PREVALENCE OF PRENATAL DEPRESSION AND ASSOCIATED FACTORS AMONG ADOLESCENT MOTHERS SEEKING ANTE-NATAL CARE AT WAJIR COUNTY REFERRAL HOSPITAL IN WAJIR COUNTY, KENYA

ADEN ISMAIL HASSAN

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE MASTERS DEGREE OF PUBLIC HEALTH EPIDEMIOLOGY AND DISEASE CONTROL OF MOUNT KENYA UNIVERSITY.

NOVEMBER 2024

DECLARATION AND APPROVAL

Declaration by student

I, the undersigned, I hereby affirm that the contents of this document are entirely of my own creation and have not been previously submitted for assessment at this or any other academic institution. I further assert that proper acknowledgment has been provided in the bibliography and references for all sources referenced within.

Signature: **Date: 13.11.2024**

Aden Ismail Hassan
Reg: MPH/2019/55971

Approval by the Supervisors

I/We hereby affirm that the research presented in this thesis was conducted by the candidate under my supervision.

Signature…… **Date……13th Nov 2024…..…**
Dr Atei Kerochi MBCHB, MPH
School of Public Health
Mount Kenya University

Signature……Owino A O…… **Date……13th Nov 2024……**
Dr Alfred Owino Odongo, PhD
School of Public Health
Mount Kenya University

DEDICATION

This endeavor is dedicated to my family for their unwavering support and encouragement for the ample time they accorded me during the entire research period.

ACKNOWLEDGMENTS

Firstly, I give thanks to Almighty ALLAH for the divine strength, guidance, endurance, and providence that enabled me to be in good health throughout my research project. Secondly, I extend my gratitude to the Mount Kenya University (MKU), School of Public Health, Department of Public Health, Lecturers, and my two supervisors Dr. Atei Kerochi and Dr. Alfred Owino who provided me with this opportunity and patiently guided me throughout the entire thesis development process. Lastly, I therefore must acknowledge the following colleagues for the commendable and generous support throughout this process, the numerous consultations and late-night calls for clarification for the points not well understood wasn't taken for granted, the support contributed immensely towards the success of this study. I am greatly indebted to Bashi Ahmed, Hish Mohamed, and Abdisalam Ahmed for their immeasurable financial and moral support towards the completion of this study.

ABSTRACT

Prenatal depression among adolescent mothers is a serious public health concern, impacting the well-being of both mother and child. This study explores the prevalence of prenatal depression and the various factors influencing it among adolescent mothers attending antenatal care at Wajir County Referral Hospital. The primary objective is to determine how widespread prenatal depression is in this population and identify socio-cultural, maternal, and healthcare-related factors that may increase risk. Specific objectives include assessing the prevalence rate of prenatal depression, understanding the socio-cultural influences, examining maternal factors, and investigating healthcare factors that contribute to depression in these young mothers. Data collection involved a questionnaire-based approach, enabling detailed quantitative analysis. Findings reveal a significant prevalence of prenatal depression among adolescent mothers in Wajir, with a notably high rate of 50.8% among those aged 15 to 18. Several socio-demographic factors, such as age, educational level, and socioeconomic status, were identified as key factors amplifying vulnerability to prenatal depression. Additional psychosocial stressors including societal stigma, lack of support networks, and cultural pressures were found to further elevate the risk of depression within this group. By considering these adolescent mothers' perspectives, the study sheds light on the complex dynamics of prenatal depression, emphasizing the need for mental health support integrated into antenatal care services. A case-control study design within the hospital setting proved particularly effective for examining prenatal depression among this population, offering a focused understanding of the issue. The study found an overall prevalence of prenatal depression at 33.3%, underscoring the urgent need for mental health support specifically tailored to the unique challenges faced by adolescent mothers in Wajir County. The study concludes that addressing the diverse factors contributing to prenatal depression can significantly improve the well-being of both adolescent mothers and their infants, supporting a healthier transition into motherhood for this vulnerable group. These findings add valuable insights to discussions on prenatal mental health for adolescent mothers in resource-limited settings, underscoring the implications for healthcare policies, intervention strategies, and community-based programs aimed at reducing prenatal depression and enhancing maternal and child outcomes in Wajir County and similar regions. To address prenatal depression effectively, the study recommends several actions. First, the integration of routine mental health screenings into antenatal visits is critical to detect and address symptoms early. The County Ministry of Health should develop community campaigns to reduce stigma surrounding adolescent pregnancy and establish support

networks to enhance young mothers' emotional well-being. Additionally, the national government should implement targeted interventions, particularly for younger mothers and those with less education, by providing educational programs within antenatal care to help build coping skills. Finally, enhanced mental health training for healthcare providers is essential, ensuring they have the resources to support adolescent mothers' mental health. Through these steps, Wajir County can improve adolescent mothers' mental health and overall well-being.

Table of Contents

LIST OF ABBREVIATIONS AND ACRONYMS

ANC: Antenatal Clinics

BDI: Beck Depression Inventory

CIDP: County Integrated Development Program

DALYs: Disability Adjusted Life Years

EPDS: Edinburgh Postnatal Depression Scale

NACOSTI: National Commission for Science, Technology & Innovation

PMTCT: Prevention of Mother-to-child Transmission

WHO World Health Organization

YLD Years Lived with Disability

List of Tables

List of Figures

DEFINITION OF TERMS

Antenatal/Prenatal Period The term refers to the entire span of time starting from the moment of conception and continuing up until the point of birth. This period encompasses the full duration of pregnancy, beginning with the fertilization of the egg by the sperm, through the various stages of embryonic and fetal development, and culminating in the birth of the baby. In the context of the study referring for the period between adolescent mother of Wajir county conceive until they give birth.

Perinatal Period Depression refers to adolescent woman aged between 12 to 19 years, who is either pregnant and attending ANC clinics or the one who has just given birth and attending the PNC clinic at Wajir County Referral Hospital who demonstrated an Edinburgh Postnatal Depression Scale (EPDS) score of ≥13

Postnatal Depression refers to depression delovelpoed by adolescent woman aged between 12 to 19 years, who has just given birth and attending PNC clinic at Wajir County Referral Hospital who demonstrated an Edinburgh Postnatal Depression Scale (EPDS) score of ≥13

Postnatal period refers to the period of adolescent mother aged between 12 to 19 years, attending the PNC clinic at Wajir County Referral Hospital who demonstrated an Edinburgh Postnatal Depression Scale (EPDS) score of ≥13

Prenatal depression the term refers to pregnant woman aged between 12 to 19 years, attending the antenatal clinic at Wajir County Referral Hospital who demonstrated an Edinburgh Postnatal Depression Scale (EPDS) score of ≥13

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Depression among adolescent mothers represents a significant concern in both the fields of nursing and public health. The occurrence of depression in young women has been documented to be around 7.5%, according to (Meadows-Oliver & Sadler, 2010). In the general female population, the incidence of depression is approximated to be approximately 20%. However, the susceptibility to depression increases considerably during pregnancy (Ajinkya, 2013a). Depression associated with childbearing can manifest during various stages: it may develop during pregnancy, known as prenatal depression; after childbirth, referred to as postnatal depression; or it can occur in both periods, which is termed perinatal depression (Ogbo, 2018). Prenatal depression is a clinical condition that emerges during pregnancy, manifesting through a range of symptoms. These symptoms can include persistent anxiety, insomnia, overwhelming feelings of guilt, chronic fatigue, irritability, forgetfulness, frequent headaches, and a sense of social isolation. (Madlala & Kassier, 2018).

The manifestation of depressive symptoms among adolescent mothers has been correlated with various adverse outcomes for both the adolescent mother and her offspring (Reid-V., 2007)An escalation in depressive symptoms has been linked with diminished maternal self-assurance and perceived levels of social support a mitigating factor for depression. Furthermore, depressive symptoms among adolescent mothers have been associated with subsequent pregnancies occurring within a span of two years following the initial birth. Moreover, maternal depression may exert deleterious effects on children's development, as offspring of mothers exhibiting higher levels of depressive symptoms demonstrate heightened emotional-social difficulties and diminished language proficiency compared to offspring of mothers with lower levels of depressive symptoms. (Pascoe, et al., 2006).

While prenatal depression among adolescent mothers stands as a noteworthy health concern akin to postpartum depression, regrettably, it has not garnered commensurate attention and consideration (Mirieri 2019). The emphasis during pregnancy predominantly centers on the physical health and welfare of both the mother and fetus, often to the detriment of mental health matters. Emotional distress and symptoms emerging during pregnancy are commonly ascribed to the hormonal fluctuations' characteristic of this phase, thereby fostering a tendency to disregard or minimize these mental health adversities. (Biaggi, et al., 2016).

Globally, the prevalence of prenatal depression in High-Income Countries (HICs) is estimated to range between 10% and 15%. Conversely, research suggests that Low- and Middle-Income Countries (LMICs) contend with even higher rates of prenatal depression. This discrepancy underscores the diverse impact of socioeconomic factors on maternal mental well-being across global regions (Thompson & Ajayi, 2016a). Consequently, adolescent mothers may confront heightened occurrences of both prenatal and postnatal depression compared to their adult counterparts. Approximately 20% of adolescents exhibit symptoms indicative of depression during pregnancy and postpartum periods. Nonetheless, the actual prevalence of depression among pregnant and postpartum adolescents may surpass these estimates. due to inadequate screening for depression symptoms or a lack of awareness regarding prenatal and postpartum depression. (Govender, et al., 2019). In the African cultural context, the act of childbearing holds significant value for women. Nonetheless, when pregnancies occur unexpectedly, facing rejection from the partner and encountering insufficient familial support can cause emotional distress for the pregnant adolescent and young parent. (Petersen, 2014). Given these circumstances, it is unsurprising that antenatal and prenatal depression would manifest. Unplanned pregnancies, stemming from adolescents partaking in premarital sexual activity, early marriages, as well as instances of physical and sexual abuse, can result in subsequent psychological distress, anxiety, and depression are prevalent among pregnant and postpartum adolescents. Additionally, cultural stigma, social ostracism, oppressive family dynamics, and gender inequality all compound the mental health difficulties encountered by these young mothers (Odimegwu, et al., 2018). Various risk factors contribute to prenatal depression among adolescent mothers, although no singular cause has been definitively identified (Rubertsson, 2014). Predictors of prenatal depression encompass a broad spectrum and can be broadly categorized into three primary domains: social, psychological, and biological risk factors.

In the social domain, several elements come into play. These include a low level of education, which may limit opportunities and exacerbate feelings of inadequacy; a low socioeconomic status, which can lead to financial strain and insecurity; a lack of social support, leaving young mothers feeling isolated and overwhelmed; and various stressors such as economic deprivation, which can further compound their emotional distress (Bonari, et al., 2004).

The biological domain encompasses a range of factors. These include gestational age, where the stage of pregnancy may influence mental health; maternal age, as younger mothers may be at a higher risk due to a lack of preparedness and resources; genetic and hormonal susceptibility, where

inherent predispositions and hormonal fluctuations during pregnancy can significantly impact mood and emotional stability; and obstetric complications, which can increase anxiety and stress levels (Howard, et al., 2014).

From a physiological perspective, the hormonal fluctuations experienced throughout pregnancy have the potential to stimulate heightened activation of the hypothalamus-pituitary-adrenal (HPA) axis may be implicated in the initiation of depressive symptoms. (Gelman, et al., 2015).

Given this complex interplay of factors, pregnant adolescents often suffer in silence, their struggles unrecognized and unaddressed. Therefore, it is essential to have a thorough understanding the prevalence of depression and its correlated risk factors among adolescent mothers is pivotal for crafting efficacious interventions and furnishing requisite support to ameliorate their mental health and holistic welfare.

1.2 Statement of the Problem

Prenatal depression among adolescent mothers is a significant public health concern, affecting both the mothers' well-being and their infants' health. Studies conducted in both high-income countries (HICs) and low- and middle-income countries (LMICs) have identified several key factors linked to prenatal depression in young mothers. These factors include dysfunctional family dynamics, limited socioeconomic resources, inadequate familial support, social isolation, a history of physical and sexual abuse, neglect from partners, and heightened stress levels (Getinet, et al., 2018). Globally, the occurrence of prenatal depression among pregnant adolescents varies. Research indicates that maternal depression is more prevalent in low- and middle-income countries compared to high-income nations (Kerie, et al., 2017).

Adolescent mothers are at a higher risk of experiencing prenatal depression compared to adult mothers. Previous research suggests that approximately 20% of adolescents encounter symptoms of depression during pregnancy and after childbirth. However, this estimate may not fully capture the extent of depression among pregnant adolescents, as many are not screened for depressive symptoms or may be unaware of the presence of prenatal depression (Govender, et al., 2019)

In sub-Saharan Africa, the alarmingly high prevalence of prenatal depression further exacerbates the challenges faced by adolescent mothers, underscoring the need for targeted interventions and support mechanisms to address this critical issue can largely be attributed to the significant rate of teenage pregnancies. According to a study conducted by (Kassa, et al., 2018) an estimated 19.3% of adolescent mothers in the region experience prenatal depression. However, the actual number

of cases is likely much higher, as many instances of prenatal depression remain undiagnosed and untreated, particularly in low-income countries within Africa.

In Kenya, the rate of adolescent pregnancies, and consequently prenatal depression, is continually on the rise. This issue is exacerbated by the expansion of urban informal settlements, which are densely populated with an emerging class of urban poor. Many of these residents are young people who have limited access to healthcare, education, and even basic sanitation and resources, creating an environment ripe for mental health issues.

The situation in Wajir County mirrors these broader regional trends. Here, the high prevalence of prenatal depression can be attributed to a combination of early and forced marriages, elevated poverty levels, widespread drug and substance abuse, a significant HIV prevalence, high rates of teenage pregnancies, and low levels of education (CIDP, 2018). These factors collectively contribute to an environment where prenatal depression among adolescent mothers is a particularly acute problem.

This complex and challenging scenario in Wajir County prompted the researcher to focus on the issue of prenatal depression among adolescent mothers who are seeking antenatal care at the Wajir County Referral Hospital. By studying this population, the researcher aims to shed light on the prevalence and underlying factors of prenatal depression, ultimately contributing to better understanding and addressing this critical public health issue.

1.3 Justification

Depressive symptoms in adolescent mothers have been linked to a wide array of negative outcomes, affecting both the young mothers and their children. These adverse effects can include poor physical health, impaired emotional and cognitive development in the child, and increased vulnerability to future mental health issues. Despite the significance of this problem, there is a notable scarcity of research on the factors contributing to prenatal depression in Africa (Thompson & Ajayi, 2016). This lack of data is also evident in Kenya, there is a scarcity of published studies examining the factors linked to prenatal depression. (Ongeri, et al., 2016).

Understanding the determinants of prenatal depression within Wajir County is crucial. Identifying these factors will help in prioritizing and implementing effective interventions tailored to this specific context. The primary aim of this study is to evaluate the prevalence and severity of prenatal maternal depression among adolescent mothers in Wajir County. The findings from this research

will offer crucial insights, guiding the development of targeted interventions and the creation of effective guidelines for the prevention and management of prenatal depression at the Wajir County Referral Hospital.

Through a comprehensive analysis of the prevalence and underlying causes of prenatal depression in this setting, the study aspires to contribute to the broader body of knowledge on maternal mental health in low-resource environments (Ongeri, et al., 2016). It is anticipated that the findings will not only improve outcomes for adolescent mothers and their children in Wajir County but also act as an exemplar for analogous areas confronting similar obstacles. This research is a critical step towards enhancing the overall well-being of adolescent mothers and their families, ultimately leading to healthier communities.

1.4 Objectives for the Study

1.4.1 Study's Broad Objective

To determine the prevalence of the prenatal depression and associated factors among adolescent mothers seeking ante-natal care at the Wajir County Referral hospital.

1.4.2 Specific Objectives

This study will be hinged on the following specific objectives.

i. To determine the prevalence of prenatal depression among adolescent mothers attending the antenatal care clinic at Wajir County Referral Hospital, Kenya.
ii. To identify the socio-cultural factors influencing the prevalence of prenatal depression among adolescent mothers at Wajir County Referral Hospital.
iii. To assess the maternal factors linked to the prevalence of prenatal depression among adolescent women attending the antenatal care clinic at Wajir County Referral Hospital.
iv. To investigate the maternal factors associated with the prevalence of prenatal depression among adolescent mothers at Wajir County Referral Hospital.

1.5 Research Questions

i) What is the prevalence of prenatal depression among adolescent mothers attending the antenatal clinic at Wajir County Referral Hospital in Kenya?

ii) What social and cultural factors are associated with prenatal depression among adolescent mothers attending the antenatal clinic at Wajir County Referral Hospital in Kenya?

iii) What maternal factors are linked to prenatal depression among adolescent mothers attending the antenatal clinic at Wajir County Referral Hospital in Kenya?

iv) What healthcare system factors are associated with prenatal depression among adolescent mothers attending the antenatal clinic at Wajir County Referral Hospital in Kenya?

Significance of the Study

Following the increasing numbers of prenatal depression among women attending the Wajir County referral hospital, there is an increased need to investigate the factors that contribute to the prenatal depression among adolescent mothers. Therefore, identifying these factors and embarking on the screening of prenatal depression for the young mother is a vital part in preventing effects of prenatal depression to both the mother and the child. The main aim of this research is to discern and analyze the diverse factors contributing to prenatal depression among adolescent mothers receiving care at the antenatal clinic in Wajir County Referral Hospital. This clinic will serve as a representative sample for understanding the broader prevalence and determinants of prenatal depression across Wajir County. The insights gained from this research will be invaluable in several ways.

First, the study findings will equip healthcare professionals with the necessary information to manage prenatal depression more effectively. By understanding the specific factors that influence depression in this demographic, healthcare providers can tailor their approaches and interventions to better meet the needs of adolescent mothers. This targeted care has the potential to significantly improve mental health outcomes for these young mothers and their babies.

Second, the research will provide critical data that can assist policymakers in the development of context-specific policies. These policies will be designed to address the unique challenges faced by adolescent mothers in Wajir County. By grounding policy decisions in empirical evidence, it will be possible to create more relevant and effective strategies for managing maternal depression. This, in turn, can lead to enhanced support systems within clinics and improved overall healthcare delivery.

Ultimately, the study aims to bridge the gap between clinical practice and policymaking. By providing a comprehensive understanding of the factors contributing to prenatal depression, the research will pave the way for more informed decisions and better resource allocation. The goal is to foster an environment where adolescent mothers receive the care and support, they need, thus improving their quality of life and promoting healthier communities in Wajir County.

