Children	129	0	0.869	3.867	0.996
	Pre-teens	89	1	0.654	1.092	0.173
	Teenagers	26	2	.	.	.
Marital status	Single	29	1	0.269	1.263	0.998
	Sep/Divorced	17	1	0.262	1.274	0.999
	Widowed	13	0	0.299	1.77	0.054
	Married	185	1	.	.	.

Bipolar disorders had no significant differences between those who screened positive in the different age-groups.

Table 4.9: Bipolar and select sociodemographic variable

Bipolar		Yes	No	95% Confidence interval		Significance
				Lower limit	Upper limit	
Age	Children	129	0	0.436	2.476	0.998
	Pre-teens	88	2	0.051	1.103	0.234
	Teenagers	26	2	.	.	.

For PTSD, there was no difference in the groups when it comes to the guardian’s marital status but there was a statistical difference in the age groups. Participants who were in their pre-teens were less likely than the teenagers to screen positive for PTSD. This had a $p=0.041$, which was statistically significant within our 95% confidence interval.

Table 4.9: PTSD and select sociodemographic variable

PTSD		Yes	No	95% Confidence interval		Significance
				Lower limit	Upper limit	
Age	Children	129	0	0.974	3.982	0.998
	Pre-teens	89	1	1.133	1.187	0.041*
	Teenagers	25	3	.	.	.

Marital status	Single	28	2	0.102	4.001	0.998
	Sep/Divorced	18	0	0.870	1.262	0.091
	Widowed	8	5	0.134	1.648	0.160
	Married	162	24	.	.	.

Overall from our results we can conclude that we had more respondents who were between the ages of 6-9y, males, in lower primary level of education, having a guardian who was married, living in a permanent house and predominantly guardians who were in business ventures.

Bivariate analysis showed a statistical correlation between age and anxiety, depression, PTSD, Bipolar and suicidality. There was also a correlation between marital status and PTSD, Movement disorders and suicidality. There was another correlation between education and movement disorders.

Multivariate analysis concluded that there was a significant relation between age and depression, anxiety and PTSD; marital status and movement disorders and education and movement disorders.

CHAPTER 5: DISCUSSION

5.1 Prevalence and patterns of mental disorders

This study found that the prevalence of mental disorders among children and adolescents with physical illness was 29.6%. In Nigeria, the prevalence of psychiatric morbidity in primary care was lower than the prevalence in this study at 11.4% (Tunde-Ayinmode, et al. 2012). Of note is that the study in Nigeria used the Child Behavior Questionnaire while the current study used the MINI-KID questionnaire. In addition, the sample size in the Nigerian study was smaller (157) compared to the current study (245). In Kenya, (Ndetei, et al. 2016) explored the prevalence of mental disorders among primary school children and found a prevalence of 37.7%, which is higher than the prevalence in our current study. Somatic complaints were the most prevalent followed by affective disorders, which differs from the current study. In the United States, two studies explored the prevalence of mental disorders in outpatient clinics. One study found a prevalence of 22% (Butler et al., 2018) and another similar study, indicated a prevalence of 25.93% (Tegethoff et al., 2015) which are both similar to the prevalence of the current study.

While exploring the prevalence of each condition, some differences as well as comparisons to other studies were found. In a systematic review of global prevalence of eating disorders (Qian, et al. 2022), the pooled lifetime and 12-month prevalence of eating disorders were 0.91% (95% CI, 0.48–1.71) and 0.43% (95% CI, 0.18–0.78), respectively which is lower than the current study (12.6%). In contrast to the meta-analysis, which evaluated the general population, this current study evaluated a sick population which could imply that eating disorders are more prevalent in a sick population. A systematic review and meta-analyses of 50 studies, incorporating 186,056 children and adolescents from 35 countries found a prevalence of conduct disorder of 8% (Mohammadi, et al. 2021), which was similar to the current study (6.9%). In another meta-analysis of ADHD, 102 studies comprising 171,756 subjects from all world regions were included. The ADHD/HD worldwide-pooled prevalence was 5.29%, which is similar to the current study (8%).

