DETERMINATION OF PSYCHOSOCIAL EFFECTS OF ADOLESCENT PREGNANCY ON MATERNAL HEALTH SERVICES UTILIZATION IN RONGAI SUB COUNTY, NAKURU COUNTY, KENYA

BY

DANIEL ATUKE OTWORI

A THESIS SUBMITTED IN PARTIAL FULFILMENT FOR THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY OF SCIENCE IN COMMUNITY HEALTH AND DEVELOPMENT

FACULTY OF HEALTH SCIENCES
DEPARTMENT OF COMMUNITY HEALTH AND DEVELOPMENT

GREAT LAKES UNIVERSITY OF KISUMU

DECLARATION

1. THE STUDENT

I, Daniel Atuke Otwori do hereby declare that this thesis is my original work and has not been submitted for the award of a degree or diploma in any other University or college.

Daniel Atuke Otwori

(REG No. P12/S03/2020

Signature…….. **Date** 9th August.2024

2. THE SUPERVISORS

We, the undersigned, confirm that this thesis has been submitted for examination with our approval as University Supervisors:

Prof. Bernard Omondi Abong'o

Great Lakes University of Kisumu

Signature……. **Date** 9th August2024

Dr.Lubeka Agrippina

Great Lakes University of Kisumu

Signature……. **Date** 9th August2024

PLAGIARISM DECLARATION

I, Daniel Atuke Otwori, declare that this thesis titled, "Determination of psychosocial effects of adolescent pregnancy on maternal health services utilization in Rongai Sub County, Nakuru County, Kenya", and the work presented in it are my own and have been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a doctor of philosophy of science in community health and development degree at Great Lakes University of Kisumu.

2. No part of this thesis has previously been submitted for a degree or any other qualification at this or any other institution.

3. Where I have consulted the published work of others, this is always clearly attributed.

4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work.

5. I have acknowledged all main sources of help.

6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself.

I am aware that failure to acknowledge such contributions and to provide proper citations could be considered plagiarism and may lead to disciplinary action by the university.

Signed:

Date: 9th August 2024

COPYRIGHT

ODA©2024

DEDICATION

This research thesis is dedicated to my Spouse Carren, daughter Prudence, son Klinsmann for their continuous support & my late lovely Mom Eunice Kemuma for her tireless encouragement, prayers and spiritual support to our family while she was alive.

ACKNOWLEDGEMENT

I am deeply grateful to the following individuals and institutions whose unwavering support and guidance have been instrumental throughout the completion of this thesis:First and foremost, I extend my sincere thanks to my supervisors. Prof. Benard Abong'o, Deputy Principal of the College of Health Great Lakes University of Kisumu, Prof. Kadenyi Misia, Dean Maasai University, Dr Paul Machoka Director of Research & Innovation JKCUAT, Dr. Lubeka Agrippina Director Nairobi Campus,Great Lakes University of Kisumu and Dr. Carina Otieno Director of Research & Innovation ,additionally I'm indebted to Prof. Charles Wafula, Dean of the Faculty of Community Health, John Moturi, Dean of the School of Nursing,Prof. Onyango Rosebella, Director of Postgraduate Studies at Great Lakes University of Kisumu,Peter Majoge, Department of Mathematics at Rongo University,Robin Mukangayi from Masinde Muliro University, and Dr. Elizabeth Kiptoo from the Ministry of Health, Nakuru County. Their invaluable insights, constructive critiques, and unwavering support have greatly enhanced this work. I am profoundly grateful for their dedication and guidance.

I would also like to acknowledge the management of Great Lakes University of Kisumu for their provision of up-to-date books and reference materials throughout my study period. Their support has been crucial to my research.

Special thanks go to my classmates for their encouragement and assistance, which positively impacted this research. I am particularly grateful to Pastor Albert Ombiro for his spiritual support and behind-the-scenes assistance, which has been a source of strength and motivation.

My heartfelt thanks extend to the Nakuru County Department of Health, the research assistants, the County Government of Nakuru, all staff at Rongai Sub County health facilities, and all participants who contributed by completing the questionnaires. Their collaboration was essential to the success of this research.

Finally, I wish to express my profound gratitude to my beloved wife, Carren Kwamboka. Your patience, understanding, and continuous support have been the bedrock of my journey. I also thank my son, Emmanuel Klinsmann, for his meticulous editing and proofreading, and my daughter, Prudence Perpetua, for her moral support. To my loving sisters, Margy,Sophy and Sarah, your encouragement and patience have meant the world to me. I love you all deeply and am grateful for your unwavering support.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF PLATES (PICTURES)

LIST OF APPENDICES (QUESTIONNAIRES, MAPS, ETHICAL APPROVALS)

LIST OF TABLES

ABBREVIATIONS OR ACRONYMS

ANOVA	Analysis of Variance
ANC	Antenatal Care
AFIDEP	African Institute for Policy Development
ASRH	Adolescent sexual and reproductive health
GLUSERC	Great Lakes University of Kisumu Scientific & Ethical Review Committee
GBV	Gender Based Violence
LMICs	Low- & Middle-Income Countries
IRC	International Rescue Committee
MDGs	Millennium development goals
MHS	Maternal Health Service
MMR	Moderated Multiple Regression
MOH	Ministry of Health
NACOSTI	Commission for Science, Technology &Innovation
NCPD	National Council for Population and Development National
NFHS	National Family Health Survey
OLS	Ordinary List Square
PHC	Primary Health Care
PNC	Post-Natal Care
UNFPA	United Nations Population Fund
SBA	Skilled Birth Attendant
SPSS	Statistical Package for the Social Sciences
SSA	Sub-Saharan Africa

SRH	Sexual & Reproductive Health
TRA	Theory of Reasoned Action
VAWG	Violence Against Women & Girls

OPERATIONAL TERMS

Adolescent sexual and reproductive health	The holistic health of adolescents comprises their capacity to safeguard themselves against unsafe abortions, unintended pregnancies, sexually transmitted infections (including HIV/AIDS), and various manifestations of sexual assault and coercion(WHO, 2023; UNFPA, 2022)..
Adverse neonatal outcome	The prevalence of low birth weight (LBW), preterm birth, low Apgar scores at 1 and 5 minutes after delivery, and serious neonatal illnesses(Titaleyet.al.2010)
Cases:	Adolescent girls who will be pregnant at the time of the interview(Titaley et al.2010) .
Controls	Adolescent girls who had never been pregnant at the time of the interview(Chandra-Mouli, V., Camacho, A. V., & Michaud, P. A. (2013).
Community	A group of individuals possessing varied attributes, who are interconnected by social bonds, exhibit shared viewpoints, and participate in joint endeavors within defined geographical areas or designated settings(Putnam, R. D. 2000).
Confidentiality	Mishandling information that a person has revealed to you under a trust relationship and with the expectation that it will not be disclosed to others without authorization(American Psychological Association (APA) Ethics Code 2017).

Family size	The number of people who shared the subject's home at any given time, as well as, for married people, the size of their families prior to marriage.
Informed consent	The express, voluntary consent of an individual who understands the purpose, nature, consequences, and risks of the intervention and who has freely consented to it and the benefits of the study(Beauchamp, & Childress,. 2019).
Parental communication on reproductive health issues	A discourse between a teenage child and one of their parents about specific issues, e.g.B. Menstruation, premarital sex prevention, HIV/AIDS and teenage pregnancy issues(WHO,.2017).
Parity	Achieving equality or fairness, particularly in terms of representation or opportunity
Psychosocial Effects	The impact that psychological and social factors have on an individual's mental health and overall well-being. This concept involves the interplay between psychological aspects (such as thoughts, emotions, and behavior) and social factors (such as relationships, societal norms, and environmental condition.For this study psycho-social factors were measured by use of surveys,questionnaire ,interviews and focused group discussions (Creswell, J. W., & Poth, C. N. 2018)

Teenage Pregnancy	Conception in teenage girls aged 10 to 19, whether resulting in live birth, miscarriage, or abortion.
Teenage Age Bracket	The range of ages that encompass adolescence, which is the period of development between childhood and adulthood(AmericanPsychological Association 2021)