1.6 Limitations and Delimitations

This study has limitations. Its scope is limited to the confines of Wajir County Referral Hospital, meaning that the findings may not be broadly applicable to all adolescent mothers attending antenatal clinics throughout Wajir County. Additionally, there is a potential issue of reverse causality to consider. In certain instances, prenatal depression might occur before the exposure under investigation, posing difficulty in establishing definitive causality.

Furthermore, the study's focus solely on Wajir County Referral Hospital may restrict the applicability of the findings to other healthcare settings, and if applied to other regions should be approached with caution. Variations in healthcare infrastructure, cultural norms, and socioeconomic factors among different clinics or counties may influence the prevalence and determinants of prenatal depression. Therefore, generalizing the results beyond the specific context of the study site requires careful consideration.

Furthermore, the complexity of interpreting the relationship between prenatal depression and its potential determinants should be acknowledged, including the possibility of reverse causality. While the study endeavors to identify factors associated with prenatal depression, causal inference may be challenging due to the bidirectional nature of the relationship, it must consider the temporal sequence of events to establish causal relationships accurately. Factors such as stressors during pregnancy or social support may both influence and be influenced by prenatal depression, complicating the interpretation of causality.

Acknowledging these limitations is essential for interpreting the study's findings accurately and for informing future research directions. Despite these challenges, the study still holds value in providing insights into the prevalence and potential determinants of prenatal depression among adolescent mothers in the specific context of Wajir County Referral Hospital.

1.7 Conceptual Framework

The conceptual framework for the thesis on "Prevalence of Prenatal Depression and associated factors Among Adolescent Mothers Seeking Antenatal Care at Wajir County Referral Hospital" is structured on the interaction of various domains influencing prenatal depression in adolescent mothers. The framework incorporates individual, social, and cultural factors, as well as healthcare system elements, to comprehensively explore the complex determinants of prenatal depression in this specific demographic.

The figure below Demonstrates the connection among the independent variables, dependent variable, and the interdependent variables.

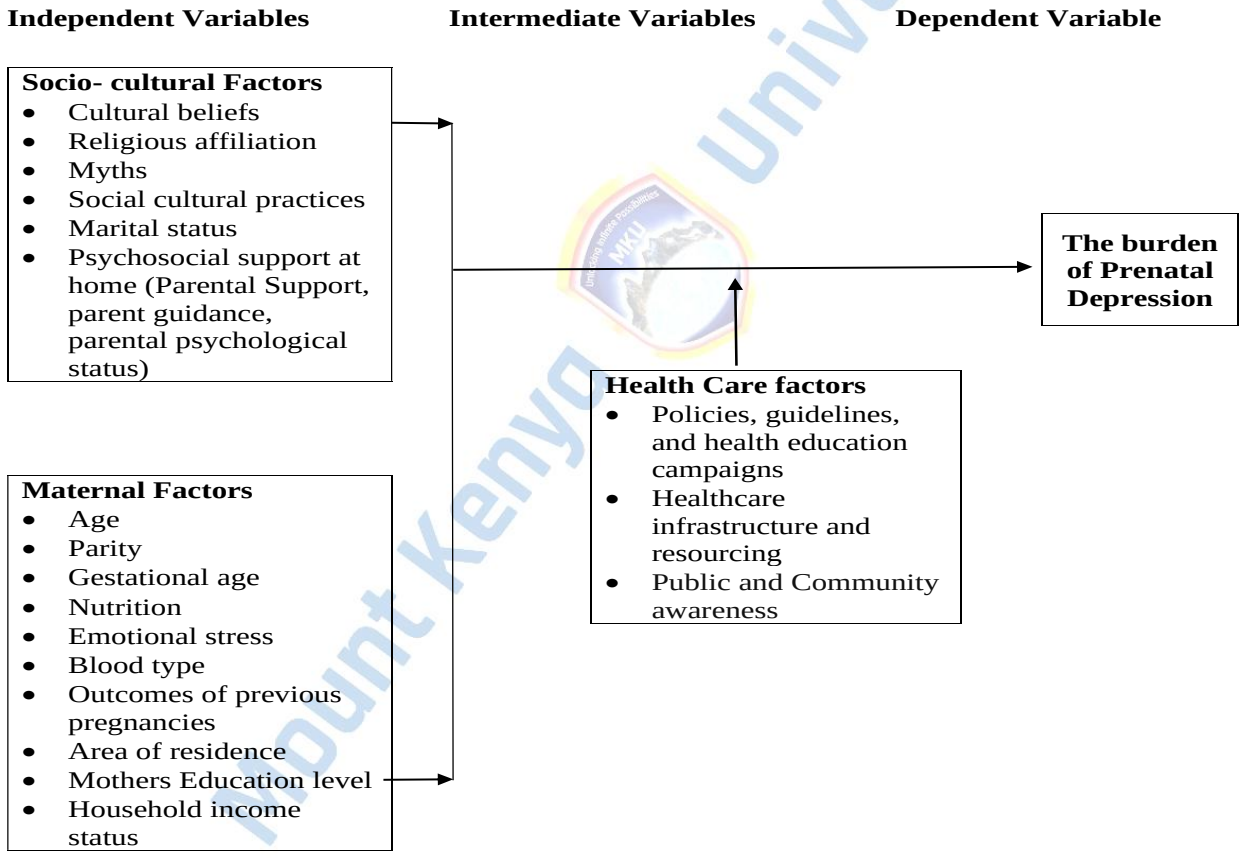


Figure 1 Conceptual Framework

For a study on the prevalence of prenatal depression and associated factors among adolescent mothers seeking antenatal care at Wajir County Referral Hospital, a conceptual framework could categorize the main influencing factors into three domains: healthcare factors, maternal factors,

and socio-cultural factors. These interconnected domains help to explain how various influences might contribute to prenatal depression in adolescent mothers.

1.7.1. Healthcare Factors

Healthcare factors encompass elements related to the accessibility, quality, and type of antenatal services available to adolescent mothers. These include:

Community awareness: Limited access to antenatal care services due to community and public, or a lack of healthcare facilities within proximity can increase the likelihood of unmonitored pregnancies, exacerbating anxiety and mental health challenges.

Healthcare infrastructure and resourcing: The standard of care provided at healthcare facilities, including mental health screenings, prenatal education, and counseling services, is affected by the healthcare infrastructure and resourcing. High-quality care with empathetic and non-judgmental staff may reduce prenatal depression risk, while substandard care or judgmental attitudes may increase it which are directly linked to the resourcing

Policies, guidelines and health education campaigns: Adolescents often experience stigma from healthcare providers, especially if they are young, unmarried, or unsupported by family. Negative or judgmental attitudes from healthcare providers may deter young mothers from seeking care, impacting their mental health. The healthcare system ought to develop policies and guidelines that tend to protect this vulnerable population in the society against this emerging stigma and negligence.

1.7.2. Maternal Factors

Maternal factors include characteristics unique to the adolescent mother, such as her age, health status, social support, and psychological resilience. These factors often influence vulnerability to prenatal depression:

Age and Developmental Stage: Adolescents are still undergoing significant cognitive, emotional, and social development. The physical and emotional demands of pregnancy during this period can lead to overwhelming stress and increase the risk of depression.

Previous Mental Health History: Adolescents with a history of mental health issues, such as anxiety or depression, may be more susceptible to prenatal depression. Previous trauma, substance abuse, or family history of mental health issues may also contribute to a higher risk.

Social and Family Support: The level of support from family members, partners, and peers plays a critical role. Adolescents with strong social support tend to report lower stress levels, while those without adequate support may feel isolated and vulnerable to depression.

Knowledge and Preparedness for Motherhood: Adolescents often lack knowledge about pregnancy and motherhood, leading to uncertainty, fear, and anxiety. Those who feel unprepared for the responsibilities of motherhood may experience higher levels of prenatal stress and depressive symptoms.

1.7.3. Socio-Cultural Factors

Socio-cultural factors encompass community attitudes, cultural beliefs, and societal expectations that influence adolescent pregnancy and mental health, especially within Wajir County's unique cultural context:

Cultural Beliefs about Adolescent Pregnancy: In some communities, adolescent pregnancy may be stigmatized, especially for unmarried young women. Societal judgment or cultural disapproval can lead to shame, isolation, and stress, exacerbating depression in young mothers.

Gender Roles and Expectations: Traditional gender roles that define women primarily by their reproductive roles can place additional pressure on adolescent mothers. Young mothers may face pressure to conform to these roles while grappling with their own developmental needs, creating a tension that impacts mental well-being.

Religious and Moral Expectations: Religious views on adolescent pregnancy outside of marriage may lead to moral judgment from the community. This pressure can intensify feelings of shame or fear in pregnant adolescents, worsening depression.

Economic Hardships and Socioeconomic Status: Adolescents in economically disadvantaged settings face financial challenges that make it difficult to access healthcare or necessary resources

for pregnancy. Economic insecurity may lead to feelings of inadequacy, fear for the future, and increased mental stress.

Community Support Networks: In some cultures, the extended family and community play a strong role in raising children, offering support to young mothers. However, the lack of supportive community networks can increase the likelihood of isolation and prenatal depression among adolescents.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Depression is a mental health condition marked by ongoing feelings of sadness and a diminished interest or pleasure in activities once enjoyed. It impacts various aspects of daily life, including sleep patterns (either excessive sleeping or insomnia), appetite changes, fatigue, low energy levels, heightened anxiety, restlessness, and difficulties with concentration. Globally, depression ranks as a prominent contributor to disability and significantly adds to the overall burden of disease. The origins of depression are multifaceted, stemming from a combination of social, psychological, and biological factors. (WHO, 2014). Depression during pregnancy can result in decreased engagement with prenatal healthcare, negative birth outcomes, and an increased likelihood of experiencing postnatal depression. Regular screening for antenatal depression is crucial to promptly identify pregnant individuals exhibiting symptoms of depression. (Chorwe-Sungani & Chipps, 2017).

2.2 Prenatal Depression Screening Instruments

The Edinburgh Postnatal Depression Scale (EPDS) stands as one of the most widely utilized instruments for screening depression during both the prenatal and postnatal periods in Low- and Middle-Income Countries (LMICs). Validated in 20 different languages, this scale comprises 10 items that evaluate women's feelings and experiences over the preceding week using a Likert scale, with scores ranging from 0 to 30. The threshold for diagnosing prenatal depression varies based on the language version of the EPDS employed. In the English version, a recommended cut-off score of ≥13 is suggested for detecting antenatal depression. Notably, a British validation study conducted in primary healthcare settings reported a specificity of 78% and a sensitivity of 86% for the EPDS scale. (Cox, et al., 1987).

Besides the EPDS scale, a variety of other screening tools are at hand for evaluating prenatal depression, such as the other commonly used tools for assessing depression include the Beck Depression Inventory (BDI), Mini-International Neuropsychiatric Interview (MINI-Plus), and Hamilton Depression Rating Scale (HAM-D). The BDI, a self-administered questionnaire consisting of 21 items, evaluates depressive symptoms and attitudes in individuals aged 13 years and older. It demonstrates a sensitivity of 81% and specificity of 92%, with scores ranging from 0 to 63. (Beck, et al., 1961).

The HAM-D scale, administered by clinicians, evaluates alterations in depressive symptoms throughout treatment. It employs a Likert scale spanning from 0 to 4 and is available in two iterations: the original 17-item version (HDRS17) and the subsequent 21-item version (HDRS21), with the latter intended for subtype classification of depression. The HAM-D scale demonstrates a sensitivity of 86.4% and specificity of 92.2%. (Hamilton, 1960).

The Mini-International Neuropsychiatric Interview (MINI-Plus), a meticulously structured interview designed for application in both clinical practice and research within primary care settings, represents another invaluable tool. Its administration typically consumes approximately 15 minutes, rendering it particularly suitable for clinical trials and epidemiological studies. Additionally, it serves as the gold standard instrument for diagnosing prenatal depression during the second trimester. (Amorim, 2000).

In summary, the Edinburgh Postnatal Depression Scale and Beck Depression Inventory stand out as the most commonly employed tools for assessing prenatal depression (Castro, et al., 2015). The EPDS scale, in particular, has shown remarkable reliability, specificity, sensitivity, and validity, rendering it the preferred option for screening antenatal depression in resource-limited settings (Chorwe-Sungani & Chipps, 2017)

2.3 Prevalence of Prenatal Depression among Adolescent Mothers

Adolescent pregnancy carries enduring medical, emotional, and economic repercussions for both the mother and child, with depressive symptoms potentially arising during the postpartum period regardless of maternal age (Sara, et al., 2013). Rates of depressive symptoms among adolescent mothers surpass those of non-pregnant/parenting adolescents and pregnant or parenting adults. Prenatal depression typically affects 10-15% of pregnant women in High-Income Countries (HICs) (Collin, et al., 2013).

A thorough examination of 714 studies and surveys conducted in HICs revealed prenatal depression prevalence rates of 7.4%, 12.8%, and 12.0% during the first, second, and third trimesters respectively (Bennet, et al., 2004). In contrast, the prevalence of prenatal depression in Low- and Middle-Income Countries (LMICs) appears slightly higher, with a meta-analysis by (Fisher, et al., 2012)reporting a prevalence of 15.6%. Additionally, a systematic review focusing on prenatal and postnatal psychological well-being in Africa found a mean prevalence of prenatal depression at 11.3%, with postnatal prevalence slightly higher at 18.3%. (Mirieri, 2019).

In sub-Saharan Africa, depression stands as a significant contributor to years lived with disability (YLD), with depressive disorders accounting for 2.87% of the total disability-adjusted life years (DALYs) among Kenyan women aged 15-49 (Osok, et al., 2018). Unsafe sex and intimate partner violence are among the commonly identified risk factors in the Global Burden of Disease estimates associated with DALYs among Kenyan women (Osok, et al., 2018). UNFPA projects that the potential number of adolescent pregnancies in sub-Saharan Africa could potentially equal or exceed the number in South Asia by 2025-2030, with over 3 million adolescents possibly experiencing their first birth by the age of 15 years. (Osok, et al., 2018).

A study on prenatal depression that was conducted through a longitudinal selection of women attending antenatal clinic in Kenya (consisting 170 women aged 18-25, 26-29, 30-44years), and in Southern Brazil (comprising 4426 pregnant mothers, aged <20, 20-34, <35years) reported the prevalence of 18% and 16% respectively (Coll, et al., 2017; Mirieri, 2019). Results from research conducted in Northern Ethiopia indicated a prevalence A study found that prenatal depression affected 31.1% of the population. Another study conducted in public health centers in Addis Ababa reported a prevalence of 24.94% for prenatal depression (Biratu & Haile, 2015). Similarly, in Kenya, research conducted at Kenyatta National Hospital identified a prevalence rate of 29% for prenatal depression among adolescent mot ghers attending the antenatal clinic. (Mirieri, 2019).

2.4 Factors influencing Prenatal Depression

2.4.1 Economic factors associated with Prenatal Depression

Several studies reveal that the economic status of mothers during prenatal periods at family level as well as developed and developing nations differ greatly. According to certain studies (Hoffman et al., 2000; Marcus et al., 2003; Haas et al., 2005; Lovisi et al., 2005; Faisal, et al., 2007), low economic status, which is measured at the household level by the level of education, low income, and unemployment rate in such families, has been linked to prenatal depression. In her hospital-based control study of 170 prenatal women (18-44 years) that of 34 cases and 136 controls, (Mirieri, 2019) established in her main findings that marital status, occupation, domestic violence, and social support were identified as significant determinants of prenatal depression. Prenatal depression may occur from low economic class women's likelihood to have insufficient financial resources to handle the rising costs of pregnancy. Prenatal depression can result from a woman's lack of social support because they are also more likely to receive minimal emotional support from their partners, families, and friends.

Furthermore, women in impoverished nations are more exposed to prenatal depression risk factors than women in developed nations are. The primary determinants of antenatal depression include a history of mental health issues, low maternal education, low socioeconomic status, unintended or unwanted pregnancies, current or past pregnancy complications, intimate partner violence, recent adverse life events, being single, and lacking social support (Howard, et al., 2014). These have exacerbated problems like the failure to recognize or treat prenatal depression, the rise in the risk of poor nutrition, and the inability to access ongoing medical care. To make matters worse, many young expectant mothers below 30 years have reportedly engaged in substance misuse, smoking, and drunkenness, all of which have the potential to have a negative impact on the perinatal outcome (Hoffman & Hatch, 2000; Chung et al., 2001; Larsson et al., 2004).

2.4.2 Socio-demographic Risk factors

Social risk factors for antenatal depression encompass various elements, such as low levels of education, low socioeconomic status, limited social support, and stressors like economic deprivation (Bonari, et al., 2004). Numerous studies have highlighted the significant association between prenatal depression and women of reproductive age, typically ranging from 20 to 30 years, who attend antenatal care (ANC) or postnatal clinics. For instance, research in India revealed higher levels of depression among pregnant participants under thirty compared to those aged thirty and above (Bhat, et al., 2015).

Similarly, a study in Hungary found elevated prenatal depression rates among women under twenty compared to those over twenty (Bodecs, et al., 2013). Another study reported that women under twenty-five had 2.6 times higher odds of experiencing prenatal depression than those over twenty-five (Raisanen, et al., 2014). This trend may be due to the heightened vulnerability of young mothers facing financial instability, potentially leading to depression during pregnancy.

However, conflicting findings suggest that increasing maternal age may also elevate the risk of prenatal depression. For instance, research in Pakistan found that women over thirty had three times higher odds of experiencing prenatal depression compared to those under thirty (Ali, Azam, Ali, Tabbusum, & Moin, 2012). This could be linked to a higher prevalence of psychological distress with increasing age, predisposing women to prenatal depression. Nonetheless, some studies have failed to establish a significant correlation between maternal age and depression during pregnancy (Mirieri, 2019)

Low levels of education have consistently emerged as a determinant of prenatal depression in various studies. Women with lower educational attainment are at a heightened risk of depression during pregnancy compared to their more educated counterparts (Bhat, Hassam, Shafiq, & Sheikh, 2015). This could be attributed to the positive impact of education on lifestyle choices, such as regular exercise, improved diet, better sleep habits, and abstaining from alcohol, which can help alleviate depression symptoms during pregnancy (Osok, et al., 2018).

Moreover, educated women of reproductive age (15-44 years) are likely to have a robust psychological support system, which acts as a protective factor against prenatal depression. Additionally, literacy enhances an individual's self-confidence and dignity, further reducing the risk of prenatal depression (Dadi, et al., 2020). However, contradictory findings from Malawi suggest that higher education levels may actually increase the risk of prenatal depression, possibly due to increased awareness and reporting of depressive symptoms among educated individuals (Stewart, Umar, Tomenson, & Creed, 2014). Despite these variations, some studies have failed to establish a significant association between education level and prenatal depression (Husain, et al., 2012).