The current study found that the prevalence of substance use in our sample aged 6-14 years to be 0%. This is consistent with the findings of a study that explored the Prevalence And Patterns Of Early Drug Abuse in Nairobi, which found that the mean age of onset to drug use was 16 years; specifically 16 years for cannabis, 16.5 years for tobacco, 16.8 years for alcohol (Kisilu, et al. 2019). We can infer from the results in this study as well as previous studies that prevalence of substance use disorders in children and adolescents increases with age. A systematic review of substance use among adolescents in Sub-Saharan Africa (Adebanke, Ogundipe and Adeloye 2018) compared the mean age of onset to drug use as follows; Nigeria 14 years, South Africa 14 years & Ethiopia 13 years. We can therefore conclude that young adolescents in Kenya are exposed to substances at an older age when compared to their peers in other parts of Africa.

Moreover, for mood disorders, this study found a prevalence of 7% (anxiety), 6% (depression) and 4% (bipolar mood disorder). A study in South Africa (Kleintjes, et al. 2006), found a prevalence of 2% (anxiety), 5% (depression) and 1% (bipolar) which are all lower than the prevalence in this study. Key contrasts between the current study and the South African study is that the former was conducted in a hospital set up among subjects who had physical illness, while the latter was done in the general population. We can therefore infer that physical illness contributes to a higher prevalence of mood disorders.

The participants in this study had a wide range of conditions including neurological (N=25; 10%), hematological (N=40; 16.7%) and cardiac conditions (N=25; 10%) which is in contrast to previous studies done in this set up, which have measured psychiatric morbidity in HIV. In Nairobi, Kamau, et al. 2012, found that the prevalence of psychiatric morbidity among children/adolescents with HIV infection was 48.8% (95% CI 40.8, 56.7) with n=162 with major depression most prevalent at 18%. 25% had more than one mental disorder and the overall prevalence of psychiatric morbidity in HIV-infected children was more than the general population. In Eldoret, the prevalence of psychiatric morbidity among HIV infected

children and adolescents was found to be 57.5% and the most prevalent disorders were anxiety 53.8%, suicidality 10.4% and ADHD 10%. (Njuguna 2019).

5.2 Sociodemographic correlates

Similarly, where patient factors were explored, this study found a significant association between age and anxiety, Depression, Bipolar Mood Disorder, PTSD and Suicidality where older children were more likely to experience these disorders. This compares to a review of epidemiological data that demonstrated that prevalence rates of anxiety increase with age among children and adolescents (Beesdo, Knappe and Pine 2009). This was similar to a study in the United States that found the prevalence of depression to be increasing in successive age in children and adolescents (Son, 2000). This was also similar to studies such as one study done in Norway, which found that adolescents were more likely to have suicidal ideation than younger children (Groholt, et al. 1998).

In the current study, those who came from families where the guardian was widowed, had a higher probability of presenting with psychiatric morbidity, which is consistent with studies that have demonstrated that loss of a parent is significantly associated with childhood mental disorders. For instance, (Tyrka, et al. 2008) explored whether childhood parental death and separation are linked to lifetime depressive and anxiety disorders. Participants were 105 individuals from the community, including a group with separation from a parent, a group with childhood parental death, and a matched control group whose parents remained married and living together. Participants completed interviews and questionnaires assessing symptoms of anxiety and depression, family psychiatric history, childhood maltreatment, and childhood parental relationships. Participants with separation and those with parental death were significantly more likely than controls to report the subsequent onset of symptoms of a depressive or anxiety disorder.

In this study, younger children at lower level of education were significantly correlated with movement disorders, which is comparable to a study of the prevalence of tic disorders in the USA (Scahill et al., 2014).