ABSTRACT

Adolescent pregnancy presents significant challenges, impacting the physical, emotional, and social well-being of young mothers and their children. Despite global efforts to reduce adolescent pregnancy rates, psychosocial barriers continue to hinder maternal healthcare-seeking behaviors, particularly in resource-limited areas such as Rongai Sub-County, Nakuru, Kenya. This study aimed to examine the psychosocial factors influencing maternal healthcare utilization among pregnant adolescents in Rongai Sub-County. Specifically, the study sought to: identify sociodemographic factors associated with maternal healthcare service use; assess the prevalence and severity of psychosocial effects among pregnant adolescents aged 15-19; explore the relationship between psychosocial effects and antenatal care (ANC) utilization; and identify perceived barriers that influence healthcare utilization.A cross-sectional survey using a mixed-methods approach was conducted with 411 pregnant adolescents, selected through purposive convenience sampling. Data were collected via structured interviews and focus group discussions and analyzed using both quantitative and qualitative methods. Reliability testing of the adapted WHO questionnaire yielded a Cronbach's alpha of 0.74, indicating satisfactory reliability. Descriptive statistics revealed that 50.9% of participants experienced severe psychosocial effects. Inferential analysis, including Chi-square and multinomial logistic regression, demonstrated significant associations ($p < 0.05$) between sociodemographic variables, severe psychosocial effects, and barriers to ANC utilization. Notably, factors such as age ($p = 0.012$), parental status ($p = 0.045$), and perceived stigma ($p = 0.008$) were significantly correlated with ANC attendance.The study concluded that there is a complex interplay of sociodemographic and psychosocial factors influencing the utilization of maternal healthcare services among pregnant adolescents in Rongai Sub-County. The findings highlight the urgent need for interventions that address both the psychosocial impacts of adolescent pregnancy and the barriers to healthcare access. Based on these findings, it is recommended that adolescent-friendly healthcare services be established, with a focus on reducing stigma and improving community support systems. Additionally, expanding mental health resources and implementing targeted educational programs can help address the unique challenges faced by pregnant adolescents, ultimately improving healthcare utilization and maternal and child health outcomes.

CHAPTER ONE

INTRODUCTION

This section provides an overview of the historical, theoretical, and conceptual foundations. Additionally, it provides an overview of the research topic, the goal and objectives of the study, as well as the research questions and hypotheses. The study's significance and scope are also addressed.

1.1 Background of the study

Adolescent pregnancy, defined as pregnancy occurring in individuals aged 10-19, is a significant public health concern globally. Each year, over 21 million pregnancies occur among adolescent females in developing countries, with nearly 49% categorized as unintended (World Health Organization, 2022). These pregnancies lead to approximately 16 million live births and over 3.2 million induced abortions annually (WHO, 2022). This persistent issue underscores the need for targeted interventions to address the multifaceted challenges faced by pregnant adolescents as a result of assessing maternal health services.

In Sub-Saharan Africa (SSA), including Kenya, adolescent pregnancy is prevalent, with recent studies indicating that 45.5% of pregnancies in young women aged 15-19 are unintended (UNICEF, 2023). The region grapples with high rates of unwanted pregnancies, unsafe abortions, and adverse maternal health outcomes. This alarming statistic highlights the urgent need for comprehensive sexual education and accessible reproductive health services to prevent unwanted pregnancies. Adolescent mothers often face a myriad of challenges, including limited access to maternal health care, socioeconomic hardships, and significant psychosocial implications.

The high prevalence of adolescent pregnancies in SSA contributes to a cycle of poverty and limited educational opportunities for young mothers. A study by Osei et al. (2022) in Ghana found that adolescent mothers are less likely to complete secondary education compared to their peers, leading to decreased employment prospects and economic instability. This economic vulnerability can exacerbate mental health issues, as financial stress is a significant contributor to anxiety and depression among young mothers (Smith et al., 2023).

Unsafe abortions represent another critical challenge associated with adolescent pregnancy in the region. According to the World Health Organization (WHO, 2021), complications from

unsafe abortions are among the leading causes of maternal mortality in SSA. Adolescent mothers, often lacking proper healthcare access, are particularly at risk. The psychosocial implications of these experiences can be severe, leading to feelings of shame, isolation, and hopelessness (Johnson & Lee, 2024).

The psychosocial effects of adolescent pregnancy are profound, impacting mental health, social relationships, and overall quality of life. Research by Masten et al. (2020) emphasizes that adolescent mothers frequently experience higher rates of depression and anxiety compared to their non-pregnant peers. These mental health challenges can hinder their ability to seek and utilize maternal health services effectively.

Additionally, social relationships often suffer as a result of adolescent pregnancy. Stigma from peers and community members can lead to social isolation, further complicating the already challenging circumstances faced by young mothers (Kumar & Singh, 2023). Support networks are crucial; studies show that strong familial and community support can mitigate some negative psychosocial outcomes. For instance, a study by Nyongesa et al. (2021) found that adolescents who received adequate social support reported better mental health and were more likely to engage with healthcare services.

Moreover, the economic stability of adolescent mothers is often compromised. A study in Tanzania by Mkoka et al. (2022) revealed that adolescent mothers were more likely to experience financial difficulties and were less likely to pursue employment opportunities due to childcare responsibilities. This economic pressure can lead to a cycle of dependency, further affecting their mental health and social standing.

The psycho social implications of adolescent pregnancy are profound, affecting mental health, social relationships, and economic stability (Smith et al., 2023; Johnson & Lee, 2024).Understanding the psychosocial factors associated with adolescent pregnancy is essential for improving maternal health service utilization. As highlighted by Afolabi et al. (2020), adolescents who face psychological distress or social stigma are less likely to seek prenatal care. To address this, health interventions must incorporate psychosocial support services alongside medical care to create a more holistic approach to adolescent maternal health.

Programs designed to enhance social support and reduce stigma can lead to improved health outcomes for adolescent mothers. For example, community-based interventions that involve

peer support groups have shown promise in various settings, fostering a sense of belonging and encouraging young mothers to engage with health services (Chandra-Mouli et al., 2021).

The psycho social effects of adolescent pregnancy encompass a range of emotional, mental, and social challenges that significantly impact young mothers' lives. Research has shown that adolescent mothers often experience heightened psychological stress, which can lead to mental health issues such as depression, anxiety, and low self-esteem. The pressures of managing motherhood while navigating adolescence, combined with societal stigma, contribute to these mental health challenges (Smith et al., 2023; Mwaura & Ochieng, 2022). Social dynamics for adolescent mothers are notably affected by isolation and strained relationships with family, peers, and community members. Stigmatization and judgment related to teenage pregnancy can exacerbate these challenges, leading to reduced social support and integration (Njeri et al., 2023).Financial constraints are also a significant component of the psycho social effects of adolescent pregnancy.According to Smith et al., (2023) studies shows that young mothers frequently face economic difficulties that impact their access to essential maternal and child health services. These economic hardships can hinder their ability to seek adequate prenatal and postnatal care, affecting their overall well-being

Elsewhere various studies found out that utilization of maternal health services plays a crucial role in mitigating the psychosocial effects of adolescent pregnancy. Access to comprehensive services, including prenatal care, counseling, and postnatal support, can significantly alleviate the challenges faced by young mothers. However, gaps in the availability and accessibility of these services, especially in regions like Rongai Sub County, Nakuru County, hinder their effectiveness (WHO, 2023).

Rongai Sub County, located in Nakuru County, Kenya, is characterized by distinct socio-cultural and economic conditions that impact adolescent pregnancy and maternal service utilization. Recent estimates suggest that approximately 18% of girls aged 15-19 in Kenya have given birth or are currently pregnant (Kenya National Bureau of Statistics, 2023). In Rongai, socio-demographic factors such as limited access to sex education, poverty, early marriages, and entrenched socio-cultural norms contribute to high rates of adolescent pregnancies.

Despite substantial global and national literature on the impact of psychosocial factors on maternal health service utilization, there is a notable gap in localized studies focusing on specific regions like Rongai Sub County. Existing research primarily addresses broader trends,

leaving a gap in understanding the specific psychosocial determinants affecting pregnant adolescents in this locality.

This research aims to address this gap by examining the psychosocial effects of adolescent pregnancy on maternal health service utilization in Rongai Sub County. Understanding these localized factors is essential for developing context-specific interventions and improving maternal health outcomes.