A review of literature has highlighted that a majority of women of reproductive age (15-44 years) with low income or unemployment experience heightened anxiety and depressive symptoms during pregnancy compared to their employed counterparts (Dibaba, Fantahun, & Hindin, 2013). Furthermore, women whose spouses are unemployed or hold unskilled positions are at a higher risk of antenatal depression compared to those with spouses in skilled or professional roles (Babu, et al., 2018). Studies conducted in Italy and Kenya also support this association, with unemployment significantly increasing the likelihood of prenatal depression. (Giardinelli, et al., 2012); (Osok, et al., 2018).

2.4.3 Cultural Factors associated with Prenatal Depression

Culture plays a pivotal role in shaping perceptions of pregnancy and postpartum adaptation. Defined as the shared values, beliefs, norms, and practices of a particular group, culture guides individuals' thoughts, decisions, and behaviors (Rena, 2008). Within this cultural context, the social support system emerges as a critical socio-cultural determinant that can either alleviate or exacerbate prenatal depression among expectant mothers. Social support encompasses various forms of assistance provided by spouses, family members, and friends (Harandi, et al., 2017). In Nigeria, a study found that the absence of social support significantly increased the risk of prenatal

depression has been quantified with an adjusted odds ratio (OR) of 6.08 (P<0.031) in studies by (Adewuya, et al., 2017).

Similarly, research conducted in Ethiopia indicated that social support serves as a protective factor against prenatal depression, showing an odds ratio of 2.3 (Dibaba, et al., 2013). Social support during pregnancy acts as a buffer against stressful life events, thereby reducing the likelihood of developing prenatal depression (Dibaba 2013).

Marital satisfaction and perceived social support are significant protective factors against prenatal depression, with an adjusted odds ratio of 0.62 (P<0.009) (Bennet, et al., 2004). Conversely, a strained relationship with a spouse is a recognized risk factor for prenatal depression (Martini, et al., 2015). For instance, a study in Italy found that individuals with strained spousal relationships were four times more likely to develop prenatal depression compared to those with healthy marital bonds (Giardinelli, et al., 2012). Strong social support from spouses and close family members during pregnancy provides essential emotional and mental reinforcement, helping pregnant women cope with anxiety and stressors, and easing the transition into motherhood (Mc Leish & Redshaw, 2017)

Marital status significantly influences the level of social support received during pregnancy. Several studies have identified being single, divorced/widowed, or not cohabiting with a partner as risk factors for prenatal depression (WHO, 2014). This is likely due to the absence of a spouse to provide support during pregnancy. Moreover, in African culture, single parenthood is often stigmatized, with unmarried pregnant women being viewed as promiscuous. Therefore, the lack of a stable marital relationship may exacerbate feelings of isolation and stress, contributing to the onset of prenatal depression. Conversely, being in a supportive and satisfying marital union can provide expectant mothers with a sense of security and emotional reinforcement, thereby reducing their vulnerability to prenatal depression.

Furthermore, cultural norms and societal expectations play a significant role in shaping social support dynamics during pregnancy (Bawahab, et al., 2017). In many African societies, single parenting is frowned upon, and unmarried pregnant women may face social stigma and judgment. This societal pressure can compound feelings of loneliness and anxiety, heightening the risk of prenatal depression among unmarried or unpartnered expectant mothers (Biratu & Haile, 2015). Conversely, being in a stable marital relationship or having strong familial support networks can offer a sense of belonging and acceptance, buffering against the negative impact of societal norms and reducing the likelihood of prenatal depression.

Overall, the quality of social support, particularly from spouses and close family members, is instrumental in promoting maternal mental well-being during pregnancy (Biaggi,et al., 2016). Interventions aimed at enhancing social support systems and addressing relationship dynamics can play a pivotal role in preventing and managing prenatal depression, ultimately fostering healthier outcomes for both mothers and their unborn children. (Adewuya, et al., 2017).

2.4.4 Adverse Life Events.

The onset of prenatal depression often worsens in response to significant life stressors (Abuidhail and Abujilban 2014); (Brittain, et al., 2015). These stressors vary in intensity, and an individual's ability to cope is influenced by their Perception of stress during pregnancy can significantly impact mental health. Stressful events such as relationship breakdowns, job loss, experiences of assault or rape, and the illness or loss of a family member can all heighten the risk of depression during pregnancy. Additionally, the physical and hormonal changes associated with pregnancy itself can induce stress, further increasing the likelihood of developing depression. However, the presence of a robust social support system can mitigate the impact of these adverse life events (Sara, et al., 2013).

Physical partner violence during pregnancy is a strong predictor of depression (Martini et al., 2015). Exposure to domestic violence, particularly from an intimate partner, and a history of sexual assault significantly increase the risk of developing depression during pregnancy. These traumatic experiences can have long-lasting effects on mental health, compounding the challenges faced by expectant mothers (Bhat, et al., 2015).

It is crucial to recognize the role of these stressors in contributing to prenatal depression and to implement interventions aimed at mitigating their impact. Strengthening support systems, providing counseling and resources for coping with stress, and implementing policies to address domestic violence are essential steps in promoting maternal mental well-being during pregnancy (Coll, et al., 2017). By addressing these underlying factors, healthcare providers and support networks can work together to create a more supportive environment for expectant mothers, ultimately reducing the burden of prenatal depression and improving outcomes for both mothers and babies. (Dibaba, Fantahun, & Hindin, 2013; Mirieri, 2019).

2.4.5 Healthcare Factors Contributing to Prenatal Depression

Healthcare, being a significant predictor of both prenatal and postpartum depression raises the likelihood of unfavorable maternal and fetal outcomes, including early birth, preterm labor, low birth weight, and improper baby feeding habits (Dunkel & Tanner 2012, Grote 2010; Smith 2011). Prenatal depression has been linked to premature birth and underweight newborns, according to recent research conducted in Kenya (Mochache et al., 2018; Madeghe et al., 2016). Additionally, prenatal depression raises the chance of depression and attention issues in the children as well as impaired neurocognitive and socio-developmental disorders such poor motor and regulatory abilities, anti-social conduct, and impaired neurocognitive and socio-developmental disorders. Children born to depressed moms have been linked to increased medical costs, subpar immunization rates, and frequent hospitalization (Golbasi et al., 2010).

Biological stressors for prenatal depression include gestational age, mother age, hormonal and genetic predisposition, and obstetric complications (Howard *et al.* 2014). Pregnant women who are in their first month of pregnancy are more likely to experience depression than those who are in their late pregnancy. This is likely due in part to the first trimester pregnancy symptoms, which most women find difficult to deal with20. These symptoms include fatigue, nausea, food aversions, and heartburn. Anxiety or sadness may emerge from a history of loss or stillbirth, which can be traumatizing (Adewuya *et al. 2007;* Rubertsson *et al. 2014*). A public health priority must be surveillance and prevention research due to the greater risks of negative health consequences for both mothers and infants associated with antenatal depression.

Healthcare-related factors significantly contribute to prenatal depression among pregnant women, including adolescent mothers. Ensuring access to quality healthcare necessitates an adequate number of trained health workers, sufficient equipment and supplies, and reliable transportation for emergency referrals (Makii, 2015). According to (Rahman, et al., 2011), the effective coordination of care for adolescent mothers is influenced by three service-related factors: availability, acceptability, and affordability. Research indicates that countries with high maternal, perinatal, and neonatal mortality rates often suffer from inadequate and poor-quality health services, leading to reduced utilization of these services. A study of 15 health facilities in Eastern Uganda concluded that improving the quality of antenatal care (ANC) requires better staffing, infection control facilities, and drug supplies, alongside enhanced counseling for risk factor recognition and birth preparedness (Makii, 2015).

At the healthcare provider level, the quality of medical services, particularly technical proficiency as indicated by medication availability, is a significant determinant of healthcare demand (Muriithi, 2013). Muriithi (2013) noted that insufficient health information is linked to variations in healthcare utilization across different health facilities, especially between rural and urban areas. Cisse (2006) found that factors such as household leadership, education level, medication costs, income, and distance positively correlate with healthcare utilization in Cote D'Ivoire. These factors influence healthcare-seeking behavior among adolescent mothers, potentially leading to prenatal depression.

Healthcare-seeking behavior is inversely proportional to the distance to healthcare facilities. (Magadi et al. 2004) demonstrated in Kenya that increased distance to the nearest healthcare facilities is associated with fewer antenatal visits. Additionally, uncomfortable transport, poor road conditions, and difficulties in crossing large rivers have been identified as barriers to ANC utilization in Zimbabwe (Makii, 2015). (Minkovitz, et al., 2005), as cited by (Muriithi 2013), found that distance and user fees reduce demand for healthcare, with men being less constrained than women. The reviewed literature indicates a correlation between healthcare demand and adolescent mothers' behavior. However, it remains unclear whether these factors specifically influence prenatal depression among pregnant mothers, particularly adolescent mothers. This research aims to bridge this literature gap by examining the contribution of healthcare factors to prenatal depression.

2.5 Maternal factors associated among Adolescent Mothers

Antenatal care plays a crucial role in identifying potential pregnancy complications when initiated early and continued until childbirth. The World Health Organization advocates for a minimum of four antenatal care visits for each pregnancy. Unfortunately, data on antenatal care in Wajir County is unavailable. In the Northeastern region, where Wajir County is situated, only 37% of reproductive-age women receive antenatal care at least four times during pregnancy, significantly lower than the national rate of 58%. Delivery in a healthcare facility has been shown to reduce birth-related complications. However, in Wajir County, only around 18% of births occur in health facilities, contrasting starkly with the national rate of 61%. Access to obstetric care from trained professionals during delivery is crucial for reducing maternal and neonatal mortality rates. Yet, in Wajir County, merely 22% of births are attended by skilled birth attendants, compared to the national rate of 62%. Utilizing contraceptives to prevent unintended pregnancies can prevent

approximately 30% of maternal deaths and improve child survival rates. However, the utilization of modern contraceptive methods among currently married women aged 15-49 in Wajir County is alarmingly low, with only 2%, in contrast to the national rate of 53%. Additionally, the unmet need for contraceptives, which refers to the proportion of women desiring to avoid pregnancy but not using modern contraceptive methods, stands at approximately 20% among currently married women aged 15-49 in Wajir County, slightly exceeding the national rate of 17%.

2.6 Summary of Literature Review

After conducting a thorough literature review focusing on prenatal depression, it became evident that there is a scarcity of research addressing this issue, particularly concerning adolescent mothers in Africa. In Kenya, the available studies on prenatal depression are limited, indicating a lack of emphasis on this topic compared to postnatal depression in developing regions. The reviewed literature also revealed that in most developed countries, routine screening for prenatal depression is not standard practice. specifically, among adolescent mothers attending ANC clinics.

This research endeavors to contribute to the existing but limited body of evidence by examining socio-demographic factors, socio-cultural influences, and the impact of healthcare variables on prenatal depression among adolescent mothers receiving care at the antenatal clinic in Wajir County referral hospital, located in Wajir County, Kenya

By delving deeper into these aspects, this study aims to sheds light on the complex nature of prenatal depression among adolescent mothers within the distinct context of Wajir County. By investigating socio-demographic factors like age, education, and socio-economic status, the research aims to uncover potential risk factors linked to prenatal depression in this demographic. Furthermore, delving into socio-cultural influences will offer insights into how cultural norms, social support systems, and familial dynamics may influence the mental well-being of adolescent mothers during pregnancy.

Furthermore, the study will investigate the role of healthcare factors, including access to prenatal care, quality of healthcare services, and the presence of mental health screening protocols, in addressing prenatal depression among adolescent mothers. By addressing these various dimensions, the research endeavors to contribute valuable knowledge that this comprehensive analysis can guide the creation of tailored interventions and support mechanisms designed to alleviate the impact of prenatal depression in this susceptible population. By attaining a thorough comprehension of the factors contributing to prenatal depression among adolescent mothers,

healthcare providers and policymakers can work towards implementing more effective strategies to promote maternal mental well-being and improve outcomes for both mothers and their children.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

To identify factors linked with prenatal depression, a case-control study design conducted within a hospital setting was utilized. This selection was grounded on the design's appropriateness for probing rare outcomes, which could potentially be overlooked through random sampling. Although a population-based approach may seem optimal, the hospital-based design was selected for its convenience in recruiting adolescent pregnant mothers, encompassing both cases and controls, who were attending the antenatal clinic were included. Furthermore, to account for potential disparities in health-seeking behaviors between hospital-based and population-based controls, controls were deliberately recruited from the identical antenatal clinic as the cases. The study employed study design. This study designed, employed the comparing of different factors in numerical values to ascertain the variation in prevalence of depression as discussed in the findings. By adopting this approach, the study aimed to capture a comprehensive understanding of the factors contributing to prenatal depression among adolescent mothers within the hospital setting. This methodology allowed for a focused examination of variables that may influence the development of prenatal depression in this specific population. Additionally, by recruiting controls from the same antenatal clinic, the study sought to minimize potential biases that could arise from differences in health-seeking behaviors between cases and controls.

Furthermore, the hospital-based design facilitated efficient recruitment and data collection processes, ensuring the timely and thorough execution of the study. Despite the inherent limitations associated with this design, such as potential selection bias and limited generalizability to the broader population, it provided a pragmatic approach to investigating prenatal depression in a real-world clinical setting.

Overall, the utilization of a hospital-based case-control study design offered a practical and effective means of examining the factors associated with prenatal depression among adolescent mothers. Through rigorous data collection and analysis within the hospital context, the study aimed to generate valuable insights that could inform targeted interventions and support mechanisms for this vulnerable population.

3.2 Study Variables

The focal variable under scrutiny is prenatal depression, characterized by a binary distinction: either present or absent. Predictor variables encompass a spectrum of demographic attributes,

social connections, familial risk elements, and obstetric and pregnancy-related aspects. Demographic parameters encompass age, educational attainment, employment status, and marital status. Social network and familial considerations encapsulate the dimensions of social support and occurrences of domestic violence.

The inclusion of these predictor variables allows for a comprehensive exploration of the multifaceted factors that may contribute to prenatal depression among adolescent mothers. By examining demographic characteristics, such as age, education, occupation, and marital status, the study aims to uncover potential associations between these factors and the likelihood of experiencing prenatal depression.

Furthermore, the investigation into exploring social network and family-related factors, such as the presence of social support and occurrences of domestic violence, provides valuable insights into the interpersonal dynamics and support structures that could influence maternal mental health during pregnancy. Additionally, delving into obstetric and pregnancy-related factors offers a deeper understanding of how variables like gestational age, parity, and pregnancy complications may influence the risk of prenatal depression.

Moreover, the study explores various healthcare related factors such as policies, guidelines and health education campaigns, how they could influence the mental health during pregnancy. Pregnancy related factors offer a deeper understanding of how these variables my promote the risk of prenatal depression during pregnancy.

By exploring these diverse predictor variables, the study endeavors to identify key determinants of prenatal depression among adolescent mothers, thereby informing the development of targeted interventions and support services to mitigate the risk and burden of depression during pregnancy.

3.3 Location of the Study

The research was undertaken at Wajir County Referral Hospital, situated in Wajir County, Kenya. This facility stands as the sole county referral hospital catering to the entirety of Wajir County, located within Wajir East Constituency, near the Wajir police station. Spanning an area of approximately one acre, the hospital offers a comprehensive range of healthcare services, encompassing both outpatient and inpatient care, inclusive of preventive, curative, and rehabilitative interventions. Its infrastructure comprises six inpatient wards, with a collective bed capacity of 83, and experiences an average annual turnover of 8341 inpatients, as per the Wajir

Hospital Statistics of 2016. The average annual outpatient workload, catering to both adults and children, stands at around 6,700 visits.

Within the hospital premises, Essential Maternal Child Health (MCH) services serve as a cornerstone, encompassing a wide array of crucial interventions. These include the antenatal clinic services (ANC) encompass a wide array of provisions, including family planning services, child welfare and immunization services, and initiatives targeted at preventing mother-to-child transmission of HIV (PMTCT), alongside health education programs. Specifically, within the ANC clinic, an assortment of services is offered. These include health education sessions that promote healthy behaviors, comprehensive physical examinations of pregnant women, identification and management of pregnancy-related complications, concurrent illness detection and treatment, PMTCT services, reproductive health consultations, and a range of preventive interventions. These preventive measures encompass iron and folic acid supplementation, deworming protocols, tetanus toxoid immunizations, distribution of long-lasting insecticidal bed nets (LLIN), and administration of intermittent preventive treatment of malaria (IPTp).

Furthermore, the hospital's ANC clinic plays a pivotal role in delivering specialized care tailored to the unique needs of expectant mothers. Through comprehensive health education sessions, pregnant women are equipped with essential knowledge on maintaining their well-being and that of their unborn babies. Physical examinations conducted during ANC visits ensure early detection of any pregnancy-related complications, enabling timely intervention and management.

Additionally, the clinic offers a range of services aimed at safeguarding the reproductive health of expectant mothers, including consultations on family planning options and PMTCT services to prevent the transmission of HIV from mother to child. Moreover, preventive measures are prioritized within the ANC clinic to promote maternal and fetal health. These encompass the provision of essential supplements such as iron and folic acid, deworming medications, and tetanus toxoid immunizations to protect against tetanus infection. Furthermore, the distribution of long-lasting insecticidal bed nets helps prevent malaria transmission, while intermittent preventive treatment of malaria is administered to mitigate the risk of malaria infection during pregnancy. By offering a comprehensive array of maternal and child health services, the ANC clinic.

Additionally, the hospital's ANC clinic serves as a platform for empowering expectant mothers with the knowledge and skills needed to make informed decisions about their health and that of their infants. Through targeted health education sessions, pregnant women are educated on a wide range of topics, including nutrition, prenatal care, and infant care practices. This equips them with

the tools to navigate their pregnancy journey with confidence and promote the well-being of both themselves and their babies.

Furthermore, the ANC clinic offers comprehensive prenatal care services, including regular check-ups, screenings, and diagnostic tests to monitor the progress of pregnancy and detect any potential complications early on. This proactive approach enables healthcare providers to intervene promptly and effectively to ensure optimal outcomes for both mother and child. Moreover, the clinic provides a supportive and nurturing environment where expectant mothers can access counseling and emotional support to address any concerns or anxieties they may have during pregnancy. This holistic approach to care recognizes the importance of addressing the psychological and emotional well-being of pregnant women alongside their physical health needs. Overall, the ANC clinic at Wajir County Referral Hospital plays a vital role in promoting maternal and child health by offering comprehensive, compassionate, and evidence-based care to expectant mothers. Through its range of services and supportive environment, the clinic strives to empower women to have healthy pregnancies and positive birth experiences.