A meta-analysis of the epidemiology of tic disorders also found that younger children are more likely to have tic disorders than older children are (Knight, et al. 2012).

It would be worthwhile to analyze the association between physical illness and mental disorders among children and adolescents in future studies to tie in with the findings of the study. Moreover, a follow up study of how many children who screened positive are eventually referred to the mental health department for further analysis and treatment is recommended. In addition, an audit of knowledge, attitudes and practices of practitioners attending to children and adolescents at the outpatient department of KNH may be useful in improving the screening process and detection rate of these disorders.

CHAPTER 6: CONCLUSION

6.1 Conclusion

1. In conclusion, this study found that nearly a third of the children and adolescents attending the outpatient department at Kenyatta National Hospital screened positive for a mental disorder.
2. The common mental disorders were eating disorders, movement disorders, ADHD and conduct disorders.
3. Of those patients who screened positive for mental disorders, most of them had multimorbidity (more than one mental disorder).

6.2 Recommendations

1. The Paediatric Outpatient Department should put in place a policy of screening for psychiatric morbidity in the outpatient department for purposes of increasing detection rate. Early detection has shown improved quality of life and outcomes of mental disorders in childhood (Merikangas et al., 2015).
2. A knowledge, attitudes and practices study among clinicians in the outpatient department may be useful in assessing the expertise in detecting psychiatric disorders and to assess the gaps in patient management.
3. Topics on screening of mental disorders should be incorporated in trainings and continuous medical education in the Paediatric department to sensitize and equip them with knowledge on mental disorders among children and adolescents.

6.3 Study limitations

1. This is a hospital set up study so results cannot be generalized to the general population.

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2. The study could have been improved if there was a record of the specific medical illnesses each participant was presenting with. This would be beneficial in determining an association between specific medical illnesses with specific psychiatric disorders.

STUDY TIME FRAME

Number	Activity	Estimated Time
1.	Development of Proposal and presentation	July to October 2019
2.	Proposal Submission for ethical approval	March 2020
3.	Data Collection	August-September 2021
4.	Data Analysis	October 2021-December 2021
5.	Thesis Writing	January 2022- February 2022
6.	Thesis Submission	March 2022

STUDY BUDGET

Category	Remarks	Units	Unit Cost	Total (Ksh.)
Proposal Development	Printing drafts	1,000 pages	5	5,000
	Proposal copies	7 copies	1,000	7,000
Data Collection	Stationery pack (Pens, paper)	400	50	20,000
	Transport	200	30 (days)	6,000
	Airtime & data	100	30	3,000

Data Entry	Data Clerk	1	4,000	4,000
Data Analysis	Statistician	1	30,000	30,000
Thesis Write up	Printing drafts	1000 pages	5	5,000
	Printing Thesis	10 copies	1500	15,000
Contingency fund				5,000
Total				100,000

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APPENDICES

Appendix 1: Parental consent explanation Document (English Version)

Title: Prevalence and pattern of child and adolescent mental disorders in Kenyatta National Hospital.

Participant Study Identification Number

Date

Dear Sir/Madam,

Introduction

My name is Dr. Caroline Vundi, a postgraduate student in psychiatry at the University of Nairobi.

In collaboration with the University of Nairobi, we are doing a study on the prevalence and pattern of mental disorders among children and adolescents with physical illness at the outpatient department of Kenyatta National Hospital. To achieve this, we need 245 patients to help us fill questionnaires about themselves, which will help us meet our objective.

To this end, we kindly request for parent or legal guardian's participation in the study.

Requirements

For one to participate in the study you need to:

1. Be aged 6-17 years.
2. Have available parent or legal guardian to sign informed consent form.

Procedure

If you agree to participate in the study, you will

1. Be asked for verbal assent and parent or legal guardian to sign a consent form expressing voluntary participation.
2. Be asked questions that relate to:
 - i) socio-demographic information such as age, gender, Level of education and others
 - ii) use of any substance of abuse such as alcohol, cannabis, cigarettes, Khat, and others
 - iii) Traumatic experiences including abuse and neglect

This will be in form of a questionnaire that will take 20 minutes to complete

Benefits:

There are no direct benefits for participating in this study.