1.2 Statement of Problem

Adolescent pregnancy poses significant challenges to maternal health, particularly in resource-limited settings like Rongai Sub County, Nakuru County, Kenya. Globally, adolescent pregnancy is a pressing public health issue, with an estimated 21 million girls aged 15-19 giving birth each year (World Health Organization, 2021). In Kenya, the prevalence of adolescent pregnancy remains alarmingly high, with approximately 18% of young women aged 15-19 having given birth (Kenya National Bureau of Statistics, 2021).

The psychosocial effects of adolescent pregnancy—such as stigma, mental health issues, and social isolation—play a critical role in shaping the experiences of young mothers and their interactions with maternal health services. Studies indicate that pregnant adolescents often face social stigma, which can lead to feelings of shame and isolation, significantly impacting their mental health (Petersen et al., 2020). This stigma can deter young mothers from seeking necessary healthcare services, perpetuating a cycle of inadequate care and poor health outcomes (Chandra-Mouli et al., 2014).

While not all adolescents experience these psychosocial challenges to the same degree, those who do often encounter substantial barriers to accessing and utilizing maternal health services. For instance, research shows that fear of judgment and lack of support from family and peers can lead to delayed or foregone prenatal care, resulting in increased risks of complications during pregnancy and childbirth (Ganchimeg et al., 2016).

Recent studies highlight the complex interplay between psychosocial determinants and maternal health service utilization. Smith et al. (2023) reveal that stigma, coupled with mental health concerns, constitutes major barriers to accessing antenatal and postnatal care among pregnant adolescents. These psychosocial barriers are further compounded by social isolation, which exacerbates the difficulties in accessing necessary healthcare services. This issue is compounded by evidence suggesting that while psychosocial support interventions can

improve service uptake, their success is highly dependent on specific socio-cultural contexts (Johnson & Lee, 2024; WHO, 2023).

In Kenya, research by Muriithi and Nyambura (2022) shows that adolescent mothers face unique psychosocial challenges including familial pressure and socio-economic constraints, which negatively affect their utilization of maternal health services. Despite these findings, there is a notable lack of localized research focusing on how these psychosocial factors specifically influence service utilization in Rongai Sub County. This region has distinct socio-cultural and economic characteristics that could significantly impact the psychosocial dynamics of adolescent pregnancy.

The existing literature underscores a critical need for research that explores how psychosocial factors affect maternal health services utilization in specific local contexts. By addressing this gap, the study aims to provide a comprehensive understanding of the psychosocial determinants influencing maternal health service utilization among adolescents in Rongai Sub County. This localized perspective is essential for developing targeted, effective interventions and health policies that address the unique needs of pregnant adolescents in this region.

1.3 Justification of the Study

Adolescent pregnancy presents significant challenges to maternal and child health globally, with psychosocial factors frequently leading to negative outcomes. In Rongai Sub-County, Nakuru County, Kenya, this issue is particularly pressing as recent data indicates that the prevalence of adolescent pregnancy in Rongai is approximately 16%, which is notable when compared to neighboring sub-counties such as Njoro and Molo, where rates are 12% and 10% respectively (Kenya National Bureau of Statistics, 2021). This higher prevalence underscores a critical need for focused research and intervention in Rongai.

Despite the extensive documentation of the adverse effects of adolescent pregnancy on maternal and child health, there is a significant gap in research specifically exploring how psychosocial factors influence the utilization of maternal health services among young mothers in this region. For instance, studies have shown that stigma, social isolation, and mental health issues can deter pregnant adolescents from seeking essential care (Chandra-Mouli et al., 2014; Ganchimeg et al., 2016). Understanding these psychosocial determinants is essential for

identifying the unique barriers faced by adolescents in Rongai, which may differ from those in other sub-counties or urban areas.

By focusing on the psychosocial aspects that affect service utilization, this study aims to provide empirical evidence that can inform targeted interventions and support evidence-based policymaking. Integrating psychosocial support into maternal health programs is crucial for enhancing accessibility and encouraging the utilization of essential healthcare services among adolescents. Ultimately, this research aspires to improve maternal and child health outcomes in Rongai Sub-County by addressing barriers to care and fostering a supportive environment for young mothers.

1.4 ~~O~~bjectives of the study

This study was guided by the two sub groups of the objectives

1.4.1General objective of the study

The general aim of this study was to investigate the psychosocial factors influencing maternal health service utilization among adolescents experiencing pregnancy in Rongai Sub-County, Nakuru County, Kenya

1.4.2 Specific Objectives of the Study

The study was guided by the following specific objectives:

1) To identify the socio-demographic factors associated with optimal maternal services utilization among pregnant adolescents in Rongai Sub County, Nakuru.
2) To assess the prevalence and severity of psychosocial effects experienced by pregnant adolescents aged 15-19 years in Rongai Sub County, Nakuru.
3) To examine the relationship between psychosocial effects of adolescent pregnancy and the utilization of antenatal care (ANC) services among pregnant adolescents in Rongai Sub County, Nakuru.
4) To explore perceived barriers associated with psychosocial factors that influence maternal health services utilization among pregnant adolescents in Rongai Sub County, Nakuru.

1.5 Research Hypothesis

The following hypotheses were tested in this study. For each hypothesis, a significance level of $p > 0.05$ was used, corresponding to a 95% confidence interval. The null hypothesis (Ho)

assumes no effect or relationship, while the alternative hypothesis (Ha) proposes a significant effect or relationship. The level of significance for each hypothesis was determined based on statistical analysis using appropriate tests.

Hypothesis 1

Ho1: There is no significant association between socio-demographic factors (such as age, education level, socioeconomic status, and marital status) and optimal maternal service utilization among pregnant adolescents in Rongai Sub-County, Nakuru.

Ha1: There is a significant association between socio-demographic factors (such as age, education level, socioeconomic status, and marital status) and optimal maternal service utilization among pregnant adolescents in Rongai Sub-County, Nakuru.

Level of significance: $p > 0.05$ for acceptance/rejection of the null hypothesis.

Hypothesis 2

Ho2: There are no severe psychosocial effects of adolescent pregnancy in Rongai Sub-County.

Ha2: There are severe psychosocial effects of adolescent pregnancy in Rongai Sub-County.

Level of significance: $p > 0.05$ for acceptance/rejection of the null hypothesis.

Hypothesis 3

Ho3: There is no significant relationship between psychosocial effects of adolescent pregnancy and the utilization of antenatal care (ANC) services among pregnant adolescents in Rongai Sub-County, Nakuru.

Ha3: There is a significant relationship between psychosocial effects of adolescent pregnancy and the utilization of antenatal care (ANC) services among pregnant adolescents in Rongai Sub-County, Nakuru.

Level of significance: $p > 0.05$ for acceptance/rejection of the null hypothesis.

Hypothesis 4

Ho4: There is no significant association between perceived barriers related to psychosocial factors influencing maternal service utilization among pregnant adolescents aged 15-19 years in Rongai Sub-County.

Ha4: There is a significant association between perceived barriers related to psychosocial factors and maternal service utilization among pregnant adolescents aged 15-19 years in Rongai Sub-County.

Level of significance: $p > 0.05$ for acceptance/rejection of the null hypothesis.

Each of the above hypotheses was tested using appropriate statistical methods, and the p-values derived from the tests determined whether the null hypotheses should be accepted or rejected at the 95% confidence level ($p > 0.05$). The research findings will indicate which of the null hypotheses can be rejected in favor of the alternative hypotheses, offering valuable insights into the factors influencing maternal healthcare utilization among pregnant adolescents in Rongai Sub-County.

1.6 Significance of the Study

This study is significant in its potential to address key gaps in understanding and improving maternal healthcare services for pregnant adolescents in Rongai Sub County, Nakuru County, Kenya. It focuses on identifying the psychosocial barriers that young mothers face, which is essential for creating interventions that can enhance service utilization. By offering evidence-based insights, this research will allow healthcare providers and policymakers to design antenatal care services that are more accessible and tailored to the unique needs of adolescent mothers, thereby improving maternal healthcare delivery in the region.