3.3.1 Case Definition

In this study, a case will be defined as an adolescent pregnant woman aged between 12 to 19 years, residing in the Wajir County region, and during the two-month study period, individuals attending the antenatal clinic at Wajir County Referral Hospital who demonstrated an Edinburgh Postnatal Depression Scale (EPDS) score of ≥13. The EPDS, a locally validated instrument, serves as a tool for identifying potential cases of both prenatal and postnatal depression. Its reliability and validity were assessed through 25 distinct studies conducted across various North and sub-Saharan African countries. Out of these studies, 16 utilized the EPDS, with an estimated internal consistency ranging from a median coefficient alpha of 0.84 to an interquartile range of 0.71-0.87. Therefore, the EPDS can effectively measure the severity of prenatal depression symptoms or screen for potential postnatal depression in African countries. While validation has been conducted in East Africa, specifically in Tanzania, it has not yet been completed in Kenya (Tsai, et al., 2013)

The EPDS scale consists of a list of questions comprising ten items, which assesses a woman's emotions and experiences over the preceding seven days using a Likert scale. Scores on the scale range from 0 to 30, with a score of ≥13 serving as the threshold indicating an elevated risk of depression, as established by (Cox, et al., 1987). Notably, the EPDS was not consistently administered within the ANC clinic setting. This absence of regular administration of the EPDS

within the ANC clinic may have implications for the identification and management of prenatal depression among pregnant women. Without regular screening using validated instruments like the EPDS, cases of prenatal depression may go undetected, potentially leading to underdiagnosis and inadequate support for affected women.

Furthermore, the lack of routine screening for prenatal depression within the ANC clinic may reflect broader challenges in mental health integration within maternal healthcare services. In many settings, mental health is still stigmatized or overlooked, resulting in limited resources and training for healthcare providers to address psychological issues such as depression during pregnancy.

Addressing these gaps in prenatal depression screening and management is crucial for ensuring comprehensive and holistic care for pregnant women. By integrating routine screening protocols for prenatal depression, healthcare providers can identify at-risk individuals early and provide timely interventions and support services to mitigate the impact of depression on maternal and child outcomes.

3.3.2 Control Definition

A control participant will be characterized as an adolescent mother-to-be, delineated in a manner akin to a case, albeit possessing an EPDS score falling below 13, as stipulated by (Cox, et al., 1987). These control participants will also be seeking antenatal care at Wajir County Referral Hospital concurrently with the cases.

These control participants serve as a comparison group to the cases, enabling a comprehensive examination of factors associated with prenatal depression among adolescent mothers. By including both cases and controls in the study, researchers can discern differences in demographic, social, and obstetric characteristics between those with elevated EPDS scores indicative of depression and those with lower scores.

Furthermore, the inclusion of control participants enhances the validity and reliability of the study findings by allowing for comparisons and statistical analyses to identify significant associations and risk factors for prenatal depression. This approach contributes to a more nuanced understanding of the complex interplay of factors influencing maternal mental health during pregnancy.

Ultimately, the involvement of both cases and controls in the study design enriches the research process and strengthens the evidence base for developing targeted interventions and support

services aimed at mitigating the burden of prenatal depression among adolescent mothers attending antenatal clinics.

3.4 Study Population

The study cohort will consist of adolescent expectant mothers aged between 12 and 19 years who regularly visit the antenatal clinic at Wajir County Referral Hospital throughout the three-month data collection phase. In Kenya, pregnant adolescents are considered emancipated minors, thus possessing legal consent authority. Both cases (159) and controls (115) will be chosen from mothers aged between 12 and 19 years.

This selection criteria ensures that the study captures a representative sample of adolescent pregnant women seeking antenatal care at the hospital, allowing for a comprehensive examination of factors related to prenatal depression within this population. By including both cases, with EPDS scores indicating potential depression, and controls, with lower EPDS scores, the study aims to elucidate the determinants and risk factors associated with prenatal depression among adolescent mothers.

Moreover, focusing on adolescent pregnant women aged 12 to 19 years acknowledges the unique challenges and vulnerabilities faced by this demographic group during pregnancy. By specifically targeting this age range, the study can tailor interventions and support services to address the distinct needs of adolescent mothers, thereby enhancing Outcomes related to the health of both mothers and children in this population.

Overall, the inclusion of adolescent pregnant women attending the antenatal clinic at Wajir County Referral Hospital ensures the relevance and applicability of the study findings to the local context, facilitating the development of targeted interventions to address prenatal depression in this setting.

3.5 Sampling Techniques and Sample Size Determination

3.5.1 Sampling Techniques

The study will distribute the EPDS scale to every woman visiting the ANC clinic, assessing their prenatal depression status. Prospective recruitment of cases will occur for all women meeting the specified case definition outlined in section 3.3.1 until the predetermined number of cases is attained. Controls, delineated as women devoid of prenatal depression as delineated in section 3.3.2, will be chosen randomly from attendees of the ANC clinic at Wajir County Referral Hospital on the same recruitment day as the cases.

This methodical approach ensures the inclusion of both cases, exemplifying women with prenatal depression, and controls, representing those without prenatal depression, within the study cohort. Through employing a random sampling technique to select controls from the identical population pool as the cases, the study endeavors to mitigate selection bias and bolster the validity of the findings. Moreover, administering the EPDS scale to all women attending the ANC clinic allows for comprehensive screening of prenatal depression among the study population. This standardized screening process enables the identification of cases based on established criteria, ensuring consistency and accuracy in case selection.

Overall, the meticulous recruitment strategy adopted by the study facilitates the collection of robust data necessary, to explore the factors linked to prenatal depression among adolescent mothers comprehensively, this study incorporates both cases and controls. The objective is to furnish invaluable insights into the drivers of prenatal depression, thereby guiding the formulation of tailored interventions to bolster maternal mental well-being within this susceptible demographic.

3.5.2 Sample Size Determination

The size of the sample calculated shall reduce the cost and time for research studies while at the same time ensuring representativeness. Since this was a controlled study and the main variable for analysis is Odds Ratio (OR), 159 cases and 115 controls. The sample size was estimated by Methods in Observational Epidemiology 2nd Edition as illustrated by Kelsey et al. 1996.

$$n = \frac{Z \times Z \times P(1-P)}{E \times E}$$

$$\frac{1.96 \times 1.96 \times 0.8827(1-0.8827)}{0.05 \times 0.05}$$

$$= 159$$

3.5.3 Sampling procedure

This study employed a hospital-based study design where convenience of recruiting expectant mothers (cases and controls) who visit the antenatal clinic for care was chosen. Two registered nurses working as hospital research assistants who have prior training in interviewing methods conducted the participant enrollment and interviews. Patients' informed consent was sought, the Edinburgh Postnatal Depression Scale (EPDS) was given via a face-to-face interview in a private

room within the ANC clinic (either the English, Kiswahili, or local dialect, based on the person's option). Just before provided routine ANC services, the EPDS tool was completed. Pregnant women in Wajir County who were between 12 and 19 years old, attending regular ANC, and who were willing to take part in the study formed study's sample. As a result of the comparable high number of controls, random selection and matching of frequency based on the age of the respondents at the presentation time.

3.5.4 Criteria for inclusion and exclusion

Criteria for Inclusion

- Mothers or caregivers who have children less than five years of age and have been resident in Wajir town for at least 6 months.

Exclusion Criteria

- Mothers/caregivers of children of less than five years of age, who are visitors to the households.

3.6 Construction of Research Instrument

3.6.1 Questionnaire

A meticulously structured questionnaire served as the primary tool for data collection in this research endeavor, comprising predominantly closed-ended inquiries. This questionnaire was meticulously designed to cover diverse domains, this encompassed demographic characteristics, social network and family risk factors, and obstetrics and pregnancy-related factors. Demographic inquiries encompassed diverse aspects, including age, educational level, occupation, and marital status. Social network and family-related factors delved into matters concerning social support and occurrences of domestic violence.

The chosen questionnaire was deemed highly appropriate for the study, owing to its ability to efficiently gather a vast array of information within a relatively short period. Particularly in the realm of social sciences, the use of a questionnaire offered significant advantages due to its simplicity in analysis, ease of administration, and cost-effectiveness. The inclusion of predominantly closed-ended questions further facilitated streamlined data analysis processes, thus optimizing resource utilization in terms of both time and financial expenditure.

Additionally, the meticulous crafting of the questionnaire ensured that it was tailored to the specific objectives of the research, thereby enhancing its relevance and effectiveness in capturing the

necessary data. Each question was carefully constructed to elicit precise responses, minimizing ambiguity and maximizing the accuracy of the collected information.

Furthermore, the structured format of the questionnaire provided consistency in data collection, allowing for comparability across different respondents and facilitating the identification of patterns and trends within the data. This standardized approach contributed to the reliability and validity of the research findings.

Moreover, the use of closed-ended questions offered a level of simplicity that encouraged higher response rates from participants, reducing the likelihood of incomplete or missing data. This approach also simplified the data entry and analysis processes, expediting the generation of results and conclusions. Overall, the meticulous design and implementation of the questionnaire played a pivotal role in the success of the research endeavor, enabling the efficient collection of comprehensive data that could be analyzed to derive meaningful insights and contribute to the advancement of knowledge in the field.

3.6.2 Questionnaire Pre-test

Before commencing the main study, a pre-test was conducted involving 24 respondents who were not part of the main study. The procedures used for pre-testing were identical to those planned for the main study or data collection. Pre-testing was a crucial exercise aimed at aiding information gathering, thereby facilitating the testing of reliability and validity of the research instruments. This involved administering the questionnaires to women at Wajir County hospital, using language they could easily understand. The responses and comments provided were then utilized to enhance the instruments by making necessary adjustments.

3.6.3 Validity of the Research Instruments

As per the insights provided by Mugenda & Mugenda (2003), validity refers to the accuracy and meaningfulness of inferences drawn from research findings. The questionnaire items designated for data collection underwent rigorous scrutiny for both face and content validity. To ensure validity, the researcher relied on the expertise of subject matter specialists who scrutinized the questionnaire items, suggesting alterations were deemed necessary. This approach not only augmented the content validity of the instruments but also aided the researcher in maintaining focus on the study's objectives. Furthermore, the questionnaire items were aligned with the research inquiries and the specific aims of the study.

This meticulous process of alignment ensured that the questionnaire items resonated effectively with the research questions and served the specific objectives of the study. By adhering to these rigorous standards, the researcher sought to enhance the overall robustness and integrity of the research findings. Additionally, the involvement of subject experts not only bolstered the credibility of the research but also fostered a collaborative approach towards refining the data collection instruments. In essence, the emphasis on validity underscored the commitment to producing reliable and meaningful insights that could withstand scrutiny and adds to the body of knowledge in the respective field of study.

3.6.4 Reliability of the Research Instruments

To ensure the reliability of the instruments, the test-retest technique was employed, involving the collection of data from the same group of respondents on two separate occasions at Camel Medical Centre in Wajir town. The second test was conducted two weeks after the initial one. Twenty-four identical respondents participated in both tests, and a comparison was made between the results obtained from the two administrations. The Spearman correlation coefficient was utilized to calculate the reliability of the instruments. A correlation coefficient of 0.8 was deemed sufficiently reliable to assess the reliability of the instrument.

3.7 Data Collection Techniques

The process of participant recruitment was overseen by a duo of research assistants stationed at hospitals. These assistants underwent comprehensive training sessions conducted by the researcher, focusing on the study's content, the training encompassed thorough instruction on the proper administration of the EPDS scale, ethical considerations, and the accurate completion of the pretested questionnaire. The primary objective of this training was to ensure adherence to the study's objectives and to mitigate potential deviations during the data collection process.

Data collection occurred during the morning hours, aligning with the peak attendance of pregnant women at ANC clinics, typically between 9 am and 1 pm. Verification of pregnancy status was conducted by research assistants, who cross-referenced the woman's ANC booklet for supporting evidence, such as a positive PDT test or ultrasound result.

Prior to soliciting consent, the research assistant provided detailed information regarding eligibility criteria, the purpose of the study, and the procedures involved. Mothers who willingly consented to participate underwent administration of the EPDS to assess their depression status.

Subsequently, both cases and controls were administered a predetermined questionnaire to ascertain their respective exposures.

To maintain a balanced study design, a maximum of two controls were selected for each case. This meticulous approach aimed to ensure equitable representation across the study groups and bolster the validity of the research outcomes.

This rigorous methodology not only facilitated the collection of comprehensive data but also instilled confidence in the research process. By adhering to standardized procedures and providing thorough training to the research assistants, the researcher sought to uphold the integrity of the study and minimize potential biases.

Furthermore, the emphasis on obtaining informed consent and providing detailed information to participants underscored the ethical considerations inherent in the research endeavor. This transparent approach aimed to foster trust and cooperation among the study participants, thereby enhancing the overall quality of the data collected.

By accurately following these protocols, the researcher aimed to mitigate any potential sources of error and ensure the reliability and validity of the study findings. This commitment to methodological rigor served as a cornerstone for generating meaningful insights that could contribute to the advancement of knowledge in the field of maternal health and depression during pregnancy.

3.8 Data Processing and Analysis.

Data collected through electronic based tablet Pcs was checked for correctness and double entries. The dataset was processed using for both data cleaning and analysis, Stata software version 13.0 was utilized. Descriptive statistics, such as means and medians, were employed to summarize data pertaining to continuous variables. Moreover, proportions and percentages were utilized to generate descriptive data for categorical variables.

Odds ratio was determined the reference was used to describe the data and to explain the relationship between variables (Statistics solutions, 2012). It's noteworthy that non-significant variables in the case-control study were excluded from the model only if their removal didn't result in a regression coefficient alteration exceeding 30% in the remaining variables (Mirieri, 2019). A two-way interaction between the remaining variables in the final model and their significance were incorporated within a case-control framework. The adequacy of the model's fit to the case-control

data was assessed using the Hosmer-Lemeshow goodness of fit test, where a p-value of >0.05 signified a satisfactory fit.

3.9 Logistical and Ethical Considerations.

The researcher commenced the procedure for acquiring ethical clearance to conduct the research via the Mount Kenya University (MKU) Graduate School. Following this, clearance was sought from the National Commission for Science, Technology, and Innovation (NACOSTI). Furthermore, authorization from the Wajir County Department of Public Health was secured prior to the commencement of data collection.

Participation in the study was entirely voluntary, with participants assured of their autonomy and freedom from any form of coercion or inducement. Comprehensive explanations regarding All participants were apprised of the purpose and nature of the research. Any queries posed by the participants were duly attended to, and informed consent was obtained prior to the initiation of the study.

Particular attention was given to women under the age of 18, who were sensitized to the significance of the study in addressing their specific concerns. They were encouraged to articulate their perspectives based on the unique challenges they encountered in their immediate environment.

To safeguard confidentiality, the researcher-administered questionnaires refrained from including respondents' personal information, with participants solely identified by a designated study identification number. The study abstained from engaging in any experimental procedures with the respondents, and no specimens were solicited from the participants. All gathered data were securely stored under strict lock and key to limit access. Participants retained the prerogative to withdraw from the study at any juncture, devoid of any adverse consequences. Financial remuneration for participation in the study was not offered. Furthermore, the study offered a support mechanism for participants identified as depressed by referring them to medical counseling and psychosocial support services at the Wajir County Referral Psychological Counseling Center, located within the Wajir County Referral Hospital in Kenya.

This comprehensive approach to ethical considerations underscored the researcher's commitment to upholding the rights and well-being of the study participants. By obtaining clearance from relevant authorities and ensuring voluntary participation, the researcher aimed to maintain the integrity and credibility of the research process. Moreover, the provision of specialized attention

to vulnerable groups, such as young women, demonstrated a dedication to inclusivity and sensitivity to their unique circumstances. By empowering participants to voice their concerns and experiences, the study aimed to generate insights that accurately reflected the diverse perspectives within the community.

The strict protocols implemented to safeguard confidentiality and data security further reinforced the trustworthiness of the study. Participants' ability to withdraw from the study at any point without consequence emphasized respect for their autonomy and agency.

Additionally, the provision of support services for participants identified as depressed exemplified a commitment to not only collecting data but also addressing the holistic well-being of the individuals involved. This proactive approach reflected a broader ethical responsibility towards the welfare of the community. In summary, the meticulous adherence to ethical guidelines and the proactive measures implemented throughout the research process underscored a commitment to conducting research that was not only scientifically rigorous but also socially responsible and beneficial to the participants and the broader community.

CHAPTER FOUR: FINDINGS AND DISCUSSION

4.1 Introduction

Data analysis, presentation and interpretation are crucial components of research that enables researchers to draw meaningful conclusions from the collected data. In this chapter, we discussed the presentation and interpretation of findings from the data collected in our study.

Respondents Demographics Characteristics

The study sought to determine the respondents' demographic characteristics such as age, level of education attained, occupation, religion, and marital status. The results are presented below.

The **figure 2** shows that majority of the respondents are aged between 19-21 years 29%, 15-18 years 24%, and 22-24 years 17%. This implies that most pregnant women are above the consent age of 18 years.