However, results from this study can help patients and clinicians to better understand the factors affecting detection of child and adolescent mental disorders.

This will help in improving the management of patients with these disorders.

Risks:

You might feel embarrassed or uncomfortable as you give information about substance use disorder and psychiatric illness, which are potentially sensitive topics.

In case there is psychological disturbance, you will be offered psychological support.

Voluntary Participation:

Your participation in this research is entirely voluntary and if you decide to participate, you are free to withdraw at any time. You may also choose not to answer specific questions or withdraw from the study at any time. Your choice not to participate or choice to withdraw will not affect any treatment needs that you may have at Kenyatta National Hospital now and in the future.

Confidentiality:

Your identity will be kept confidential. Your name or any other personal identifier will not be used in any reports or publications arising from this study. Instead, you will be assigned a unique study number to protect your identity.

The questionnaires that you will complete will be stored safely, with nobody having access to them apart from the investigators. The data collected from this study will be entered into a password protected computers and kept away from public access.

Compensation:

You will not be paid to participate in this study.

Additional Information:

If you have questions about the study that are not answered in the consent information, please ask them. In addition, if you have questions in the future you may contact the following:

1. Investigator:

a. Dr. Caroline Vundi

Tel: 0719891344

Email: cvundi@gmail.com

2. Supervisors:

Dr.Kangethe Rachel

rkangethe@uonbi.ac.ke

Dr. Catherine .W. Gitau

cwanjagitau@gmail.com

3. Kenyatta National Hospital/University of Nairobi Ethics & Research committee

P.O Box 19676 - 00202 Nairobi

Tel: (254 – 020) 2726300-9, Ext. 44355

Email: uonknh_erc@uonbi.ac.ke

Appendix 2. Consent explanation Document (Swahili Version)

HATI YA RIDHAA

Andiko: Idadinamifumoyashidazaakilimiongonimwawatotonavijanakatikahospitaliya Kenyatta National Hospital.

Nambari ya Utambulisho ya mshiriki -----

Tarehe -----

Utangulizi

Mimi Dr. Caroline Vundi ni mwanafunzi w auzamili katika chuo kikuu cha Nairobi.

Ningependakufanyautafitihuukuhusuidadi na mifumo ya shida za akili miongoni mwa watoto na vijana waliokuwa na ugonjwa wa mwili katika hospitali ya Kenyatta. Kufikia lengo hili, tunahitaji wangonjwa takriban 245 kujaza dodoso za utafiti. Ningependa kukuomba ushiriki/ utoe idhini ya jamaa wakok ushiriki katika utafiti huu.

Mahitaji ya kushiriki

Ili kushiriki katika utafiti huu unahitajika;

1. Kuwa miaka sita hadi miaka kumi na saba
2. Mzazi au mlezi wa kisheria kutia sahihi fomu ya ridhaa

Utaratibu

Ukikubali kushiriki katika utafiti huu;

1. Mzazi au mlezi wakisheria ataulizwa kutoa idhini ya kushiriki kwa kujaza fomu ya ridhaa.

2. Utaulizwa maswali ya kibinafsi kuhusu jamii yako na maisha yako ya kila siku, maswali kuhusu matumizi ya madawa ya kulevywa na kuhusu ugonjwa au magonjwa unayougua. Hi itakuwa katika dodoso litalochukua muda wa dakika 20.

Faida

Hakuna faida ya moja kwa moja kwa kushiriki katika utafiti huu.

Hata hivyo, matokeo ya utafiti huu yatasaidia wagonjwa, jamaa, na madaktari kuelewa vyema magonjwa ya akili katika watoto na vijana. Hii itasaidia kuboresha matibabu kwa walio na magonjwa haya.