Additionally, by examining the prevalence and severity of psychosocial challenges experienced by pregnant adolescents, the study contributes to a deeper understanding of the mental health difficulties within this demographic. This information is critical for establishing mental health support services that address the specific needs of young mothers, which, in turn, can lead to improved well-being and overall health outcomes. Recognizing and addressing these mental health challenges can significantly enhance the quality of life for adolescent mothers, helping them to navigate pregnancy with better resources and support systems.

This research also sheds light on the socio-cultural and economic factors that impact the utilization of maternal services among adolescent mothers in Rongai Sub County. Such insights are invaluable for shaping public health policies and initiatives aimed at reducing teenage pregnancies and enhancing maternal healthcare access and quality. By understanding these contextual factors, policymakers can create targeted programs that are responsive to the unique challenges faced by adolescent mothers in the community, thus fostering an environment that supports maternal and child health.

Identifying the perceived barriers and facilitators to maternal service utilization will also inform the design of community-based interventions and educational initiatives. These programs can help raise awareness about the importance of maternal health and establish support systems to promote better healthcare access for pregnant adolescents. Through these community-driven approaches, adolescent mothers can receive the encouragement and guidance needed to seek timely and appropriate maternal healthcare.

Furthermore, this study adds to the growing body of literature on adolescent pregnancy and maternal healthcare, with a focus on a specific region in Kenya. This localized data enriches the global conversation on adolescent pregnancy and maternal health by providing insights that can be compared with findings from national and international studies. The data generated will also offer a point of reference for further research, enhancing the understanding of adolescent maternal health across different contexts.

In summary, the significance of this study is broad, encompassing improvements in maternal health services, better adolescent health outcomes, policy guidance, community-based support, and contributions to global research. By addressing psychosocial factors influencing maternal service utilization, the study aims to advance the health and well-being of pregnant adolescents in Rongai Sub County and beyond

1.7 Limitations and Delimitation of the Study

1.7.1 Limitations of the study.

This study faced several limitations. Firstly, some participants struggled to accurately recall past experiences, particularly regarding specific timelines. Additionally, language and cultural differences between researchers and participants affected communication and understanding during data collection, which could lead to misinterpretation of responses. Some participants also provided answers that did not align with the researchers' expectations or hypotheses, potentially introducing bias into the results; however, measures to minimize response bias, such as ensuring confidentiality and anonymity, were implemented. Furthermore, resource constraints, including time, funding, and personnel, limited the scope of data collection, sample size, and analysis methods. Lastly, the findings may have limited external validity beyond Rongai Sub-County, Nakuru, and may not be applicable to other geographic locations or cultural contexts without further validation.

1.7.2 Delimitations of the Study

The study targeted adolescent females aged 15 to 19 in Rongai Sub-County, Nakuru County, Kenya, focusing specifically on the psychosocial effects of adolescent pregnancy on maternal service utilization. It did not account for other potentially relevant factors, such as socioeconomic status, education level, or geographic location, which might also influence maternal health outcomes. There was a potential for response bias, as participants could have provided answers that aligned with the researchers' expectations. To mitigate this, efforts to ensure confidentiality and anonymity were implemented. The study faced limitations due to resource constraints, including time, funding, and personnel, which impacted data collection, sample size, and analysis methods. Additionally, the findings had limited external validity, and their applicability to other geographic locations or cultural contexts required further validation.

1.8 Chapter Summary

In summary, Chapter One of this study on the psychosocial effects of adolescent pregnancy on maternal health service utilization in Rongai Sub-County, Nakuru, offers a comprehensive introduction to the research topic. It outlines the background and significance of the study, clarifies its objectives, and defines its scope. Additionally, this chapter presents the overall structure of the study, setting the stage for the subsequent exploration of the determinants affecting maternal health service utilization among pregnant adolescents

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides a comprehensive review of the pertinent literature from various sources in alignment with the research objectives. This thesis provides an overview of the existing scholarly literature pertaining to the topic of adolescent pregnancy. The objective of this chapter is to conduct a comprehensive assessment of the existing literature pertaining to adolescent pregnancy. This study initially explored the difficulties that the writers encountered when attempting to develop a comprehensive comprehension of this particular concept. The initial section of the chapter centers on comprehending the sociodemographic and psychosocial determinants associated with optimal maternal services utilization among pregnant adolescents, as well as the prevalence and severity of psychosocial effects experienced by pregnant adolescents aged 15-19 years. The subsequent section addresses the association between psychosocial effects of adolescent pregnancy and the utilization of antenatal care (ANC) services among pregnant adolescents. The final section of the study examines the perceived barriers and facilitators influencing maternal services utilization related to psychosocial factors among pregnant adolescents. This review synthesizes global and local literature to identify key factors affecting maternal health service utilization, critiques existing research, and highlights research gaps. The concluding portion of the chapter centers on the theoretical viewpoints pertaining to comprehending adolescent pregnancy, as well as the conceptual framework. This study highlights a research need in the existing literature pertaining to the identification of addressing the psychosocial effects of adolescent pregnancy and their impact on maternal services utilization in Rongai Sub County, Nakuru, is essential for improving maternal health outcomes among this vulnerable group, specifically among those aged 15 to 19 years

2.2 Empirical Review

This section discusses literature based on the key variables in this study. It discusses the relationship of the variables, gaps and methods used to process measurable results. It's discussed based on the specific objectives of this study.

2.2.1. Sociodemographic Determinants Associated With Optimal Maternal Services Utilization

2.2.2 Age as a Sociodemographic Determinant Associated With Optimal Maternal Services Utilization

Age is a critical sociodemographic determinant affecting maternal health service utilization globally, with younger and older adolescents experiencing distinct challenges and outcomes. Research consistently shows that younger adolescents, particularly those aged 15–17, face numerous barriers to accessing maternal health services, including limited autonomy, lower health literacy, and significant social stigma around teenage pregnancy (Ganchimeg et al., 2014). These factors not only hinder their ability to navigate healthcare systems but also lead to delays in seeking essential prenatal and postpartum care. Younger adolescents often require parental or partner support to access health services, which may not always be readily available, resulting in gaps in their care.

Older adolescents, typically aged 18–19, are generally more successful in accessing maternal services due to greater maturity, autonomy, and health literacy. Research indicates that these adolescents are more likely to utilize prenatal care services, reflecting their enhanced ability to navigate healthcare systems and higher awareness of maternal health needs (Ganchimeg et al., 2014). This distinction between younger and older adolescents underscores the importance of tailoring interventions based on age-specific needs and challenges to optimize maternal health outcomes among adolescents.

In Kenya, adolescent pregnancy rates are significantly high among those aged 15–19, making maternal health service accessibility a critical issue (Kenya Demographic and Health Survey [KDHS], 2014). Younger adolescents within this group are particularly vulnerable due to limited access to comprehensive reproductive health services, partly due to cultural norms and societal expectations that stigmatize early pregnancy (Ministry of Health, Kenya, 2022). These cultural and societal constraints contribute to substantial disparities in healthcare access, especially in semi-rural regions like Rongai Sub County, Nakuru, where traditional norms often dictate healthcare-seeking behavior. The younger adolescents in such settings face compounded barriers, including social stigma, which discourages them from seeking prenatal care or other essential maternal health services.

Globally, disparities in maternal health service utilization across age groups are evident. The United Nations Population Fund (UNFPA, 2020) highlights that adolescents under 18 encounter greater challenges due to legal restrictions, limited autonomy, and social stigma surrounding early childbearing. Research from the World Health Organization (WHO, 2011)

suggests that younger adolescents are more likely to delay seeking prenatal care because of fears around disclosure and lack of family support. This pattern is observed across various low- and middle-income countries, where social norms and limited healthcare resources further complicate access to maternal services for younger adolescents.

Despite valuable insights into the impact of age on maternal health service utilization, there are still critical knowledge gaps. Most studies emphasize age alone but overlook intersecting factors like socioeconomic status and education, which could further elucidate the challenges faced by younger adolescents. Additionally, while some interventions aim to support younger adolescents, there is limited research on the effectiveness of these interventions in improving maternal service access specifically for this age group. Another underexplored area is how cultural and societal expectations uniquely affect adolescents in different sub-populations within semi-rural and rural settings, such as Rongai Sub County. Without this culturally specific information, interventions may fail to address the root causes of healthcare disparities among younger adolescents in these areas.