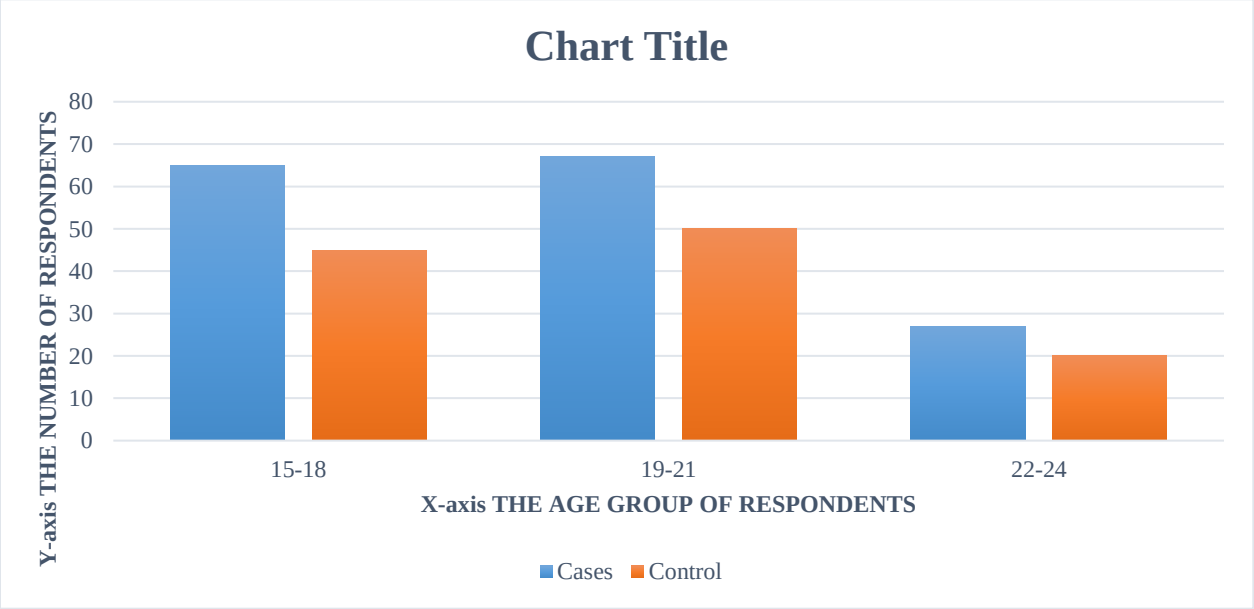


Figure 2 Age Distribution Between Cases of the Respondent and Control Graph

The **table 1** shows that majority of the respondents did not attend school at 39%. Those who have attended secondary school account for 23% while those with only primary school education account for 33%.

Table 1Highest Level of education attended by the respondents and their control.

Level	Cases	Control
Primary	52(32.7%)	32
Secondary	36(22.6%)	32
Tertiary	9(6.7%)	5
Did not attend school	62(38.9%)	42
Total	159(100%)	115

The table 2 below indicates that majority of the adolescent mothers are housewife accounting for 84% of the respondents. 11% are businesswomen while 4% are farmers. All the respondents 159 (100%) were married. Islam religion accounted for 100% of the respondents.

Table 2 Respondents Occupation and their control

Occupation	Cases	Control
Housewife	133(83.6%)	102
Cleaner	1(0.6%)	0
Farmer	7(4.4%)	5
Businesswomen	18(11.3%)	8
Total	159(100%)	115

4.2 Prevalence of Prenatal Depression among Adolescent Mothers

This session presents data on research question number one, what is the prevalence of prenatal depression among adolescent mothers attending the antenatal clinic at Wajir County referral hospital? The women who met the criteria for depression using EPDS scale were 53 from the total sample simple size of 159. This gives a prevalence of prenatal depression of 33% among adolescent mothers attending ANC at Wajir county referral hospital. Among the 53 mothers who were affected by depression. The total number of depressed women between the age of 15 to 18 were 33 against the number of screened women in the said category.

Therefore, the Prevalence of depression in the age group between 15 to 18 is.

$$Prevalence = \frac{Number\ of\ depressedwomen}{Total\ number\ of\ screened\ women} \times 100\%$$

$$\frac{33}{65} \times 100\%$$

50.8%

The total number of depressed women between the age of 19 to 21 were 12 against the number of screened women in the said category. Therefore, the Prevalence of depression in the age group between 19 to 21 is.

$$Prevalence = \frac{Number\ of\ depressedwomen}{Total\ number\ of\ screened\ women} \times 100\%$$

$$\frac{12}{67} \times 100\%$$

17.9%

The total number of depressed women between the age of 22 to 24 were 8 against the number of screened women in the said category. Therefore, the Prevalence of depression in the age group between 22 to 24 is;

$$Prevalence = \frac{Number\ of\ depressedwomen}{Total\ number\ of\ screened\ women} \times 100\%$$

$$\frac{8}{27} \times 100\%$$

29.6%

The overall Prevalence was

$$Prevalence = \frac{Total\ Number\ of\ depressed\ women}{Total\ number\ of\ screened\ women} \times 100\%$$

$$\frac{53}{159} \times 100\%$$

33.3%

From the **table 3** below, the OR for age group 19-21 is 4.7. This implies the age group 15-18 4.7 times more likely to have prenatal depression as compared to 19-21 and 2.4 more likely to have depression as compared to the age group 22-24. The young age 15-18 are more affected than the other age groups.

Table 3 Association of Age and Prenatal Depression

Exposure Age	Outcome (Dependent variables)				
	Cases (Depression)	Non-Cases (No Depression)	Total	Prenatal Depression	OR
15-18	33	32	65	50.9	Reference
19-21	12	55	67	17.9	4.7
22-24	8	19	27	29.6	2.4
Total	53	106	159		

From the table 4 below, the OR of the housewife as compared to the women (Businesswomen, farmer and cleaner) is below 1. This means adolescent housewife are less likely to suffer from prenatal depression as compared to other adolescent pregnant women. The housewives are less likely to suffer depression because they have nothing to worry as they are provided everything with their husbands.

Table 4 The Association of occupation with Prenatal Depression

Exposure Occupation	Outcome (Dependent variables)				
	Cases (Depression)	Non-Cases (No Depression)	Total	Prenatal Depression	OR
Housewife	5	44	49	10.2%	Reference
Businesswomen	16	33	49	32.7%	0.23
Farmers	14	20	34	41.1%	0.016
Cleaners	18	9	27	66.7%	0.06
Total	53	106	159		

The table 5 below, the Odd Ratio is 0.15. It is evident that the married mothers are less likely to suffer from prenatal depression.

The study shows that family pressures had been the reason for engaging in early marriage with 39% strongly agreeing and 25% agreeing. Most of the respondents were forced into unplanned pregnancy, 13% strongly agreeing and 24% agreeing. Most of the respondents wanted to continue with school but could not because they had entered marriage with 28% who agreed on the

statement. Majority of the respondents' have no one to turn to for guidance in times of stress as illustrated with respondents who agreed on that statement.

The respondents indicated the need for education and amendments of socio cultural believes which limit their accessibility to healthcare centers 37% strongly agree and 35% agreeing. Most of them believe that social-cultural knowledge and interpretations limit the need to access available health facilities. The respondents indicated the need for education on the social-cultural knowledge and interpretations which limit their accessibility to healthcare centers. Majority of the respondents strongly agreed 37% that there are negative cultural aspects of prenatal care among adolescent women and were seconded with 35% 0f there respondents agreeing.

Majority of the respondents had family that provided support and guidance with 34% strongly agreeing and 27% agreeing and 37% at neutral stand. 40% of the entire populations strongly agreed that they are more like advised to use available tradition medication as opposed to the 6.3% strongly disagreeing. It was noted that husbands are excluded from prenatal care education with 43% strongly agreeing and seconded by 29% agreeing. Barriers such as limited access to resources and social exclusions are common am adolescent women with 44% strongly agreeing and 25% agreeing.

Table 5 The Association of marital status with Prenatal Depression

Marital status	**Outcome (Dependent variables)**				
	Cases (Depression)	**Non-Cases (No Depression)**	**Total**	**Prenatal Depression**	**OR**
Single	0	0	0	0%	Reference
Married	5	44	49	10.2%	4.7
Divorced/ Widow/ Separated	48	62	110	43.6%	2.4
Total	**53**	**106**	**159**		

4.3 Maternal Factors Associated Prenatal Depression among teenage Pregnant Mothers

From the table 6 below, the OR is 4.7. This means that an adolescent woman with complications are 4.7 times more likely to have prenatal depression as compared to an adolescent with no obstetric complication.

Table 6 The Association Pregnancy and Effects with Prenatal depression

Exposure pregnancy complication	Outcome (Dependent variables)			
	Cases (Depression)	Non-Cases (No Depression)	Total	OR
Yes	40(52.6%)	36	76	Reference
No	13(15.7%)	70	83	4.7
Total	53(33.3%)	106	159	

From the table 7 below, the OR is 3. This means that an adolescent woman without prenatal checkups complications are 3 times more likely to have prenatal depression as compared to an adolescent with knowledge and exposure to the checkups.

Table 7 The Association of Prenatal Checkup with the Prevalence of Prenatal depression

Exposure Prenatal Knowledge	Outcome (Dependent variables)			
	Cases (Depression)	Non-Cases (No Depression)	Total	OR
Yes	50	36	86	Reference
No	23	50	73	3.0
Total	53	76	159	

The table 8 below, the Odd Ratio is 0.04. It is evident that the adolescent mothers who plan for their pregnancies are less likely to suffer from prenatal depression.

Table 8The Association of Planned with Prenatal Depression

Exposure Planned Pregnancy	Outcome (Dependent variables)			
	Cases (Depression)	Non-Cases (No Depression)	Total	OR
Yes	46	59	105	Reference
No	34	20	54	0.04
Total	80	79	159	

The table 9 below, shows that majority of the respondents are in a relationship currently. However, majority have never been in an intimate adult relationship since most of them were wedded at an early age. Most of the respondents' have never been afraid of ant partner they have had, and most are currently not afraid the partner they have.

Table 9 The Association of Relationship status with Prenatal Depression

Relationship Status and Situation					
Status	**Yes**		**No**		**Total**
Are you currently in a relationship?	105	66.03774	54	33.96	159
Are you currently afraid of your partner?	37	23.27044	122	76.72	159
Have you ever been in an adult intimate relationship? (Since you were 12 years of age)	55	34.59119	104	65.40	159
Have you ever been afraid of any partner?	34	21.38365	125	78.61	159

4.4 Association of Health Care Factors with Prenatal Depression amongst teenage Pregnant Mothers

This section seeks to answer the fourth research question: What are the health care systems associated with burden of prenatal depression among adolescent mothers attending the antenatal clinic at Wajir County referral hospital, Kenya?

From the Table 10 below it can be established that majority of the respondents agree that there is poor government provision and utilization of antenatal care services (strongly agree (56%) and agree (26%). Most of the respondents also agree that there is an increasing number of adolescent depression and mental health burden in the community. The respondents agree that medical staff are not friendly when it comes to handling adolescent pregnant women. Majority of the respondents strongly agree that the health facility is far from their homes making it a challenge to access basic health services. In the community most of the respondents attribute poor security on the way demoralizes search for hospital-based care also they agree that insufficient personnel to sensitize on emotional, psychosocial, health, and educational problems in the lives of vulnerable pregnant adolescents lacks in Wajir County hospital.

The results are shown in the table below:

Table 10 Association of Health Care Factors with Prenatal Depression amongst teenage Pregnant Mothers

Health Care Factors Causing Prenatal Depression amongst teenage Pregnant Mothers					
Factor	**SA**	**A**	**N**	**D**	**SD**
There is poor government provision and utilization of antenatal care services	89(56%)	41	14	12	3
Increasing number of adolescent depression and mental health burden	73(46%)	63	14	8	1
Staff are not friendly when it comes to handling adolescent pregnant women	58(36%)	55	35	9	2
Facility is far from her home so is it a challenge to access basic health services	59(37%)	53	32	14	1
Poor security is on the way demoralizes search for hospital-based care	46	59(37%)	35	14	5
Insufficient personnel to sensitize on emotional, psychosocial, health, and educational problems in the lives of vulnerable pregnant adolescents	78(	60(47%)	9	10	2

4.5 DISCUSSION OF RESULTS

Objective i: Prevalence of Prenatal Depression The study found that 33.3% of adolescent mothers attending the antenatal care clinic at Wajir County Referral Hospital experienced prenatal depression. This prevalence sheds light on the magnitude of the issue, emphasizing the need for targeted interventions and support systems for this vulnerable population.

Objective ii: Socio-cultural Factors Socio-cultural factors significantly contribute to prenatal depression among adolescent mothers. Findings indicate that factors such as traditional norms, social stigma, and lack of social support play a pivotal role. Culturally sensitive interventions and community-based programs are essential to address and alleviate these factors.

Objective iii: Maternal Factors Maternal factors emerged as strong predictors of prenatal depression. Age, educational level, marital status, and financial status were identified as key contributors. Targeted interventions focusing on improving education, economic empowerment,

and social support structures for adolescent mothers are recommended to mitigate the impact of these factors.

Objective iv: Health Care Factors Health care-related factors were found to influence the prevalence of prenatal depression among adolescent mothers. Barriers to accessing quality antenatal care services, lack of mental health screening, and limited awareness contribute to the burden of depression.

Integrating mental health screening into routine antenatal care and enhancing healthcare accessibility are crucial recommendations for addressing these factors.

CHAPTER 5: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

The present study delved into investigating the factors contributing to the prevalence of prenatal depression among adolescent mothers seeking antenatal care at Wajir County Referral Hospital, Wajir County, Kenya. Through an in-depth exploration of the experiences and challenges faced by pregnant adolescents, this research has shed light on the prevalence and effects of prenatal depression in this vulnerable population.

5.1 Summary of Findings

This study aimed to comprehensively investigate factors contributing to the prevalence of prenatal depression among adolescent mothers attending antenatal care at Wajir County Referral Hospital, Kenya.

I. **Objective i:** To determine the prevalence of prenatal depression among adolescent mothers attending the antenatal care clinic at Wajir County Referral Hospital, Kenya, a comprehensive study was conducted. The findings from this study unveiled a considerable prevalence of prenatal depression among adolescent mothers accessing antenatal care services at the hospital. Through quantitative evaluations, it was observed that a substantial proportion of participants exhibited symptoms suggestive of prenatal depression, with a prevalence rate recorded at 33.3%.

   This prevalence rate underscores the significance of addressing prenatal depression among adolescent mothers, highlighting the need for targeted interventions and support services within the antenatal care setting. By identifying and acknowledging the prevalence of this mental health issue, healthcare providers can better tailor their approaches to meet the specific needs of this vulnerable population.

   Moreover, the study's findings shed light on the importance of early detection and intervention strategies to mitigate the adverse effects of prenatal depression on both maternal and child health outcomes. By implementing screening protocols and providing appropriate psychosocial support, healthcare professionals can play a crucial role in promoting the well-being of adolescent mothers and their offspring.

   Furthermore, these findings contribute to the growing body of literature on maternal mental health in resource-constrained settings, providing valuable insights into the prevalence and impact of prenatal depression among adolescent populations in similar contexts. This

knowledge can inform future research endeavors and guide the development of evidence-based interventions aimed at improving maternal and child health outcomes in underserved communities.

II. **Objective ii:** To explore the socio-cultural determinants linked to the prevalence of prenatal depression among adolescent mothers receiving care at the antenatal clinic in Wajir County referral hospital, Kenya, a comprehensive investigation was conducted. The results underscored the influential role of socio-cultural factors in shaping the occurrence of prenatal depression. Specifically, the findings illuminated the profound effects of social stigma, entrenched cultural norms, and insufficient social support networks on the mental health status of adolescent mothers.

These socio-cultural dynamics are crucial considerations in understanding the complex interplay between cultural contexts and mental health outcomes among adolescent mothers. The study's findings highlight the need for targeted interventions that address not only the individual symptoms of prenatal depression but also the broader socio-cultural factors that contribute to its prevalence.

By recognizing and addressing these underlying determinants, healthcare providers can better tailor their approaches to support adolescent mothers in navigating the challenges they face during pregnancy. This holistic approach to care acknowledges the multifaceted nature of prenatal depression and emphasizes the importance of culturally sensitive and contextually relevant interventions.

Furthermore, the insights gleaned from this study contribute to the broader discourse on maternal mental health in diverse cultural settings. By shedding light on the socio-cultural factors that influence prenatal depression, the study provides valuable knowledge that can inform policymaking and intervention strategies aimed at promoting maternal well-being in similar contexts globally.

III. **Objective iii:** To ascertain the maternal factors linked to the prevalence of prenatal depression among adolescent mothers seeking care at the ANC clinic in Wajir County referral hospital, a comprehensive investigation was undertaken. The analysis revealed that maternal factors, including age, educational background, and socioeconomic status, played significant roles in influencing the occurrence of prenatal depression. Notably, younger maternal age and lower levels of educational attainment were identified as key factors contributing to heightened susceptibility to prenatal depression.

These findings underscore the importance of considering maternal characteristics when assessing the risk of prenatal depression among adolescent mothers. By understanding how age, education, and socioeconomic status intersect with mental health outcomes, healthcare providers can better tailor interventions to address the specific needs of this vulnerable population.

Moreover, the identification of these maternal factors provides valuable insights for developing targeted prevention and intervention strategies. By addressing underlying socioeconomic disparities and providing support tailored to the unique circumstances of adolescent mothers, healthcare professionals can mitigate the risk of prenatal depression and promote overall maternal well-being.

Furthermore, these findings contribute to the broader body of research on maternal mental health, highlighting the nuanced interplay between maternal characteristics and mental health outcomes during pregnancy. By recognizing the complex array of factors influencing prenatal depression, healthcare providers can adopt a more holistic approach to care that addresses both individual and structural determinants of mental health.

IV. **Objective iv:** In order to investigate the healthcare factors linked to the prevalence of prenatal depression among adolescent mothers accessing the antenatal clinic at Wajir County referral hospital, a thorough examination was conducted. Health care factors, encompassing aspects such as the quality of antenatal care services, emerged as pivotal determinants impacting prenatal depression. Notably, deficiencies in the integration of mental health services within antenatal care were found to correlate with a heightened prevalence of prenatal depression among adolescent mothers.

These findings highlight the crucial role of healthcare services in addressing the mental health needs of adolescent mothers during pregnancy. By ensuring the integration of comprehensive mental health support within antenatal care settings, healthcare providers can effectively identify and address prenatal depression among this vulnerable population. Furthermore, the identification of healthcare factors associated with prenatal depression underscores the importance of holistic approaches to maternal care. By addressing systemic barriers and enhancing the quality of antenatal services, healthcare systems can better meet the diverse needs of adolescent mothers and promote positive maternal mental health outcomes.

Additionally, these findings contribute to the broader discourse on mental health integration within maternal healthcare services. By highlighting the impact of inadequate mental health integration on prenatal depression prevalence, this research emphasizes the need for policy initiatives and healthcare reforms aimed at improving mental health access and support for pregnant adolescents.

5.2 Conclusion

The following conclusions are drawn from the investigation of socio-cultural, maternal, and healthcare factors.

I. The study revealed a significant prevalence of prenatal depression among adolescent mothers in the antenatal care clinic at Wajir County Referral Hospital. Routine screening for prenatal depression is crucial to early identification and intervention.

II. Social stigma, cultural norms, and the lack of support networks emerged as critical socio-cultural factors influencing prenatal depression. Community-based awareness campaigns and support initiatives are imperative to address these challenges.