Hatari Ya Usumbufu

Kuna uwezekano unaweza kuhisi haya au wasiwasi ukipeana habari kuhusu matatizo ya magonjwa ya akili.

Iwapo utapata usumbufu wa kisaikolojia, utapewa usaidizi wa kisaikolojia.

Kushiriki Kwa Hiari

Kushiriki kwako katika utafiti huu ni kwa hiari yako na ukiamua kushiriki una uhuru wa kuondoka kwa wakati wowote. Unaweza pia kuamua kutojibu baadhi ya maswali.

Uamuzi wako kutoshiriki ama kuondoka kutoka kwa utafiti hauta adhiri matibabu yako katika hospitali ya Kenyatta kwa sasa au katika siku za usoni.

Usiri

Utambulisho wako utawekwa kwa faragha. Jina lako wala namna yoyote ya kukutambulisha hazita tumika kwa ripoti yoyote ya utafiti huu. Badala yake utapewa nambari ya kulinda utambulisho.

Dodoso (Fomu ya maswali ya utafiti) utakayo jaza itahifadhiwa kwa usalama, hakuna mtu ataweza kuifikia isipokuwa mimi au wasimamizi wangu. Takwimu zitakazo kusanywa katika utafiti huu zitahifadhiwa kwa komputa na kuzuiliwa kwa watu wengine. Komputa zitakazo hifadhi takwimu zitalindwa na namba za kisiri ili kulinda takwimu kutokana na matumizi yasio idhinishwa, kupotea ama marekebisho.

Fidia

Hakuna fidia yoyote kwa kushiriki katika utafiti huu.

MaelezoZaidi

Iwapo unahitaji ufafanuzi zaidi au una maswali yoyote kuhusu utafiti huu unaweza kuwasiliana na;

1. Mtafiti:

a. Dr. Caroline Vundi

Tel: 0719891344

Email: cvundi@gmail.com

2. Wasimamizi:

a. Dr. Rachel Kangethe

Email: rkangethe@uonbi.ac.ke

b. Dr. Catherine Gitau

Email: cwanjagitau@gmail.com

3. Kenyatta National Hospital/University of Nairobi Ethics & Research committee

P.O Box 19676 - 00202 Nairobi

Tel: (254 – 020) 2726300-9, Ext. 44355

Email: uonknh_erc@uonbi.ac.ke

Appendix 3. Assent and Consent declaration form

Assent clause to be completed by the participant

I declare that the study has been explained to me in a manner obvious to me. I understand the nature, method, risks and benefits of the study.

My questions about the study have been answered satisfactorily.

I therefore voluntarily agree to take part in this study while reserving my right to terminate my participation at any time.

Date ----- Signature of participant -----

Date ----- Signature of researcher -----

Informed consent clause to be completed by participants' next-of-kin or legal guardian

I declare that the study has been explained to me in a manner obvious to me. I understand the nature, method, risks and benefits of the study.

My questions about the study have been answered satisfactorily.

I therefore give consent for my (state relationship) ----- to participate in this study subject to their assent. I do this while reserving my right to revoke consent at any time should there be need to.

Date -----

Signature of next-of-kin -----

Relationship to patient -----

To be completed by the researcher

I declare that I have given both a written and verbal explanation of the study. I have explained the purpose of the study, methods, risks and benefits of the study. I have answered and will continue to answer any

questions that may arise about the study. The participant will not suffer any adverse consequences in case of early termination of participation in this study.

Name of researcher -----

Signature ----- Date -----

Appendix 4. Swahili Translated consent declaration form

FOMU YA RIDHAA

Tamko la mshiriki.

Natangaza kuwa utafiti umeelezewa kwangu kwan jia ya dhahiri. Ninaelewa asili, mbinu, hatari na faida ya utafiti huu.

Maswali yangu kuhusu utafiti huu yamejibiwa kwa kuridhisha.