To address these knowledge gaps, this study integrates age with socioeconomic and educational factors to provide a more nuanced understanding of barriers faced by younger adolescents in accessing maternal health services. Additionally, the study implements and evaluates targeted interventions specifically designed for younger adolescents, assessing their effectiveness in improving maternal health outcomes. By examining the cultural norms and societal expectations in Rongai Sub County, the study aims to develop interventions that are culturally appropriate and tailored to meet the needs of different sub-populations. Through these targeted approaches, the study aspires to enhance maternal health service utilization among adolescents in semi-rural settings, contributing to more equitable healthcare access across age groups and cultural contexts.

2.2.3 Marital status as social determinant

The literature on marital status as a social determinant of maternal health service utilization reveals complex dynamics that vary across regions and sociocultural contexts. Marital status influences adolescents' access to healthcare, the level of social support they receive, and the psychosocial challenges they may face, all of which impact maternal health outcomes.

Globally, research shows that married adolescent mothers often have better access to maternal health services compared to their unmarried counterparts, primarily due to the support networks available to them. Studies in sub-Saharan Africa, such as those by Kanyonga et al. (2020), suggest that married adolescents, especially those with supportive spouses, are more likely to utilize prenatal and postnatal care due to increased access to financial and emotional resources. These supportive networks often include not only the spouse but also extended family members and community resources, which collectively enhance the ability of married adolescents to navigate healthcare systems. In addition, married adolescents often experience social acceptance in accessing maternal services, which contributes to higher service utilization rates in various contexts, including both urban and rural settings.

However, early marriage does not guarantee unrestricted access to healthcare. Research highlights that married adolescents may face unique challenges, including financial strain, high domestic responsibilities, and societal expectations, which can negatively impact their ability to seek consistent healthcare. Studies across South Asia and Africa have pointed out that while marriage might provide some social support, it can also intensify the adolescents' stress due to economic burdens and social expectations, as Kanyonga et al. (2020) discusses. This combination of pressures can discourage regular utilization of maternal healthcare, especially in settings where resources are limited or traditional gender roles place a heavy burden on young married mothers.

Unmarried adolescents often face more pronounced barriers in accessing maternal health services due to social stigma, discrimination, and legal restrictions. In many societies, cultural norms stigmatize unmarried adolescent pregnancies, leading to social exclusion and even restrictions on accessing reproductive health services. Studies by the United Nations Population Fund (UNFPA, 2020) and Patel et al. (2018) emphasize how unmarried adolescents encounter discrimination that discourages them from seeking essential maternal services, thus creating significant health disparities. This stigma, which can be intensified by religious and cultural beliefs, particularly in regions like sub-Saharan Africa and South Asia, contributes to limited healthcare access and poorer maternal health outcomes for unmarried adolescents.

In Kenya, and particularly in semi-rural regions like Rongai Sub County, these global patterns hold true but are compounded by specific cultural and religious beliefs that reinforce social exclusion for unmarried adolescent mothers. According to Save the Children Kenya (2020), unmarried pregnant adolescents in Kenya often face severe social and cultural barriers to

healthcare. These adolescents may be ostracized by their communities, limiting their ability to seek maternal services due to fears of judgment or discrimination. Consequently, unmarried adolescent mothers in Kenya are less likely to seek prenatal care or other essential maternal health services, which increases the risk of adverse health outcomes for both the mother and child.

Most literature to date has focused on either urban contexts or broader rural settings, highlighting general trends but leaving gaps in understanding the unique challenges faced by adolescents in semi-rural areas like Rongai Sub County. Studies have often lacked context-specific insights that account for the interplay between marital status, cultural norms, and healthcare access in these unique environments. This study addresses this gap by focusing specifically on how marital status intersects with psychosocial factors and maternal health service utilization among pregnant adolescents in Rongai Sub County, Nakuru. By exploring these intersections in a localized, semi-rural context, the research aims to provide data-driven insights that can inform policies and interventions tailored to the unique needs of pregnant adolescents in similar settings, thereby contributing to more equitable maternal healthcare outcomes.

2.2.3 Educational Attainment

Educational attainment plays a crucial role in determining maternal health service utilization. Research indicates that adolescents with higher levels of education are more informed about available health services and demonstrate higher rates of seeking regular antenatal care. This correlation is largely attributed to better health literacy and increased awareness of the importance of maternal care (Emina et al., 2014). Conversely, lower educational levels are linked to reduced utilization of maternal health services, primarily due to a lack of awareness and knowledge about available resources (Emina et al., 2014).

Globally, higher educational attainment and socioeconomic status are generally associated with improved maternal health outcomes. Access to education equips adolescents with the necessary information and resources to make informed decisions about their health, thereby positively impacting their maternal health practices (WHO, 2011). Educated adolescents are more likely to engage with health services proactively, contributing to better health outcomes.

Despite acknowledging the correlation between education and maternal health service utilization, there remains a significant gap in understanding how economic disparities within specific regions, such as Rongai Sub County, Nakuru, influence these patterns. The broader studies often aggregate data without considering regional variations in socioeconomic conditions and educational opportunities. This limitation leaves a gap in comprehending how localized economic and educational disparities specifically affect healthcare utilization among pregnant adolescents in semi-rural settings.

This study aims to address these knowledge gaps by focusing on the impact of educational attainment and socioeconomic status on maternal health service utilization specifically in Rongai Sub County. By examining how regional economic disparities and educational opportunities influence healthcare access, the study will provide a more granular understanding of these dynamics. Additionally, the research will explore how localized factors affect knowledge and utilization of maternal health services, thus informing more targeted interventions.

2.2.4Socioeconomic Status as a Social Determinant of Maternal Health Service Utilization

2.2.4.1 Education Attainment

Globally, the correlation between education and maternal health outcomes is widely documented, with education providing adolescents with critical health information, reducing risks during pregnancy, and increasing their likelihood of accessing comprehensive maternal services (World Health Organization [WHO], 2021). Studies across low- and middle-income countries, including regions in sub-Saharan Africa and South Asia, emphasize that women with secondary or higher education levels are significantly more likely to utilize maternal healthcare services than those with limited education (Mekonnen & Worku, 2021). This evidence underscores the potential of educational interventions to bridge gaps in maternal health service access and utilization, particularly among adolescents who are at higher risk for adverse maternal health outcomes.

However, while education is a vital factor, existing literature often aggregates data without fully exploring how socioeconomic conditions interact with educational attainment to impact maternal healthcare utilization in specific regional contexts. For instance, adolescents in rural or semi-rural areas, such as those in parts of East Africa, may face limited educational

opportunities due to socioeconomic challenges, which exacerbate disparities in healthcare access (Save the Children, 2021). These findings suggest a need for more localized studies that account for both educational and socioeconomic variations, as well as the availability of healthcare resources, which may vary significantly even within a single country or region.

In addition to individual health literacy, education influences perceptions around maternal health and helps adolescents overcome cultural and social barriers. Educated adolescents are often better equipped to resist stigma associated with seeking reproductive healthcare, thus improving their maternal health outcomes. The United Nations Population Fund (UNFPA, 2020) reports that educational attainment contributes not only to health awareness but also to empowerment, enabling adolescents to advocate for their health needs. However, in regions with minimal educational infrastructure or cultural constraints on female education, such empowerment and health benefits are limited, revealing significant gaps in maternal service utilization among less-educated adolescents.

This study aims to explore the relationship between educational attainment and maternal health service utilization within the local context of Rongai Sub County, Nakuru, Kenya. By examining how socioeconomic status and educational opportunities impact healthcare access for pregnant adolescents in this semi-rural setting, the study will provide a nuanced understanding of the barriers and facilitators unique to the local population. Through this localized approach, the study intends to uncover specific educational and socioeconomic challenges that impede service utilization, enabling the development of tailored interventions that address the unique needs of adolescents in Rongai Sub County. Ultimately, these findings will contribute to creating more equitable healthcare access by aligning interventions with the specific educational and socioeconomic conditions faced by adolescent mothers in semi-rural areas.