III. Maternal factors, including age, educational background, and socioeconomic status, were identified as determinants of prenatal depression. Targeted interventions and educational programs within the ANC setting are recommended for vulnerable groups.

IV. Health care factors, notably the quality of antenatal care services and the integration of mental health support, significantly influenced prenatal depression. Enhancing mental health training for healthcare providers and advocating for improved resources in the ANC setting is essential.

Comparison to National Prevalences the overall prevalence of prenatal depression among adolescent mothers is between 13-18.7% and that of Wajir stands at 33% which is higher as compared to national prevalence due to high poverty levels and community norms which undermines the rights of pregnant girls.

Wajir county is also a marginalized county with low resources and high illiteracy level which is a key contributor to this prevalence level

The study underscores the complex interplay of factors contributing to prenatal depression among adolescent mothers in Wajir County. A holistic approach that combines routine screening,

community engagement, targeted interventions, and improved healthcare services is necessary to address the multifaceted challenges faced by this vulnerable population. The findings provide valuable insights for policymakers, healthcare providers, and community stakeholders working towards the enhancement of maternal mental health in similar contexts.

5.3 Recommendations

In light of the findings regarding the prevalence of prenatal depression among adolescent mothers attending antenatal care at Wajir County Referral Hospital, the following recommendations are proposed to address socio-cultural, maternal, and healthcare factors influencing mental well-being.

I. The county health committee to Implement routine screening protocols for prenatal depression during antenatal care visits. Integrate mental health assessments into existing ANC services to identify and address symptoms early on.

II. County Ministry of health to develop community-based awareness campaigns to combat social stigma surrounding adolescent pregnancy. Establish support networks within the community to enhance the emotional well-being of adolescent mothers.

III. The national government to Initiate targeted interventions for younger mothers and those with lower educational backgrounds. Implement educational programs within the ANC setting to empower adolescent mothers with coping strategies and resources.

IV. The Ministry of health in conjunction of county health board to enhance mental health training for healthcare providers involved in antenatal care. Advocate for the integration of mental health services within the ANC setting, ensuring that adequate resources and support are available for adolescent mothers.

6.0 REFERENCES

Abuidhail, J., & Abujilban, S. (2014). Characteristics of Jordanian depressed pregnant women: A comparison study: Antenatal depression. *J. Psychiatr. Ment. Health Nurs. 21*, , 573-579.

Adewuya, A., Ola, B., Aloba, O., Dada, A., & Fasoto, O. (2017). Prevalence and correlates of depression in late pregnancy among Nigerian women. *Depress. Anxiety 24*, 15-21.

Ajinkya, S. J. (2013a). Depression during pregnancy: Prevalence and obstetric risk factors among pregnant women attending a tertiary care hospital in Navi Mumbai. *Ind. Psychiatry J. 22*, 37-40.

Ali, N., Azam, I., Ali, B., Tabbusum, G., & Moin, S. (2012). Frequency and Associated Factors for Anxiety and Depression in Pregnant Women: A Hospital-Based Cross-sectional study. *Scientific World Journal 2012*.

Amorim, P. (2000). Mini International Neuropsychiatric Interview (MINI) . *Rev. Bras. Psiquiatr 22*, 106-115.

Babu, G., Murthy, G., Singh, N., Nath, A., Rathnaiah, M., Saldanha, N., . . . Kinra, S. (2018). Socio demographic and Medical Risk Factors Associated with Antepartum Depression. *Front. Public Health 6*.

Bawahab, J., Alahmadi, J., & Ibrahim, A. (2017). Prevalence and determinants of antenatal depression among women attending primary health care centers in Western Saudi Arabia. *Saudi Med. J. 38*, 1237-1242.

Beck, A. T., Ward, C., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for Measuring Depression. *Arch. Gen. Psychiatry 4,*, 561-571.

Bennet, H. A., Einarson, A., Taddio, A., Koren, G., & Einarson, T. R. (2004a). Prevalence of depression during pregnancy: systematic review. *Obstet. Gynecol. 103,*, 698-709.

Bhat, N. A., Hassam, R., Shafiq, M., & Sheikh, S. (2015). Sociodemographic factors: A major predictor of anxiety and depression among pregnant women,. *Delhi psychiatry Journal 2015; 18(1).*

Biaggi, A., Conroy, S., Pawlby, S., & Pariante, C. (2016a). Identifying the women at risk of antenatal anxiety and depression: Asystemic review. *J. Affect. Disord. 191*, 62-77.

Biratu, A., & Haile, D. (2015). Prevalence of antenatal depression and associated factors among pregnant women in Addis Ababa, Ethiopia: a cross-sectional study. *Reprod. Health 12*, 99.

Bodecs, T., Szilagyi, E., Cholnoky, P., Sandor, J., Gonda, X., Rihmer, Z., & Horvath, B. (2013). Prevalence and psychosocial background of anxiety and depression emerging during the first trimester of pregnancy: data from a Hungarian population-based sample. *Psychiatric Danud. 25, ,* 352-358.

Bonari, L., Pinto, N., Ahn, E., Einarson, A., Steiner, M., & Koren, G. (2004). Perinatal risks of untreated depression during pregnancy. *J. Psychiatry 49*, 726-735.

Brittain, K., Myler, L., Koen, N., Koopowitz, S., A., D. K., Barnett, W., . . . Stein, D. (2015). Risk Factors for antenatal Depression and associations with infant Birth Outcomes: Results from a South African Birth Cohort Study. *Paediatr.Perinat. Epidemiol, 29*, 504-514.

Castro e Cousto, T., Martins Brancaglion, M. Y., Nogueira Cardodo, M., Bergo Protzner, A., Duarte Garcia, F., Nicolato, R., . . . Correa, H. (2015). What is the best tool for screening antenatal depression. *J. Affect. Disord. 178*, 120-17.

Chorwe-Sungani, G., & Chipps, J. (2017, Mar 24). A systematic Review of screening Instruments for Depression for use in antenatal services in low resource settings. *BMC Psychiatry*, p. 1.

CIDP. (2018). *Wajir County Referral and Teaching Hospital Statistics.* Wajir: Unpublished data.

Coll, C., de, V., da Silveira, M., Bassani, D. G., Netsi, E., Wehmeister, F. C., . . . Stein, A. (2017). Antenatal depressive symptoms among pregnant women: Evidence from a Southern Brazilian population-based cohort study. *J. Affect. Disord. 209, ,* 140-146.

Collin, P., Insel, T., Chockalingam, A., Daar, A., & Maddox, Y. (2013). Grand Challenges in Global Mental Health: Integration in Research, Policy, and Practice. . *PLOS Med. 10 e1001434*.

Cox, J., Holden, J., & Sagovsky, R. (1987). Detection of postnatal Depression. Development of the 10-item Edinburgh Postnatal Depression Scale. *Br. J. Psychiatry 150, ,* 782-786.

Dadi, F. A., Miller, E. R., Bisetegn, T., & Mwanri, L. (2020, February 04). Global Burden of antenatal Depression and its association with adverse birth outcomes: an umbrella review. *BMC Public Health 20, Article number 173 (2020)*.

Dias, C., & Figueiredo, B. (2015). Breastfeeding and depression: a systemic review of the literature. *J. Affect. Disord. 171*, 142-154.

Dibaba, Y., Fantahun, M., & Hindin, M. (2013). The association of unwanted pregnancy and social support with depressive symptoms in pregnancy: evidence from rural Southwestern Ethiopia. *BMC Pregnancy Childbirth 13*, .

Djamba, Y., & Kimuna, S. (2008). Intimate partner violence among married women in Kenya. *J. Asian Afri. Study. 43*, 457-469.

Fisher, J., Cabral de Mello, M., Patel, V., Rahman, A., Tran, T., Holton, S., & Holmes, W. (2012). Prevalence and determinants of common perinatal mental disorders in women in low-and lower-middle- income countries:. *A systematic review.*

Gelman, P., Flores-Ramos, M., Lopez-Martinez, M., Fuentes, C., & Grajeda, J. (2015). Hypothalamic-pituitary-adrenal axis function during prenatal depression. *Neurosci. Bull, 31*, p338-350.

Gentile, S. (2017). Untreated depression during pregnancy: Short-and long-term effects in offspring. A systemic review. . *Neuroscience 342*, 154-166.

Getinet, W., Amare, T., Boru, B., Shumet, S., W., W., & Azale, T. (2018). "Prevalence and risk factors for antenatal depression in Ethiopia: systematic review,. *Depression Research and Treatment vol. 2018*, , 12.

Giardinelli, L., Innocenti, A., Benni, L., Stefanini, M. C., Lino, G., Lunardi, C., . . . Faravelli, C. (2012). Depression and anxiety in perinatal period: Prevalence and risk factors in an Italian Sample. *Arch. Womens Ment. Health 15*, 21-30.

Glazier, R., Elgar, F., Goel, V., & Holzapfel, S. (2004). Stress, social Support, and emotional distress in a community sample of pregnant women. *J. Psychosom. Obstet. Gynaecol. 25*, 247-255.

Golbasi, Z., Kelleci, M., Kisacik, G., & Cetin, A. (2010). Prevalence and correlates of Depression in Pregnancy among Turkish women. *Matern.Child Health J. 14,*, 485-491.

Govender, D., Naidoo, S., & Taylor, M. (2019). Prevalence and Risk Factors of repeat pregnancy among South African adolescent females. *African Journal of Reproductive Health, Vol 23, no 1*, 73-87.

Govender, D.; Naidoo, S; Taylor, M. (2019). *Antenatal and Postpartum Depression: Prevalence and Risk Factors among Adolescents in Kwa Zulu Natal.* SouthArica: DRILL Fellow.

Gravensteen, I., Jacobsen, E., Sandset, P., Helgadottir, L., Radestad, I., Sandvik, L., & Ekeberg, O. (2018). Anxiety, depression and relationship satisfaction in the pregnancy following stillbirth and after the birth of a live-born baby: a Prospective study. *BMC Pregnancy Childbirth 18*.

Hamilton, M. (1960). A Rating Scale for Depression. *J. Neurol. Neurosurg, Psychiatry 23, ,* 56-62.

Harandi, T., Taghinasab, M., & Nayeri, T. D. (2017). The correlation of social support with mental health: A meta-analysis. *Electron. Physician 9*, 5212- 5222.

Hartley, T. F., Taghinasab, M., & Nayeri, T. (2017). The correlation of social support with mental health: A meta-analysis. . *Electron.Physician 9*, 5212-5222.

Howard, L., Piot, P., & Stein, A. (2014). No health without mental health. *Lancet 384*, 1723-24.

Husain, N., Cruickshank, K., Husain, M., Khan, S., Tomenson, B., & Rahman, A. (2012). Social stress and depression during pregnancy and in the postnatal period in British Pakistani mothers: a cohort study. *J. Affect. Disord. 140*, 268-278.

Joeng, H., Lim, J., Lee, M., Kim, S., Jung, I., & Joe, S. (2013b). The association of psychosocial factors and obstetric history with depression in pregnant women: focus on the role of emotional support. *Gen.Hosp. Psychiatry 35*, 354-358.

Kassa, G., Arowojolu, A., Odukogbe, A., & Yalew, A. (2018). Prevalence and Determinants of adolescent Pregnancy in Africa: A systemic review and Meta-Analysis. *Reproductive Health*.

Kathree, T., Selohilwe, O., Bhana, A., & Petersen, I. (2014). "Perceptions ofpostnatal depression and health care needs in a South African sample: the "mental" in maternal health care.". *BMC women's Health, Vol 14 no 1*, pp140.

Kelsey, J. (1996). *Methods in Observational epidemiology.* New York: Oxford University Press.

Kerie, S., Menberu, M., & Niguse, W. (2017). Prevalence and associated factors of postpartum depression in Southwest Ethiopia,. *BMC Research Notes, Vol. 11, no. 1*, P623.

Kyung, S., Park, Y. G., Park, Y., Ko, H. S., & Shin, J. C. (2014). Impact of antenatal depression on perinatal outcomes and postpartum depression in Korean women. *Journal of Research in Medical Sciences*.

Leigh, B., & Milgrom, J. (2008). Risk factors for antenatal depression, postnatal depression and parenting stress. *BMC Psychiatry 8, 24*.

Madlala, S., & Kassier, S. (2018). Antenatal and postpartum depression: Effects on infant and young child health and feeding practices . *South Afr. J. Clin. Nutri. 31*, 1-7.

Makii, M. J. (2015). *Utilization of Antenatal Care Services Among Adolescent Mothers in Mathare Informal Settlements, Nairobi COunty.* Nairobi: Kenyatta University.

Martini, J., Petzoldt, J., Einsle, F., Beesdo-Baum, K., Hofler, M., & Wittchen, H. (2015). Risk factors and course patterns of anxiety and depressive disorders during pregnancy and after delivery: A prospective- longitudinal study. . *J. Affect. Disord.175*, 385-395.

Mc Leish, J., & Redshaw, M. (2017). Mothers' accounts of the impact on emotional wellbeing of organized peer support in pregnancy and early parenthood: Aqualitative study. . *BMC Pregnancy Childbirth 17, 28*.

Meadows-Oliver, M., & Sadler, L. (2010). Depression among adolescent mothers enrolled in a high school parenting program. *Journal of psychosocial nursing and mental health services*, 34-41.

Minkovitz, C., Strobino, D., Scharfstein, D., Hou, W., Miller, T., Mistry, K., & Swartz, K. (2005). Maternal depressive symptoms and children's receipt of health care in the first 3 years of life. *Pedriatics*.

Mirieri, H. (2019). *Factors Associated with Prenatal Depression among Women Attending Antenatal Clinic at Coast Provincial Hospital, Mombasa County, Kenya.* Nairobi: UON Digital repository.

Mugenda, O., & Mugenda, O. (2003). *Research Methods. Quantitative and Qualitative Approaches.* Nairobi: Acts Press.

Muriithi, M. K. (2013). THE Determinants of Health-Seeking Behavior in a Nairobi Slum, Kenya. *European Scientific Journal* .

Neter, J., Wasserman, W., & Kutner, M. (1996). *Applied linear Statistical Models.* Irwin Chicago.

Nicolet, L., Moayedoddin, A., Miafo, J., Nzebou, D., Stoll, B., & Jeannot, E. (2021). Teenage Mothers in Yaounde Cameroon-Risk factors and Prevalence of Perinatal Depression Symptoms. *Journal of Clinical Medicine*.

Odimegwu, C., Amoo, E., & De Wet, N. (2018). Teenage Pregnancy in South Africa: where are the young men involved. . *South African Journal of Child Health vol 12, no 2b*, 44-50.

Ogbo, F. E. (2018). Determinants of antenatal depression and postnatal depression in Australia. *BMC Psychiatry*, 49.

Omidvar, S., Faramarzi, M., Hajian-Tilak, K., & Amiri, F. (2018). Associations of Psychosocial factors with pregnancy healthy life styles. *PLOS ONE 13, e0191723*.

Ongeri, L., Otieno, P., Mbui, J., Juma, E., & Mathai, M. (2016). Antepartum Risk Factors for Postpartum Depression: A Follow up Study among Urban Women Living in Nairobi, Kenya. *J. Pregnancy Child Health 2016;03(05)*.

Osok, J., Kigamwa, P., Keng-Yen, H., Grote, N., & Kumar, M. (2018). Adversities and mental health needs of pregnant adolescents in Kenya: Identifying interpersonal, practical, and cultural barriers to care. *BMC Women's Health 18, Art no. 96(2018)*.

Pascoe, J., Stolfi, A., & Ormond, M. (2006). Correlates of mothers' persistent depressive symptoms: A National Study. *Journal of Pediatric Health Care*, 261-269.

Rahman, M., Hossain, F., R., I., Jung, J., Mahmud, S., & Hashizume, M. (2011, March 15). Equity in Antenatal care Visits among adolescent mothers: An analysis of 54 country levels trend and projection of coverage from 2000 to 2030. *Journal of Global Health*.

Raisanen, S., Lehto, S., Nielsen, H., Gissler, M., Kramer, M., & Heinonen, S. (2014). Risk factors for and perinatal outcomes of major depression during pregnancy: a population-based analysis during 2002-2010 in Finland. *BMJ Open 4*.

Redshaw, M., & Henderson, J. (2013). From Antenatal to postnatal Depression: Associated factors and mitigating influences. *J. Womens Health 22*, 518-525.

Reid-V., M.-O. M. (2007). Postpartum depression among adolescent mothers: An integrative review of the literature. *Journal of Pediatric Health Care.*, 289-298.

Rena, B. (2008). The Impact of Cultural Factors Upon Postpartum Depression: A Literature Review. *Healthcare for women International*.

Robertson, E., Grace, S., Wallington, T., & Stewart, D. (2004). Antenatal risk factors for postpartum depression: a synthesis of recent literature. *Gen. Hosp. Psychiatry 26,* 289-295.

Rosner, B., Glynn, R., & Lee, M. (2006). The Wilcoxon signed rank test for paired comparisons of clustered data. *Biometrics*.

Rubertsson, C., Hellstrom, J., Cross, M., & Sydsjo, G. (2014). Anxiety in early pregnancy: prevalence and contributing factors. . *Arch. Womens Ment. Health 17*, 221-228.

Sara, P., Chrisman, M., Laura, P., & Richardson, M. (2013). Prevalence of Diagnosed Depression in Adolescents with History of Concussion. *Journal of Adolescent Health*, p533-546.

Shidhaye, P., & Giri, P. (2014). Maternal Depression: A Hidden Burden in Developing Countries. *Ann. Med. Health Sci. Res. 4*, 463.

Statistics solutions. (2012). *What is logistic regression*. Retrieved from Directory of Statistical Analysis: www.statisticssolutions.com

Stein, A., Pearson, R., Goodman, S., Rapa, E., Rahman, A., McCallum, M., . . . Pariante, C. (2014). Effects of perinatal mental disorders on the fetus and child. . *The Lancet 384*, 1800-1819.

Stewart, R., Umar, E., Tomenson, B., & Creed, F. (2014). A cross-sectional study of antenatal depression and associated factors in Malawi. *Arch. Womens Ment. Health 17*, 145-154.

Thompson, O., & Ajayi, I. (2016a). Prevalence of Antenatal Depression and Associated Risk Factors among Pregnant Women Attending Antenatal Clinics in Abeokuta North Local Government Area, Nigeria. *Depress Res Treat. 4518979.*

Tsai, A., Scott, A., Hung, K., Zhu, J., Mathews, L., Psaros, C., & Tomlinson, M. (2013). Reliability and Validity of Instruments for Assessing Perinatal Depresssion in African Settings: Systematic Review and Meta-Analysis. *Plos One.*

WHO. (2014). *Social Determinants of Mental Health.* Genenva: World Health Organization and Calouste Gulbenkian Foundation.