Kwa hivyo mimi ninakubali kwa hiari kushiriki katika utafiti huu wakati niki hifadhi haki yangu ya kusitisha ushiriki wangu wakati wowote.

Tarehe ----- Sahihi ya mshiriki -----

Tarehe ----- Sahihi ya mtafiti -----

Tamko la Jamaaumeziwakisheria

Natangaza kuwa utafiti umeelezewa kwangu kwa njia ya dhahiri. Ninaelewa asili, mbinu, hatari na faida ya utafiti huu.

Maswali yangu kuhusu utafiti huu yamejibiwa kwa kuridhisha.

Kwa hivyo mimi ninatoa idhini kwa (Taja uhusiano na Mshiriki) -----
----- kushiriki katika utafiti huu wakati niki hifadhi haki yangu ya kusitisha ushiriki wake wakati wowote.

Tarehe -----

Sahihi ya Mzazi au mlezi wa kisheria -----

Uhusiano na mshiriki -----

Tamko la Mtafiti

Ninatangazakwambanimetoamaelezo ya utafitihuu kwamaandishi na pia kwamaneno. Nimeelezea asili, mbinu, hatari na faida ya utafitihuu.

Nimejibu na nitaendelea kujibu maswali yoyote ambayo yanaweza kutokea kuhusu utafiti huu. Mshiriki hatapata athari yoyote iwapo atakomesha mapema kushiriki kwa utafiti huu.

Jina la Mtafiti -----

Sahihi -----

Tarehe -----

Appendix 5. Confidentiality Agreement

In order to maintain confidentiality, I ----- commit to observe the following:

1. Keep all information about the study confidential by not discussing or sharing it in any format with anyone other than the principal investigator.
2. Ensure security of research information, including filled questionnaires and computer used for data entry and analysis, while in my possession.
3. Not make copies of any research documents or research data unless so instructed by the principal investigator.
4. Give back all research documents, data and information to the principal investigator upon completion of my duties.

By signing this, I acknowledge that I understand and agree to observe the expectations outlined above.

Name -----

Designation -----

Sign -----

Date -----

Name of Principal Investigator -----

Sign-----

Appendix 6. Dummy tables

Dummy Table 1: Demographic Characteristics

Participant characteristics		Number	Percentage
Gender of child	Male		
	Female		
Highest Level of Education completed of child	None		
	Primary		
	Secondary		
	College		
Marital status of parent or legal guardian	Single		
	Married		
	Separated		
	Divorced		
	Widowed		
	Formal employment		

Employment status	Self employed
of parent or legal guardian	Retired
	Student
	Unemployed
Type of housing	Permanent house
	-Tiled floor
	-Number of bedrooms
	-Toilet inside or outside the house
	Temporary house

Dummy Table 2: Prevalence of child and adolescent mental disorders co-occurring with physical illness at Kenyatta National hospital

Diagnosis	File	Tool
-----------	------	------

	Number	Percentage	Number	Percentage

Dummy Table 3: Most commonly co-occurring child and adolescent mental disorders

Diagnosis		
	Number	Percentage

Dummy Table 4: Commonest co-occurring physical illness

Type	Number	percentage
1		
2		

3
4
≥ 5

Dummy Table 5: Number of psychiatric disorders per person

Number disorders per person	Number	percentage
1		
2		
3		
4		
≥ 5		

Appendix 7: Socio-demographic Questionnaire

Please answer each question as accurately as possible by selecting the correct answer or filling in the space provided.

Part 1: To be filled by researcher by interviewing the parent or legal guardian

1. What is the age of the child/adolescent in years
2. What gender is the child: Male Female
3. What is the highest level of education the child/adolescent has achieved?
.....
4. What is the current employment status of the child's/ adolescent's parent or legal guardian.....
5. What type of house does the child/adolescent live in?
Permanent house
Toilet within the house
Toilet outside the house
Self-contained rooms
Semi-permanent house
Temporary house
6. What is the marital status of the child/adolescent's parents?