2.5. Socioeconomic Status

2.5.1 Support Arguments and Findings

Socioeconomic status (SES) is a critical determinant of access to and utilization of maternal health services. Lower SES is often associated with financial constraints that limit the ability to access quality healthcare. Research has consistently shown that economic barriers, such as the costs of transportation, healthcare services, and the inability to afford quality care,

significantly impede access to adequate maternal care (Izugbara et al., 2016). These financial constraints can lead to delayed or inadequate care, adversely affecting maternal and infant health outcomes.

Across various global contexts, lower SES is correlated with poorer maternal health outcomes due to limited access to healthcare services. Economic hardships often translate into difficulties in affording necessary healthcare, which can restrict access to timely and comprehensive maternal care (Izugbara et al., 2016). This highlights the importance of addressing socioeconomic barriers to improve health service utilization.

Despite acknowledging the impact of SES on maternal health service utilization, there is limited research focusing on how specific aspects of socioeconomic status, such as regional economic disparities, affect service utilization patterns. Much of the existing research aggregates data without delving into how localized economic factors influence access to maternal healthcare in specific settings, such as semi-rural or undeserved regions.

This study investigated how varying aspects of socioeconomic status, particularly economic barriers, affect maternal health service utilization in Rongai Sub County. By examining localized economic challenges and their impact on access to healthcare, the study will provide insights into the specific financial constraints faced by pregnant adolescents. This understanding informed the development of targeted interventions and policies designed to alleviate economic barriers and improve access to maternal health services in similar semi-rural contexts.

2.2.6. Geographic accessibility as a social determinant of service utilization among pregnant adolescents

Geographic accessibility remains a critical social determinant of maternal health service utilization, especially for pregnant adolescents. Studies show that limited access to healthcare facilities is a common barrier worldwide, impacting timely and adequate maternal care. Internationally, adolescents in rural and remote areas often face significant challenges, including long distances to health facilities, poor transportation, and inadequate healthcare infrastructure. These factors can lead to delayed or missed prenatal and postnatal care, with negative repercussions on both maternal and neonatal health outcomes (WHO, 2021). In many settings, mobile health units and community-based outreach programs have proven effective in bridging these geographic barriers by bringing maternal health services closer to underserved

areas. The success of these interventions has been well-documented, with WHO advocating their use to reach rural populations who lack proximity to formal healthcare facilities (Gogia & Sachdev, 2016).

In Africa, geographic access to healthcare services poses an especially formidable challenge due to vast rural regions, uneven distribution of healthcare resources, and inadequate infrastructure. Studies from sub-Saharan Africa emphasize that long distances to health facilities and high transportation costs deter pregnant adolescents from seeking essential maternal care (Babalola et al., 2021). Mobile health clinics have been implemented in countries such as South Africa and Nigeria, showing significant improvements in access to antenatal and delivery services. These mobile units reduce the distance barriers and provide consistent healthcare services to vulnerable populations, which has been instrumental in improving maternal health outcomes in remote and rural African communities (Okeke & Uzochukwu, 2022).

In Kenya, the geographic accessibility issue is particularly evident in rural and semi-rural areas, where infrastructure limitations create substantial barriers to maternal healthcare. The Kenya Demographic Health Survey (KDHS, 2022) reports that pregnant adolescents in rural counties often experience longer travel times to health facilities, which can discourage consistent use of antenatal care services. Efforts to address this challenge include government and NGO-supported mobile health units, which aim to deliver critical services like prenatal check-ups, immunizations, and health education directly to rural areas. Community health outreach programs, which involve locally-based healthcare workers delivering services and information at community levels, have shown positive impacts on maternal service utilization. However, the effectiveness of these interventions in semi-rural areas, such as Rongai Sub County, remains under-researched, leaving a knowledge gap regarding the specific needs and outcomes in these settings.

Locally, in Rongai Sub County and similar semi-rural areas within Nakuru County, pregnant adolescents often face geographic and logistical barriers that limit their access to maternal healthcare. Although some mobile health programs and outreach services have been initiated, their reach and sustainability remain inconsistent. Research focusing on this local context is essential for understanding how semi-rural geographic challenges differ from those in fully rural or urban areas. Studies that evaluate the performance of mobile health units and

community outreach in these semi-rural contexts could provide valuable insights for designing more effective maternal health interventions tailored to the local population.

This study addresses these gaps by examining the role of geographic accessibility in maternal health service utilization among pregnant adolescents in Rongai Sub County. By assessing the effectiveness of mobile health units and community-based outreach specifically in a semi-rural Kenyan setting, the research will offer insights into the successes and limitations of these interventions in local contexts. The findings aim to contribute to the development of culturally and geographically relevant strategies that could enhance maternal healthcare access in similar semi-rural settings across Kenya and sub-Saharan Africa.

2.3. Psychosocial Determinants of Maternal Health Service Utilization

2.3.1 Social Support Networks

Social support networks play a crucial role in facilitating maternal health service utilization. Adolescents with robust support systems, including family, peers, and community organizations, are more likely to access and use maternal health services. Such support provides essential emotional encouragement, practical assistance, and guidance in navigating the healthcare system (Kebede et al., 2021). These networks help mitigate stress and address barriers related to healthcare access.

Globally, strong social support networks are associated with improved healthcare-seeking behaviors among pregnant adolescents. Supportive environments, including acceptance from family and peers, significantly enhance adolescents' likelihood of accessing and utilizing maternal services (Patel et al., 2018). For instance, studies have shown that family support reduces the stigma associated with adolescent pregnancy and improves health outcomes (Patel et al., 2018).

While the importance of social support is well-documented, there is a limited understanding of how extended family structures and community cohesion specifically impact pregnant adolescents in conservative and semi-rural societies like Nakuru County, Kenya. The role of extended family and broader community dynamics remains underexplored, leaving gaps in how these factors influence service utilization.

This study will focus on the influence of extended family structures and community cohesion on maternal health service utilization in Rongai Sub County, Nakuru. By examining these social support networks in a conservative setting, the research aims to provide detailed insights into how broader support systems affect healthcare access and utilization, thereby informing more targeted support strategies.

2.3.2Mental Health

Mental health challenges, including depression, anxiety, and stress, play a crucial role in determining maternal health service utilization among adolescents. Globally, these mental health issues create significant barriers, leading to delays or complete avoidance of maternal healthcare, with detrimental impacts on maternal and neonatal health outcomes (Clark et al., 2019). The World Health Organization (WHO) emphasizes the need to address mental health in maternal care, highlighting that untreated mental health conditions can severely affect a mother's ability to access and adhere to healthcare services. Integrating mental health support within maternal health frameworks is essential for improving healthcare accessibility, ensuring comprehensive maternal care, and ultimately enhancing overall maternal health outcomes (WHO, 2021).

In Africa, where mental health services are often limited, adolescents face additional challenges in seeking maternal care due to the social stigma surrounding mental health issues. Studies indicate that young mothers experiencing mental health problems in sub-Saharan Africa are particularly vulnerable to adverse maternal health outcomes. This vulnerability is exacerbated by a lack of support systems, including limited access to mental health resources and societal attitudes that often stigmatize mental health issues (Adjorlolo & Chan, 2019). Moreover, the intersection of adolescent pregnancy and mental health challenges often results in social isolation, which further deters adolescents from accessing maternal services. Countries like South Africa and Ghana have initiated programs that integrate mental health counseling within maternal healthcare, yielding positive results in service utilization and health outcomes (Ogunleye & Owoaje, 2020). However, mental health integration within maternal health remains under-resourced and inconsistently implemented across the continent.

In Kenya, there is growing awareness of the mental health needs of pregnant adolescents, though comprehensive mental health services are still largely unavailable, particularly in rural and semi-rural areas. Research from the Kenya Health Policy 2014–2030 indicates that mental

health support within maternal health services is limited, especially for young mothers in remote regions (Republic of Kenya, 2014). Pregnant adolescents in these areas often face stigma, which discourages them from seeking mental health support and, by extension, maternal healthcare services. Recent studies suggest that adolescents in Kenya experience heightened levels of stress, depression, and anxiety during pregnancy, which are significant factors hindering their engagement with maternal health services. Mental health conditions among young mothers in Kenya can contribute to poor health outcomes, including an increased risk of postpartum depression and inadequate child health practices (Ndetei et al., 2020). However, most mental health initiatives remain centered in urban areas, creating an accessibility gap for rural populations.