Dunkel Schetter C, Tanner L, (2012). Anxiety, depression and stress in pregnancy: implications for mothers, children, research, and practice. *Curr Opin Psychiatry.* 25(2):141-8Grote NK, Bridge JA, Gavin AR, (2010). A meta-analysis of depression during pregnancy and the risk of preterm birth, low birth weight, and intrauterine growth restriction. *Arch Gen Psychiatry.*; 67(10): 1012–24

Smith MV, Shao L, Howell H, (2011). Perinatal depression and birth outcomes in a Healthy Start project. *Matern Child Health J.*, 15(3): 401–9.

Mochache K, Mathai M, Gachuno O, (2018). Depression during pregnancy and preterm delivery: a prospective cohort study among women attending antenatal clinic at Pumwani Maternity Hospital. *Ann Gen Psychiatry.* 17:31.

Madeghe BA, Kimani VN, Vander Stoep A, (2016). Postpartum depression and infant feeding practices in a low income urban settlement in Nairobi-Kenya. *BMC Res Notes.* 9(1): 506.

Golbasi Z, Kelleci M, Kisacik G, (2010). Prevalence and correlates of depression in pregnancy among Turkish women. *Matern Child Health J.* 14(4): 485–91

Howard LM, Molyneaux E, Dennis CL, (2014). Non-psychotic mental disorders in the perinatal period. *Lancet.* 384(9956): 1775–88

Adewuya AO, Ola BA, Aloba OO, (2007). Prevalence and correlates of depression in late pregnancy among Nigerian women. *Depress Anxiety.* 24(1): 15–21.

Kelsey JL, Whittemore AS, Evans AS, (1996). Methods in observational epidemiology. *Monographs in Epidemiology and Biostatistics.*

Rubertsson C, Hellström J, Cross M, (2014). Anxiety in early pregnancy: prevalence and contributing factors. *Arch Womens Ment Health.* 17(3): 221–8.

Ahmed S. Maternal deaths averted by contraceptive use : An analysis of 172 countries maternal deaths averted by contraceptive use : an analysis of 172 countries. 2012; 6736:111–25

Kenya National Bureau of Statistics (KNBS), Ministry of Health (MoH), National AIDS Control Council (NACC), et al. 2015. Kenya Demographic and Health Survey 2014.

Cleland J, Conde-Agudelo A, Peterson H, et al. Contraception and health. Lancet [Internet]. 2012; 380:149–56. Available from: http://dx.doi.org/10.1016/

UNFPA 2014. Counties with the Highest Burden of Maternal Mortality

APPENDICES

APPENDIX I: QUESTIONNAIRE

INTRODUCTION LETTER

Aden Ismail Hassan

Mount Kenya University

Department of Public Health

P.O Box 43844-00100

Nairobi, Kenya.

Dear Respondent,

RE: LETTER OF INTRODUCTION FOR ACADEMIC RESEARCH STUDY

I am Aden Ismail Hassan, currently enrolled as a student at Mount Kenya University, where I am pursuing a master's degree in Public Health with a specialization in Epidemiology and Disease Control. The objective of this study is to explore the various factors contributing to prenatal depression among adolescent mothers attending the antenatal clinic at Wajir County Referral Hospital.

During the course of the study, you may encounter some questions of a personal nature that could potentially be embarrassing or uncomfortable. It is entirely within your right to decline to answer any such questions. Furthermore, you have the autonomy to terminate the interview at any point if you feel uncomfortable or if the interview interferes with your scheduled routine services. Your well-being and comfort are of utmost importance throughout this study.

Your involvement in this study is optional, and your confidentiality shall be strictly maintained. Any information you provide will be anonymized and used solely for research purposes. Your input is invaluable in helping us gain a better understanding of prenatal depression among adolescent mothers, and your contribution will aid in developing more effective interventions and support services.

If you have any concerns or questions regarding the study, please feel free to raise them, and they will be addressed promptly. Your comfort and well-being are our top priorities, and we are committed to ensuring that your participation in this study is a positive and enriching experience. Thank you for considering taking part in this important research endeavor.

Your Participation in this study will assist us to learn on effective antenatal services that can improve the mental health of pregnant mothers. You will also benefit from being assessed for risk

of prenatal depression, advance your knowledge on safe pregnancy management, addressing adolescent-related prenatal development challenges and improve your awareness important health care systems during pregnancy. In addition, risk due to early pregnancy, and depression resulting from poverty, family problems and lack of good healthcare among pregnant women will be addressed through counseling and advising adolescent mothers accordingly.

The study and its procedures have been approved by the Graduate school board and the School of Public Health, Mount Kenya University. You are free to ask any questions about the study that you do not understand. All information given will be confidential and anonymous.

Your co-operation is highly appreciated.

Yours Sincerely,

Aden Ismail Hassan

RESEARCH CONSENT FORM

FACTORS CONTRIBUTING TO THE BURDEN OF PRENATAL DEPRESSION AMONG ADOLESCENT MOTHERS SEEKING ANTE-NATAL CARE AT WAJIR COUNTY REFERRAL HOSPITAL, WAJIR COUNTY, KENYA.

NAME OF INVESTIGATOR: ADEN ISMAIL HASSAN

CONTACT: +254 722 641 961

Prenatal depression among adolescents poses a significant public health concern, impacting both mothers and their infants. Studies have indicated a prevalence of depression among adolescent women at 7.5%. Generally, depression affects approximately 20% of women, with pregnancy heightening susceptibility. In Kenya, the incidence of adolescent pregnancies, and consequently prenatal depression, is steadily rising. The expansion of urban informal settlements, inhabited largely by an emerging urban poor demographic, predominantly comprised of young individuals with limited access to healthcare, education, and basic amenities, exacerbates this challenge. This scenario mirrors the conditions in Wajir County, characterized by early and forced marriages, elevated poverty rates, widespread drug and substance abuse, high HIV prevalence, escalating teenage pregnancy rates, and low educational attainment levels.

This study aims to investigate the determinants linked to the prevalence of prenatal depression, examining socio-cultural, maternal, and healthcare system factors among adolescent mothers attending the antenatal clinic at Wajir County referral hospital. Participation in the study is voluntary and does not involve any financial or material incentives. All participants will provide informed consent by signing the consent form.

In this study, a case will be defined as an adolescent pregnant woman aged between 12 and 19 years, residing within the Wajir County region, who attends the antenatal clinic at the Wajir County Referral Hospital throughout the designated two-month study period. Cases will be identified based on an Edinburgh Postnatal Depression Scale (EPDS) score equal to or greater than 13. The EPDS is a locally validated tool utilized for identifying potential cases of both prenatal and postnatal depression.

Upon identification of cases, appropriate referrals and drug prescriptions will be provided to ensure comprehensive care and support. Strict confidentiality measures will be adhered to, safeguarding

the privacy of all participants' records throughout the study duration. During the study period, the investigator will be stationed at a medical camp, overseeing the implementation of the study protocols and ensuring the smooth progress of data collection and participant interactions.

PARTICIPANT CONSENT:

I _____ I hereby grant my consent to take part in this study. I acknowledge that all gathered information will be handled with the highest confidentiality. Moreover, I agree to undergo any other essential procedures for the study, as thoroughly explained to me.

STUDY'S STATEMENT OF CONSENT

Study's Participant's consent

I have received comprehensive explanations of the contents of this document in a language I understand, and all my questions have been satisfactorily answered. I acknowledge that my participation in this research is entirely voluntary, and I reserve the right to withdraw at any time. Additionally, I understand that all information shared by me will be handled confidentially. I will be provided with a copy of this consent document for my records. Therefore, I willingly consent to participate in this study.

Respondent's name _____Date_____

Respondent's Signature _____

Witness's Name (if participant is illiterate) _____

Witness's Signature _____ Date_____

Statement of Person Obtaining Informed Consent

I have provided the individual participating in the study with a thorough explanation of the research study's objectives. I confirm that she comprehends the nature of the study and has voluntarily granted her consent to participate.

Name of study staff obtaining consent_____

Signature_____Date_____

SECTION A: EDINBURG POST-NATAL DEPRESSION SCALE (EPDS)

Purpose: To establish the prevalence of prenatal depression among adolescent mothers attending antenatal clinic at Wajir County referral hospital.

As you are pregnant or have recently had a baby, we would like to know how you are feeling. Please check the answer that comes closest to how you have felt in the past 7days, not just how you feel today.

In the past 7 days:

1. I have been able to laugh and see the funny side of things
   - [ ] As much as I always could
   - [ ] Not quite so much now
   - [ ] Definitely not so much now
   - [ ] Not at all
2. I have looked forward with enjoyment to things
   - [ ] As much as I ever did
   - [ ] Rather less than I used to
   - [ ] Definitely less than I used to
   - [ ] Hardy at all
3. I have blamed myself unnecessarily when things went wrong
   - [ ] Yes, most of the time
   - [ ] Yes, some of the time
   - [ ] Not very often
   - [ ] No, never
4. I have been anxious or worried for no good reason
   - [ ] No, not at all
   - [ ] Hardly ever
   - [ ] Yes, sometimes
   - [ ]Yes, very often
5. I have felt Scared or panicky for no good reason
   - [ ] Yes, quite a lot
   - [ ] Yes, sometimes
   - [ ] No, not much
   - [ ] No, not at all

6. Things have been getting on top of me
   [ ] Yes, most of the time I haven't been able to cope at all
   [ ] Yes, sometimes I haven't been coping as well as usual
   [ ] No, most of the time I have coped quite well
   [ ] No, I have been coping as well as ever
7. I have been so unhappy that I have had difficulty sleeping
   [ ] Yes, most of the time
   [ ] Yes, sometimes
   [ ] Not very often
   [ ] No, not at all
8. I have felt sad or miserable
   [ ] Yes, most of the time
   [ ] Yes, quite often
   [ ] Not very often
   [ ] No, not at all
9. I have been so unhappy that I have been crying
   [ ] Yes, most of the time
   [ ] Yes, quite often
   [ ] Only occasionally
   [ ] No, never
10. The thought of harming myself has occurred to me
   [ ] Yes, quite often
   [ ] Sometimes
   [ ] Hardly ever
   [ ] Never

EPDS Score……

Case ☐ Control ☐

SECTION B: SOCIO DEMOGRAPHIC FACTORS

In order to ascertain the socio-demographic factors linked to the prevalence of prenatal depression among adolescent mothers receiving antenatal care at Wajir County referral hospital in Wajir County.

Instructions: Please respond to all the following questions either by writing in the provided space or by marking a cross (x) or tick in the appropriate box.

1. How old are you? .....
2. Can you read and write Yes [ ] No [ ]
3. Marital Status
   - Single [ ]
   - Married [ ]
   - Separated [ ]
   - Divorced [ ]
   - Widowed [ ]
   - Other (specify) [ ]
4. Religion
   - Christianity [ ]
   - Islam [ ]
   - Hindu [ ]
   - Other [ ]
5. What is your highest level of education?
   - Uneducated [ ]
   - Primary school [ ]
   - Secondary school [ ]
   - Tertiary [ ]
6. What is your occupation?
   - Farmer [ ]
   - Teacher [ ]
   - House wife [ ]
   - Others, Specify…….
7. Who do you live with?

Relative [ ]

Spouse [ ]

Alone [ ]

Friends [ ]

Others(specify)

8. What is your current gestational age?.....weeks
9. How many clinic visits have you attended so far? .....

a) <u>Current pregnancy</u>

10. Is this your first pregnancy? Yes [ ] No [ ]
11. Is the current pregnancy being more likely to cause depression? Yes [ ] No [ ]
12. Explain the type of complications

_____

_____

13. Have you experienced complications in this pregnancy such as complications with current pregnancy Yes [ ] No [ ]?
14. If yes, state the complications (tick where applicable)

Bleeding [ ]

Amniotic fluid complications [ ]

Co-morbidity e.g. hypertension [ ]

Ectopic pregnancy [ ]

Placental complications [ ]

Severe Nausea and Vomiting [ ]

Decline in the baby's activity level [ ]

Persistent Severe Headache [ ]

Abdominal Pain [ ]

Visual Disturbances [ ]

Swelling [ ]

15. Did you seek a health-based checkup? Yes [ ] No [ ]
16. Do you know the kind of check-ups one should do during pregnancy? Yes [ ] No [ ]
17. How often do you visit a hospital during pregnancy _____?

b) <u>Previous pregnancy</u>

18. Could you be having other live children? Yes [ ] No [ ]

If yes, how many……..……

If no, skip to number 11

19. Is this a pregnancy that you had planned for?

Yes [ ] No [ ]

If No, why? .....

20. Have you encountered any complications in your past pregnancies? Accept [ ]Deny [ ]

If you accept, which one?

Miscarriage [ ]

Still Birth [ ]

Fistula [ ]

Premature birth [ ]

Abortion [ ]

Other……

SECTION C: CULTURAL FACTORS FOR PRENATAL DEPRESSION

SOCIAL PROVISIONS SCALE

To identify the cultural elements linked to the prevalence of prenatal depression among adolescent mothers receiving antenatal care at the Wajir County referral hospital.

Instructions: As you respond to the subsequent inquiries, reflect on your present interactions with friends, family members, colleagues, community acquaintances, and similar connections. Please indicate the extent to which each statement represents your current relationships with others. Use the provided scale to express your perspective. **(Strongly agree=1, agree=2, Neutral=3, Disagree=4, Strongly disagree=5).**

Table 11Cultural factors for Prenatal Depression

Q #	**Question**	**Codes**				
		Strongly agree	**agree**	**Neutral**	**Disagree**	**Strongly disagree**

1.	Family pressures has been the reason for engaging in early marriage					
2.	I was forced into unplanned pregnancy					
3.	I may have wanted to continue schooling but cannot because of marriage					
4.	I lack a support system to seek guidance during times of stress.					
5.	Socio-cultural knowledge and interpretations limit need to access available health services					
6.	Negative cultural elements characterize prenatal care among adolescent women.					
7.	I have no close family and friend Relationships that offer me a feeling of emotional stability.					
8.	There is lack of effective sensitization for pregnant adolescent women					
9.	Young pregnancy results in social exclusions and depression are further compounded by cultural stigma					
10	Young women are encouraged by family/friends to use readily available tradition medications at pregnancy unlike the hospital and modern medications					
11	Husbands are exclusion of from prenatal education and care.					
12	Feeling vulnerable, uninformed, misunderstood, and need acceptance					

13	Barriers such as limited access to resources and social exclusions are common am adolescent women					

Revised Short Form of the Composite Abuse Scale (CASR-SF)

In this segment, we will inquire about your relationships as they constitute a significant aspect of your life that could impact your well-being. We are interested in your encounters within adult intimate relationships, which include spouses, partners, or significant others lasting longer than one month.

1. Have you ever engaged in an adult intimate relationship since the age of 12?
    a. Accept [ ]
    b. Deny -Skip out of remaining questions
2. Are you presently involved in a relationship?
    a. Accept [ ]
    b. Deny- Go to Q4
3. Do you presently experience fear in relation to your partner?
    a. Accept [ ]
    b. Deny [ ]
4. Have you ever experienced fear in relation to any partner?
    a. Yes [ ]
    b. No [ ]

We seek to ascertain if you encountered any of the behaviors outlined below, whether from a current or former partner(s). If you have experienced any of these actions, please indicate how frequently they occurred within the past 12 months. *(please tick one box on each line)*

Table 12 Composite Abuse Scale

My Partner (s) Indicators	**Has it ever happened to you**	**If YES, how often did it happen in the past 12 months?**

	No	Yes	Not in the past 12 months	Once	A few times	Monthly	Weekly	Daily almost daily
Held me accountable for provoking their violent actions.								
Jostled, shoved, seized, or hurled me.								
Attempted to persuade my family, children, or friends that I am insane or tried to turn them against me.								
Coursed me to act sex that I did not want to perform								
Shadowed me or loitered near my home or workplace.								
Threatened to inflict harm or death upon me or someone dear to me.								
Had sex with me without my consent								
Harassed me through phone calls, texts, emails, or social media platforms.								
Called me crazy, stupid, or inadequate.								
Struck me with a fist or object, kicked, or bit me.								
Restricted me from communicating with or								

visiting my family and friends.								
Restrained or confined me within a room or other enclosed area.								
Prevented me from obtaining employment, financial income, or monetary resources.								