Single

Married

Separated

Divorced

Widowed

7. Has anyone else in the child/adolescent's family suffered from a psychiatric illness?

Yes

No

Part 2: To be filled with information from interviewee's file

8. Does the child/adolescent have a diagnosed mental health disorder?

Yes

No

What is the diagnosis?

Appendix 8: MINI-KID Questionnaire

1. Have you felt sad or depressed, down or annoyed, **most of the day, nearly every day** for the past two weeks?

Yes

No

2. In the past two weeks, have you been bored a lot or much less interested in things (like playing your favorite games) for **most of the day, nearly every day**? Have felt that you couldn't enjoy things?

Yes

No

3. Have you **ever** felt so bad that you wished you were dead, or tried to hurt yourself, or tried to kill yourself?

Yes

No

IF YOU SAID **YES** TO THE FIRST QUESTION, SKIP THIS QUESTION.

4. **In the past year** have you felt sad or depressed, down or annoyed, **Most of the time**.

Yes

No

5. Has there **ever** been a time when you were so happy that you felt really 'up' or 'high' or 'hyper'? By 'up' or 'high' I mean feeling really good; full of energy; needing less sleep; having racing thoughts or being full of ideas.

Yes

No

6. Are you **currently** feeling 'up' or 'high' or 'hyper' or full of energy?

Yes

No

7. Has there **ever** been a time when you were so annoyed, that you yelled or started fights; or yelled at people not counting your family?

Yes

No

8. Are you **currently** feeling annoyed?

Yes

No

9. Have you **ever** been really frightened or nervous for no reason; or have you **ever** been really frightened or nervous in a situation where most kids would not feel that way?

Yes No

10 Do you feel anxious, scared or uneasy in places or situations where you might become really frightened: like being in a crowd, standing in a line (queue), when you are all alone, or when crossing a bridge, travelling in a bus, train or car?

Yes No

11. **In the past month**, have you been really afraid about being away from someone close to you; or have you been really afraid that you would lose somebody you are close to? (Like getting lost from your parents or having something bad happen to them.)

Yes No

12. **In the past month**, were you afraid or embarrassed when others were watching you? Were you afraid of being teased? Like talking in front of the class? Or eating or writing in front of others?

Yes No

13. **In the past month**, have you been unusually afraid of something like: Dogs or other animals?
High places? The rain? The dark?

Yes

No

If yes, list the specific fear: _

14. **In the past month**, have you been bothered by bad things that come into your mind that you couldn't get rid of? Like bad thoughts or urges? Or nasty pictures?

DO NOT INCLUDE SIMPLE EXCESSIVE WORRIES ABOUT REAL LIFE PROBLEMS.

Yes

No

15. In the past month, did you do something over and over without being able to stop doing it, like washing over and over? Straightening things up over and over? Counting something or checking on something over and over? Saying or doing something over and over?

Yes

No

16. Has anything really awful happened to you? Like being in a flood or earthquake? Like being in a fire or a really bad accident? Like seeing someone get killed or hurt really bad? Like being attacked by someone?

Yes

No

17. Did you respond with intense fear, feel helpless or horrified or did you feel agitated or fall apart?

Yes

No

18. In the past month, has this awful thing come back to you in some way? Like dreaming about it or having a strong memory of it?

Yes

No

19. In the past year, have you had 3 or more drinks of alcohol in a day? At those times, did you have 3 or more drinks in 3 hours? Did you do this 3 or more times in the past year?

F YES TO ANY, CODE YES

Yes

No

READ THE LIST BELOW of street drugs or medicines.

20. **In the past year**, have you taken any of them more than one time to get high? To feel better or to change your mood?

Ritalin,	diet pills,
cocaine	heroin
morphine	methadone
codeine	MDMA
inhalants (glue)	khat
THC(marijuana)	Valium

Yes

No

21. **In the past month**, did you have movements of your body called 'tics'? Tics are quick movements of some part of your body that are hard to control. A tic might be blinking your eyes over and over, twitches of your face, jerking your head, making a movement with your hand over and over, or squatting, or shrugging your shoulders over and over.