Locally, in semi-rural areas like Rongai Sub County in Nakuru, pregnant adolescents face unique mental health challenges that impact their healthcare-seeking behavior. Socioeconomic hardships, isolation, and societal expectations contribute to high levels of anxiety and depression among young pregnant women in these communities. The lack of localized mental health services, coupled with limited maternal healthcare infrastructure, places these adolescents in a vulnerable position. Studies show that mental health support can improve healthcare-seeking behavior, but there is limited research specific to mental health needs and utilization patterns among adolescents in semi-rural Kenyan settings like Rongai. This localized context requires tailored interventions that address the distinct mental health challenges young mothers face in semi-rural areas, including stigma, social pressures, and access barriers.

This study addresses these gaps by investigating the prevalence and impact of mental health challenges on maternal health service utilization among pregnant adolescents in Rongai Sub County. By exploring mental health needs and their influence on healthcare access locally, the research provides critical insights into the importance of integrating mental health services within maternal healthcare. The findings will contribute to developing context-sensitive strategies that improve service utilization and health outcomes, ultimately informing policy changes to support adolescents facing mental health issues in similar semi-rural settings.

2.3.3 Cultural Beliefs

Cultural beliefs are deeply embedded in healthcare decisions worldwide. Research consistently shows that traditional beliefs and practices influence attitudes towards modern healthcare, affecting maternal health service utilization (Tangwa, 2018). For instance, studies conducted

in diverse communities across Africa, Asia, and Latin America indicate that healthcare-seeking behaviors are significantly influenced by cultural factors, including the role of family, community expectations, and spiritual beliefs (Iwelunmor et al., 2018; Bohren et al., 2019). In some cultures, traditional beliefs about pregnancy and childbirth may discourage women from seeking formal healthcare, particularly in the absence of culturally sensitive services.

Understanding cultural beliefs and practices and integrating them into maternal health programs can enhance service utilization, particularly in regions with strong cultural practices. Programs that have successfully incorporated cultural sensitivity tend to increase access to maternal health services by respecting and addressing local customs and beliefs (Iwelunmor et al., 2018). A study on culturally tailored interventions in indigenous communities in Guatemala demonstrated that involving local leaders and integrating indigenous birth practices significantly improved maternal health outcomes (Lori et al., 2020). Similar findings have been observed in other regions where traditional practices align poorly with biomedical approaches, underscoring the importance of culturally respectful interventions.

Adolescents may face unique challenges when accessing maternal health services, especially when traditional beliefs discourage young women from openly seeking antenatal care. Limited studies focus on adolescent populations in rural and semi-rural areas, despite their increased vulnerability to poor maternal health outcomes due to cultural and social stigmatization (Gebregziabher et al., 2019). Addressing adolescent maternal health through culturally informed strategies that account for intersectional factors, such as age, gender expectations, and social stigma, is critical for improving access and outcomes.

In semi-rural settings like Rongai Sub County, Kenya, specific cultural practices that influence maternal health service utilization are underexplored. Although some studies acknowledge the impact of cultural beliefs on maternal health, comprehensive studies detailing how these beliefs affect healthcare access in such settings are scarce. More context-specific research is needed to develop culturally sensitive maternal health programs that are relevant and acceptable to these communities (Lari et al., 2021). Additionally, intersectional factors, such as ethnicity, religion, and disability status, further complicate access to maternal health services and warrant focused research (Ganle et al., 2019).

Most studies examining maternal health service utilization focus on single time points, often

overlooking the evolution of healthcare-seeking behaviors from early pregnancy through postpartum care. Longitudinal research in semi-rural regions, including Rongai Sub County, would provide deeper insights into how behaviors change over time and how interventions can be adapted for sustained effectiveness. Furthermore, evaluations of youth-friendly services in rural Kenya should incorporate robust longitudinal data to ensure scalability and sustainability in resource-limited settings (Chersich et al., 2018).

This study aims to fill existing gaps by examining how cultural beliefs and practices influence maternal health service utilization among adolescents in Rongai Sub County. By understanding specific cultural factors, the research will inform the design of more culturally sensitive and effective maternal health programs. This context-specific analysis is expected to provide insights that promote equitable access to maternal health services for adolescents, ultimately contributing to the development of sustainable, culturally tailored healthcare strategies.

2.4.0 Sociodemographic Determinants of Maternal Health Service Utilization

2.4.1.Age as Social Demographic Determinantof Maternal Health Service Utilization

Age is a critical determinant of maternal health service utilization, with younger adolescents (ages 15-17) facing distinct challenges compared to older adolescents (ages 18-19). Research indicates that younger adolescents encounter significant barriers such as limited autonomy, lower health literacy, and heightened social stigma surrounding teenage pregnancy, which can impede their access to maternal health services (Ganchimeg et al., 2014). These barriers often result in delays in seeking essential prenatal and postpartum care.

Conversely, older adolescents typically exhibit higher rates of maternal health service utilization. This increase is attributed to their greater maturity, improved health literacy, and better access to resources, which contribute to more proactive engagement with maternal health services (Ganchimeg et al., 2014). In Kenya, particularly in regions like Rongai Sub County, Nakuru, younger adolescents experience higher pregnancy rates and face additional challenges in accessing reproductive health services due to cultural norms and societal expectations (KDHS, 2014; Ministry of Health, Kenya, 2022).

Globally, younger adolescents often face legal restrictions and social stigma related to early childbearing, which can further delay or deter them from seeking prenatal care (UNFPA, 2020).

Studies have shown that fears of disclosure and lack of support from family members contribute to these delays (WHO, 2011).

Existing research provides a broad understanding of the impact of age on maternal health service utilization, but it often lacks nuanced exploration of how intersecting factors such as socioeconomic status and educational attainment influence younger adolescents. Additionally, there is limited research on targeted interventions that effectively support younger adolescents in accessing maternal health services. The cultural and societal nuances specific to semi-rural areas like Rongai Sub County remain under explored.

This study addressed these gaps by examining the interplay of age with socioeconomic status and educational attainment in influencing maternal health service utilization among adolescents in Rongai Sub County. The study also explored how cultural and societal norms affect healthcare-seeking behaviors, providing a more detailed understanding of these dynamics in a semi-rural context.

Marital status plays a significant role in determining maternal health service utilization among adolescents. Globally, research indicates that married adolescents tend to have better access to maternal health services, largely due to the support from their spouses, who can provide emotional, financial, and logistical assistance. However, early marriage often brings challenges, including increased domestic responsibilities and financial strain, which can limit the consistency of healthcare access for young mothers (Kanyonga et al., 2020). Unmarried adolescents, on the other hand, frequently face barriers due to societal stigma, legal restrictions, and a lack of support systems. This is particularly evident in regions with conservative cultural norms, where unmarried pregnant adolescents are often marginalized, making it difficult for them to seek essential prenatal and postpartum care (UNFPA, 2020).

In Africa, marital status remains a strong determinant of healthcare-seeking behavior for pregnant adolescents, as social structures often emphasize the importance of family units in accessing resources. Married adolescents may benefit from spousal support, but early marriage has its own drawbacks. Studies in sub-Saharan Africa highlight that while married adolescents might have better access to health resources, they often experience restricted autonomy due to traditional gender roles, which can hinder timely healthcare access (Ojong et al., 2021). For unmarried adolescents, cultural and religious beliefs frequently exacerbate barriers, as pregnancy outside of marriage is commonly stigmatized. This stigma can lead to social

exclusion, preventing young mothers from accessing healthcare and placing them at a higher risk for adverse health outcomes (WHO, 2021).

In Kenya, marital status is a particularly significant factor in maternal healthcare access among adolescents, as it intersects with cultural expectations and economic factors. Married adolescents in Kenya often rely on their husbands' approval and support to access maternal health services, with studies showing that spousal involvement positively influences healthcare-seeking behavior (Kimani et al., 2019). Conversely, unmarried adolescents experience profound stigma and limited support, which directly impacts their health-seeking behavior. In conservative communities, young, unmarried mothers may be denied maternal healthcare or experience discrimination within healthcare facilities, discouraging them from attending prenatal appointments or seeking postpartum care (Save the Children Kenya, 2020). The intersection of marital status and cultural expectations can thus deeply affect adolescent mothers' access to essential services in Kenya.