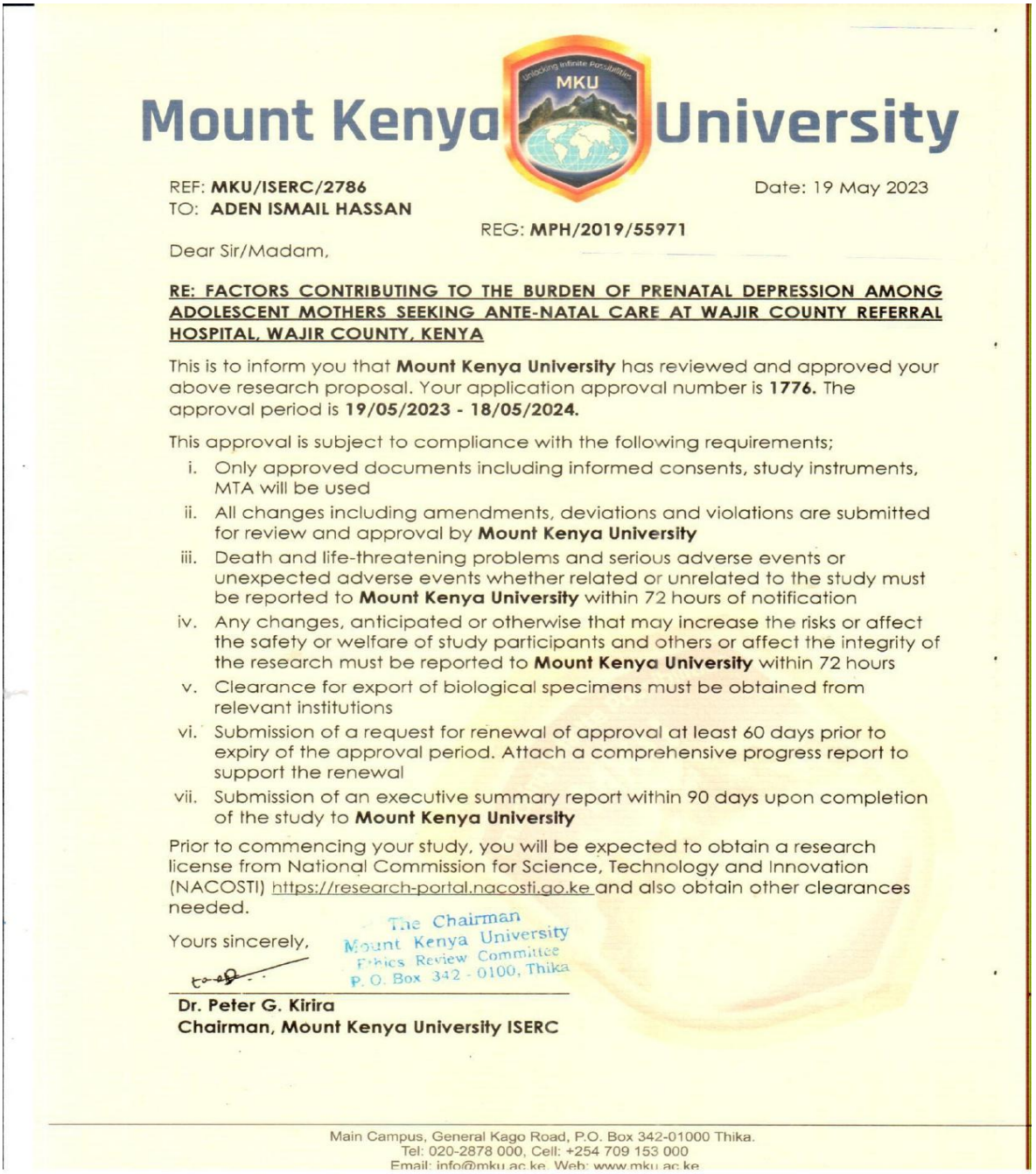
Health system factors

Table 13 Health Factors

Q #	**Question**	**Codes**				
		Strongly agree	agree	Neutral	Disagree	Strongly disagree
1.	There is poor government provision and utilization of antenatal care services					
2.	Increasing number of adolescent depression and mental health burden					
3.	Staff are not friendly when it comes to handling adolescent pregnant women					
4.	Facility is far from her home so is it a challenge to access basic health services					
5.	Poor security is on the way demoralizes search for hospital-based care.					

6.	A lack of adequate staff to raise awareness about the emotional, psychosocial, health, and educational challenges faced by vulnerable pregnant adolescents.					

Letter Of Authorization



Mount Kenya University

REF: **MKU/ISERC/2786** Date: 19 May 2023
TO: **ADEN ISMAIL HASSAN**
REG: **MPH/2019/55971**

Dear Sir/Madam,

RE: FACTORS CONTRIBUTING TO THE BURDEN OF PRENATAL DEPRESSION AMONG ADOLESCENT MOTHERS SEEKING ANTE-NATAL CARE AT WAJIR COUNTY REFERRAL HOSPITAL, WAJIR COUNTY, KENYA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **1776.** The approval period is **19/05/2023 - 18/05/2024.**

This approval is subject to compliance with the following requirements;

i. Only approved documents including informed consents, study instruments, MTA will be used
ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

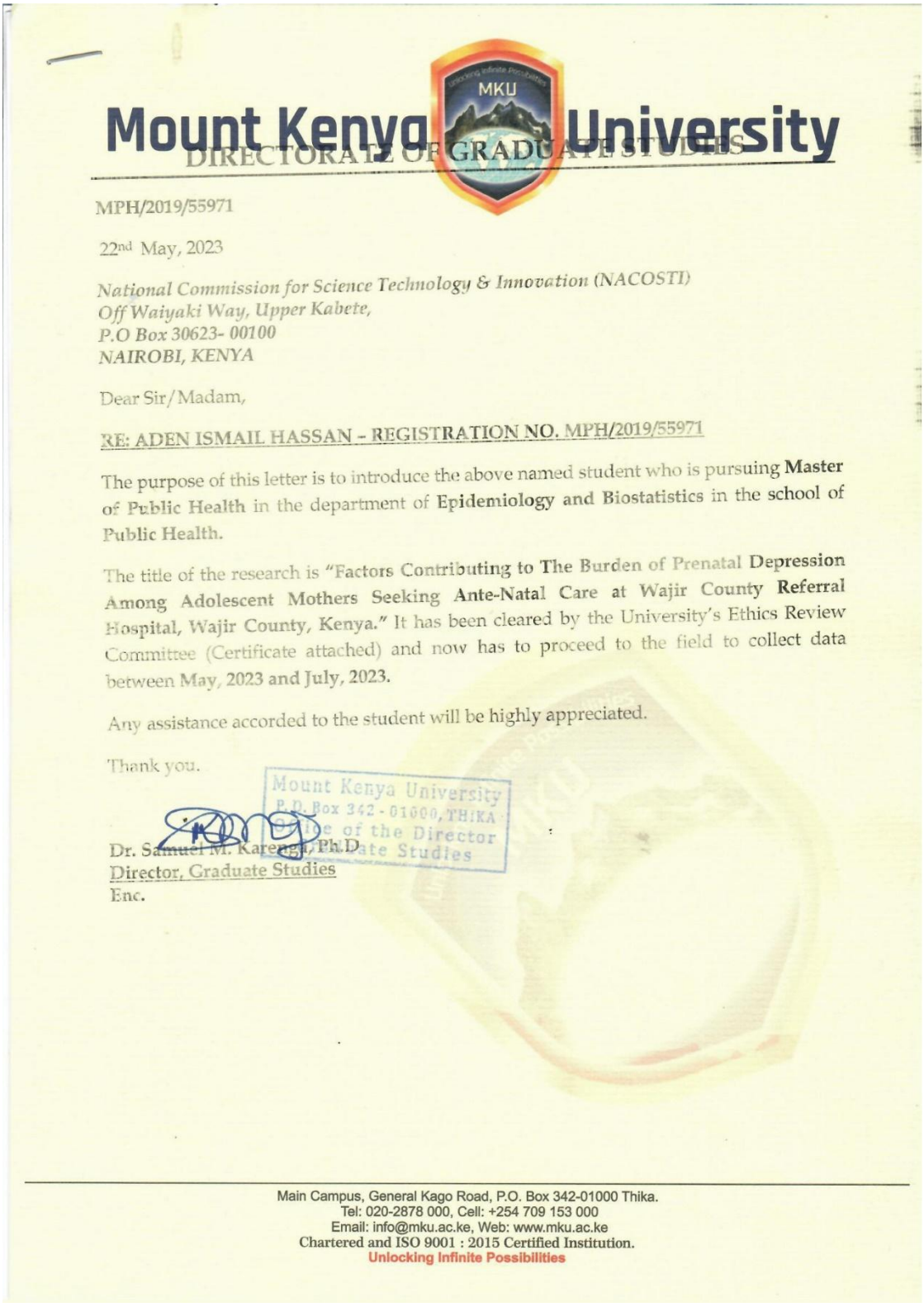
Yours sincerely,

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

Dr. Peter G. Kirira
Chairman, Mount Kenya University ISERC

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Tel: 020-2878 000, Cell: +254 709 153 000
Email: info@mku.ac.ke, Web: www.mku.ac.ke

Letter Of Introduction



Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MPH/2019/55971

22nd May, 2023

National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA

Dear Sir/Madam,

RE: ADEN ISMAIL HASSAN – REGISTRATION NO. MPH/2019/55971

The purpose of this letter is to introduce the above named student who is pursuing **Master of Public Health** in the department of **Epidemiology and Biostatistics** in the school of **Public Health.**

The title of the research is **"Factors Contributing to The Burden of Prenatal Depression Among Adolescent Mothers Seeking Ante-Natal Care at Wajir County Referral Hospital, Wajir County, Kenya."** It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **May, 2023 and July, 2023.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

Mount Kenya University
P.O Box 342-01000, THIKA
Office of the Director
Graduate Studies

Dr. Samuel M. Kareng'i, Ph.D.
Director, Graduate Studies
Enc.

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Tel: 020-2878 000, Cell: +254 709 153 000
Email: info@mku.ac.ke, Web: www.mku.ac.ke
Chartered and ISO 9001 : 2015 Certified Institution.
Unlocking Infinite Possibilities

Research permit from NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 719306

Date of Issue: 13/April/2024

RESEARCH LICENSE

This is to Certify that Mr., ADEN ISMAIL HASSAN of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Wajir on the topic: FACTORS CONTRIBUTING TO THE BURDEN OF PRENATAL DEPRESSION AMONG ADOLESCENT MOTHERS SEEKING ANTE-NATAL CARE AT WAJIR COUNTY REFERRAL HOSPITAL, WAJIR COUNTY, KENYA for the period ending : 13/April/2025.

License No: NACOSTI/P/24/34364

719306

Applicant Identification Number

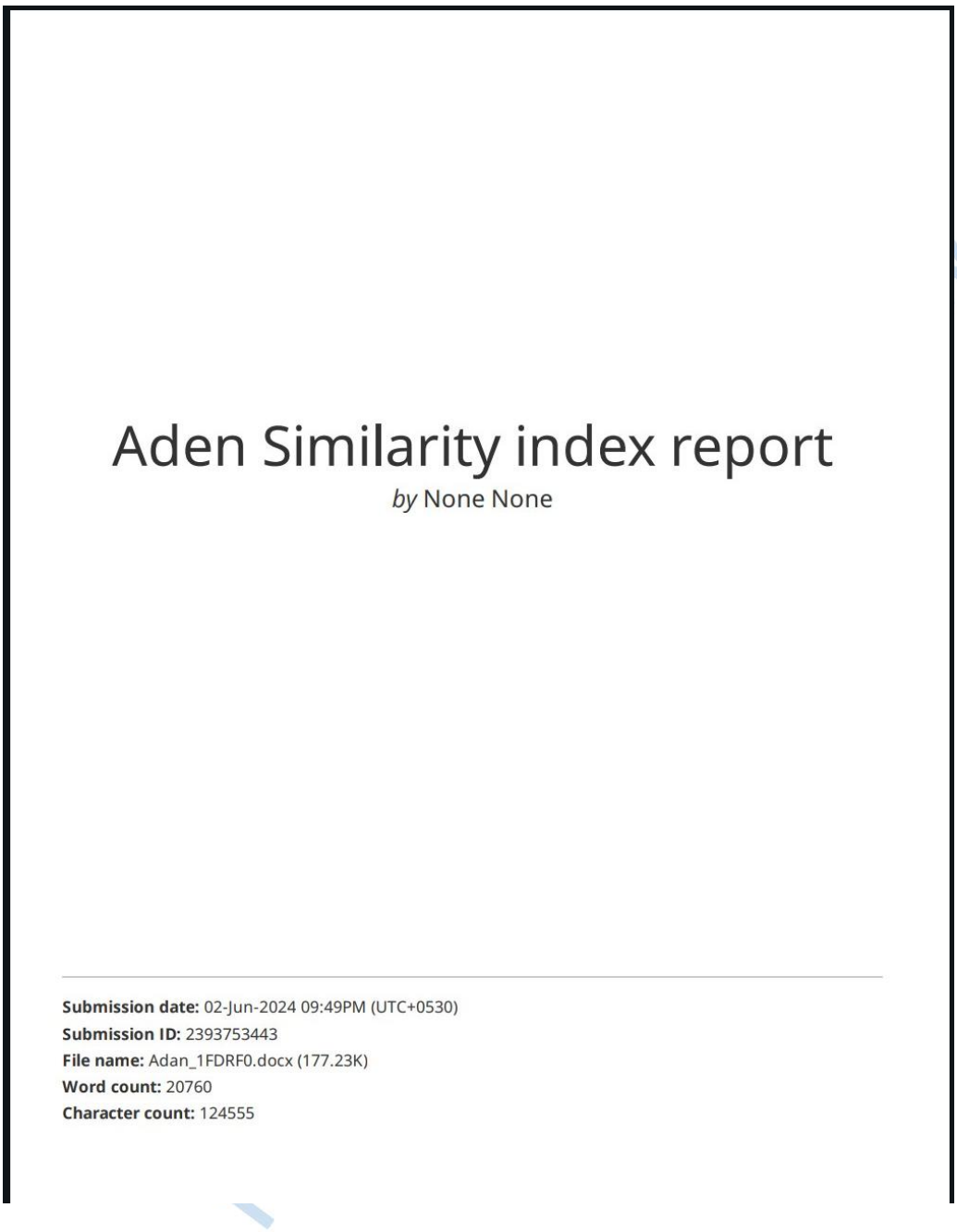
Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

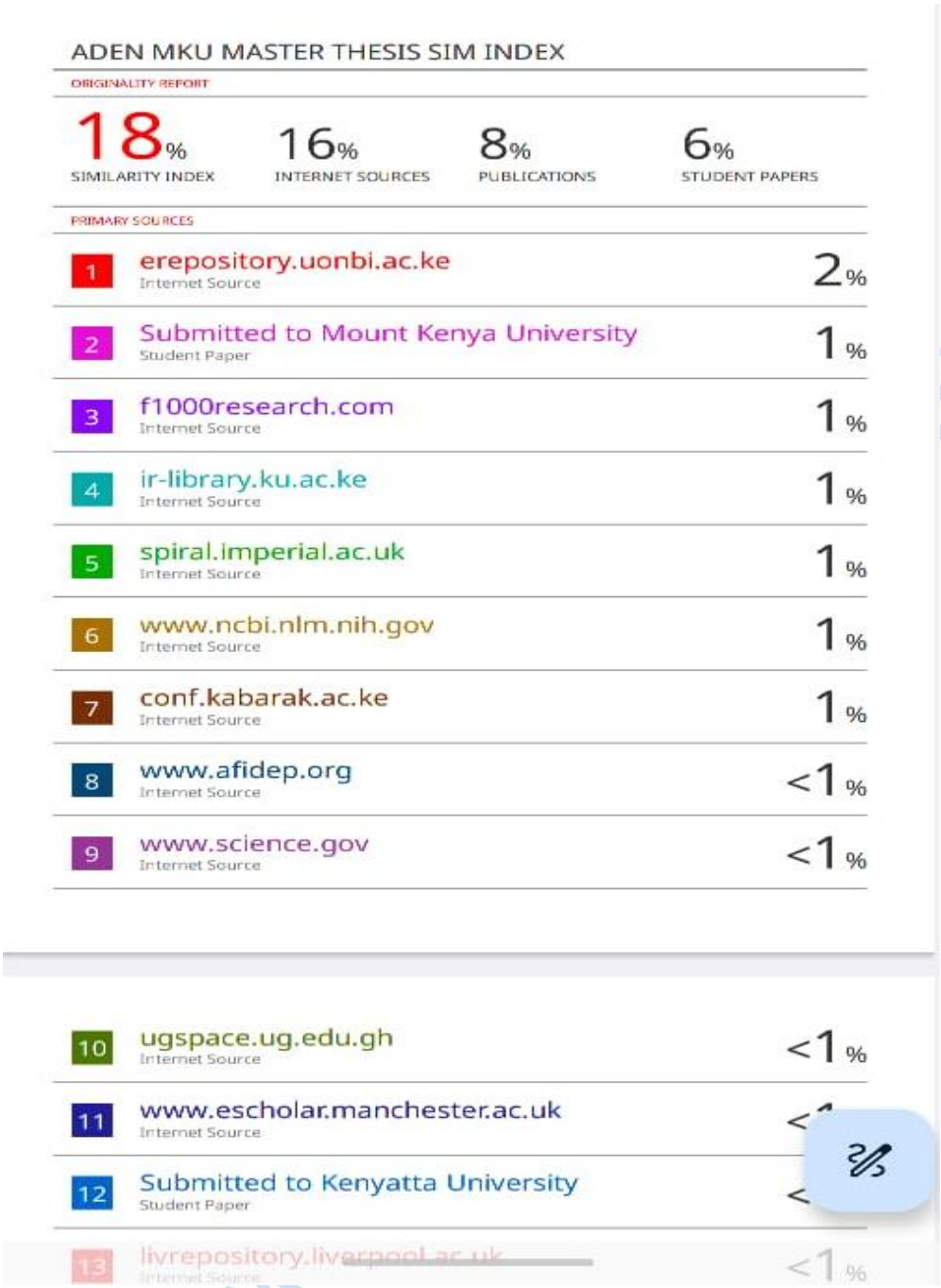
Similarity Index



Aden Similarity index report

by None None

Submission date: 02-Jun-2024 09:49PM (UTC+0530)
Submission ID: 2393753443
File name: Adan_1FDRF0.docx (177.23K)
Word count: 20760
Character count: 124555



ADEN MKU MASTER THESIS SIM INDEX

ORIGINALITY REPORT

18%	16%	8%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	erepository.uonbi.ac.ke Internet Source	2%
2	Submitted to Mount Kenya University Student Paper	1%
3	f1000research.com Internet Source	1%
4	ir-library.ku.ac.ke Internet Source	1%
5	spiral.imperial.ac.uk Internet Source	1%
6	www.ncbi.nlm.nih.gov Internet Source	1%
7	conf.kabarak.ac.ke Internet Source	1%
8	www.afidep.org Internet Source	<1%
9	www.science.gov Internet Source	<1%
10	ugspace.ug.edu.gh Internet Source	<1%
11	www.escholar.manchester.ac.uk Internet Source	<1
12	Submitted to Kenyatta University Student Paper	<1
13	livrepository.liverpool.ac.uk Internet Source	<1%

125	Desiree Govender, Saloshni Naidoo, Myra Taylor. ""I have to provide for another life emotionally, physically and financially": understanding pregnancy, motherhood and the future aspirations of adolescent mothers in KwaZulu-Natal South, Africa", BMC Pregnancy and Childbirth, 2020 Publication	<1 %
126	Marilyn Ford-Gilboe, C Nadine Wathen, Colleen Varcoe, Harriet L MacMillan et al. " Development of a brief measure of intimate partner violence experiences: the Composite Abuse Scale (Revised)—Short Form (CAS -SF) ", BMJ Open, 2016 Publication	<1 %
127	Priscila Krauss, Giovanni Marcos, Lucia Abelha, Leticia Fortes et al. "Chapter 10 Depression During Pregnancy: Review of Epidemiological and Clinical Aspects in Developed and Developing Countries", IntechOpen, 2011 Publication	<1 %
128	Sidra Abbas, Rubeena Zakar, Florian Fischer. "Exploring perceptions of nursing identity construction in Pakistan: Qualitative study on self, public, and professional perspectives", Research Square Platform LLC, 2024 Publication	<1 %
129	Women s Reproductive Mental Health Across the Lifespan, 2014. Publication	<1 %

Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	On		

Map Of Wajir County