Yes

No

22. Have you **ever** had a tic that made you say something or make a sound over and over and it was hard to stop it? Like coughing or sniffing or clearing your throat over and over when you did not have a cold; or grunting or snorting or barking; having to say certain words over and over, having to say bad words, or having to repeat sounds you hear or words that other people say?

Yes

No

23. Has anyone (teacher, nanny, friend, parent) ever complained about your behaviour or academic performance?

Yes

No

24. Have you often not paid enough attention to details? Made careless mistakes in school

Yes

No

25. Have you often had trouble keeping your attention focused when playing or doing homework

Yes

No

26. Have you often been told that you do not listen when others talk directly to you?

Yes No

27. Have you often tried to avoid things that make you concentrate or think hard (like schoolwork)?

Do you hate or dislike things that make you concentrate or think hard?

Yes

No

28. Have you often lost or forgotten things you needed, like homework assignments?

Yes

No

29. Do you often get distracted easily, like sounds or things outside the room?

Yes

No

30. **In the past year :**

Have you been in trouble repeatedly? NO YES

31. Have you bullied or threatened other people? NO YES

32. Have you hurt or threatened someone (physically) on purpose? NO YES

33. Have you hurt animals on purpose? NO YES

34. Have you stolen things? NO YES

35. Have you started fires on purpose? NO YES

36. Have you lied many times in order to get things from people? NO YES

37. Have you skipped school often? NO YES

38. In the past 6 months:

Have you often argued with adults and refused to do what they asked you to do?

Yes

No

39. Have you often annoyed people on purpose?

Yes

No

40. Have you ever heard things other people couldn't hear, such as voices?

Yes

No

41. Have your friends or family ever thought any of your beliefs were strange or weird?

Yes

No

42. How tall are you? _____| cm

I don't know

43. What was your lowest weight in the past 3 months? _____kgs

I don't know

44. Have you lost 2.5kgs or more in the last 3 months?

Yes

No

I don't know

45. If you are less than age 14, have you failed to gain any weight in the last 3 months?

Yes

No

I don't know

46. Has anyone thought that you lost too much weight in the last 3 months?

Yes

No

47. In the past **three months**, did you have eating binges or times when you ate a very large amount of food within a **2-hour** period?

Yes

No

48. Have you worried **excessively** or been anxious about several things over the past 6 months?

Yes

No

49. Are you stressed out about something? Is this making you upset or making your behaviour worse?

Yes

No

Appendix 9: STANDARD OPERATING PROCEDURE FOR DATA COLLECTION

1. Introduction

Data collection tools are among the most important aspects of clinical study. They determine the amount and quality of data gathered during any research endeavor. Adequate care should be employed in their design as inadequate data collection has the potential to ruin a well conducted study.

2. Objectives

This SOP describes the process for data entry Sociodemographic questionnaire and MINI-KID questionnaire used in the stud

3. Responsibility

The Data Clerk.

4. Procedure

- a. The data manager will receive complete, quality assured, and corrected questionnaires.
- b. Data will be entered by the data manager within 2 weeks of the study visit utilizing the SPSS version 26.0.
- c. All data entry will be proofed for accuracy by the data manager using the following methods:
 - a. Visual proofing with the computer screen post data entry.
 - b. Cross-referencing with source documents as appropriate.
- d. All data entered will be initialled and dated in the appropriate location.
- e. Entered data will be saved to the local database once every 4 hours, and backed up
- f. The data manager or designee will read and understand the pertinent definitions listed in this policy and procedure.

Definitions

Confidentiality: Prevention of disclosure, to other than authorized individuals, of a sponsor's proprietary information or of a subject's identity.

This SOP has been read and understood by

Name	Date	Name	Date
1.			