Locally, in semi-rural settings like Rongai Sub County, Nakuru, marital status shapes the healthcare experience of pregnant adolescents in distinct ways. Adolescents who are married often face dual pressures—meeting family obligations while navigating healthcare access in a setting where facilities are limited. Additionally, for unmarried adolescents, cultural norms and social expectations present substantial barriers. In Rongai, unmarried pregnant adolescents may experience social isolation, family rejection, and judgment from the community, making them reluctant to seek maternal health services. The absence of targeted support for these adolescents exacerbates these challenges, highlighting a gap in locally responsive healthcare initiatives.

This study focuses on how marital status influences healthcare access and psychosocial well-being among pregnant adolescents in Rongai Sub County. By investigating the unique challenges that married and unmarried adolescents face in accessing maternal health services, the research provides insights into the social and cultural factors that influence healthcare-seeking behavior. Understanding these localized dynamics is essential for developing interventions that promote equitable access to maternal healthcare, addressing both the structural and social barriers experienced by adolescents based on their marital status. These insights contribute to a more comprehensive approach to maternal health services, tailored to address the needs of adolescents in semi-rural settings like Rongai.

2.4.3 Educational Attainment as Social Demographic Determinant of Maternal Health Service Utilization.

Educational attainment is a significant determinant of maternal health service utilization. Adolescents with higher educational levels are generally more informed about health services and demonstrate higher rates of seeking regular antenatal care (Emina et al., 2014). This is largely due to better health literacy and increased awareness of the importance of maternal care.

Globally, higher educational attainment is associated with better maternal health outcomes. Education equips individuals with the necessary information to make informed health decisions, thereby positively impacting their healthcare-seeking behaviors (WHO, 2011). Educated adolescents are more likely to engage proactively with health services, leading to better health outcomes.

Although the link between education and maternal health service utilization is well-documented, there is a lack of research focusing on how economic disparities within specific regions affect these patterns. Broader studies often overlook localized economic and educational disparities, leaving gaps in understanding how these factors influence healthcare utilization among pregnant adolescents in semi-rural settings.

This study explored the impact of educational attainment and socioeconomic status on maternal health service utilization specifically in Rongai Sub County. By focusing on regional economic disparities and educational opportunities, the research will provide a more detailed understanding of these dynamics and inform targeted interventions.

2.4.4 Socioeconomic Status as a Social Determination of Maternal Health Service Utilization.

Socioeconomic status (SES) is a critical determinant of maternal health service utilization. Lower SES is associated with financial constraints that limit access to quality healthcare. Economic barriers, such as transportation costs and inability to afford services, significantly impede access to adequate maternal care, leading to delayed or inadequate care and adverse health outcomes (Izugbara et al., 2016).

Globally, lower SES correlates with poorer maternal health outcomes due to limited access to healthcare services. Economic hardships often translate into difficulties in affording necessary

healthcare, underscoring the need to address socioeconomic barriers to improve service utilization (Izugbara et al., 2016).

Research often aggregates data on SES without examining how specific aspects of socioeconomic status, such as regional economic disparities, affect service utilization. This approach overlooks how localized economic factors influence access to maternal healthcare in specific settings.

This study will investigate how various aspects of socioeconomic status, particularly economic barriers, impact maternal health service utilization in Rongai Sub County. By examining localized economic challenges, the research will provide insights into specific financial constraints faced by pregnant adolescents and inform the development of targeted interventions.

2.5 Geographic Accessibility of Maternal Health Service Utilization.

Geographic accessibility is a significant determinant of maternal health service utilization. Adolescents in rural areas often face challenges such as transportation barriers and limited healthcare infrastructure, which can delay or prevent access to essential maternal care (WHO, 2011).

Globally, mobile health units and community-based outreach programs have proven effective in improving access to maternal services for rural populations. These programs help bridge the gap caused by geographic barriers by bringing services closer to underserved areas (WHO, 2011).

While evidence supports the impact of geographic accessibility on maternal health service utilization, there is limited research on the effectiveness of specific interventions like mobile health units in semi-rural settings. Most studies focus on broader rural contexts, leaving a gap in understanding how these interventions perform in specific semi-rural environments.

This study evaluated the effectiveness of mobile health units and community-based outreach programs in improving maternal health service access in Rongai Sub County. The research will provide insights into the efficacy of these interventions in semi-rural settings and identify areas for improvement.

2.6 Psychosocial Determinants of Maternal Health Service Utilization

2.6.1 Social Support Networks

Social support networks are crucial in shaping healthcare-seeking behaviors, especially for pregnant adolescents. Strong support systems that include family, friends, and community organizations provide essential emotional, informational, and logistical support, increasing access to maternal health services (Kebede et al., 2021). Globally, studies indicate that when pregnant adolescents receive support from family and peers, they are more likely to access prenatal, delivery, and postnatal care, contributing to improved health outcomes (Patel et al., 2018; Mulugeta et al., 2019). Social support helps alleviate fears, reduce stigma, and build confidence in navigating healthcare services, which can be especially impactful for young mothers facing cultural or social barriers.

In many cultures, the family unit plays a central role in influencing healthcare decisions for adolescents. Family support has been linked to reduced stigma surrounding adolescent pregnancy and greater acceptance of maternal health services, as families can provide practical assistance such as transportation and caregiving (Tadele et al., 2020). In African and Asian communities, where extended families are prevalent, grandparents and other family members often have an influential role in healthcare decisions, particularly in semi-rural and conservative societies (Mulugeta et al., 2019). However, studies also note that in conservative settings, family pressures and adherence to traditional practices can sometimes discourage adolescents from seeking formal healthcare, highlighting a complex interplay of support and restriction.

Beyond the family, community organizations and social groups offer critical support for maternal health access. In Latin America, for instance, community health worker programs have successfully increased maternal health service utilization by providing culturally relevant information and emotional support, helping young mothers feel more accepted within the healthcare system (Diaz et al., 2018). In some settings, community-led maternal health initiatives address specific cultural needs, creating safe spaces where pregnant adolescents can share experiences and receive guidance, thereby fostering a sense of belonging and reducing feelings of isolation (Patel et al., 2018). Community cohesion, defined as the trust and connectedness within a community, has also been linked to higher health service usage as people feel supported by a broader network.

While the importance of social support networks is documented, research on the role of extended family structures and community cohesion in semi-rural, conservative settings remains limited. Studies often overlook how cultural norms and collective decision-making within extended families can impact adolescents' maternal health choices. In some semi-rural

communities, where conservative beliefs may stigmatize adolescent pregnancy, family and community support may be influenced by concerns over social reputation or adherence to traditional gender roles, creating complex dynamics that can either promote or hinder healthcare utilization (Assefa et al., 2020). Understanding these dynamics in settings like Rongai Sub County is essential for designing maternal health programs that leverage community cohesion while respecting local values.

This study aims to address the gap by exploring the impact of extended family and community cohesion on maternal health service utilization in Rongai Sub County. By examining these factors in a conservative, semi-rural setting, the research seeks to provide insights into the unique social dynamics that influence healthcare access for pregnant adolescents. The findings are expected to inform the design of culturally sensitive programs that strengthen community and family support networks to promote equitable healthcare access. Recognizing and enhancing these support systems can lead to more effective and sustainable maternal health interventions, particularly in areas where cultural and social factors significantly shape healthcare behaviors.

2.6.2Mental Health

Mental health issues, such as depression and anxiety, significantly impact adolescents' ability to utilize maternal health services. Mental health challenges can lead to delays or avoidance of care, adversely affecting health outcomes (Clark et al., 2019).

Globally, there is increasing recognition of the impact of mental health on healthcare utilization. Integrated mental health support within maternal health services is essential to address these challenges and improve care access (Clark et al., 2019).

2.6.2.1 Impact of Adolescent Mental Health on Utilization of Maternal Health Services

According to Clark et al. (2019) studies which were conducted in a metropolitan area with diverse socioeconomic backgrounds, investigated how mental health issues, particularly depression and anxiety, affect adolescents' utilization of maternal health services. In this research employed a cross-sectional study design, utilizing both quantitative and qualitative data collection methods on adolescents aged 12-18, their caregivers, and healthcare providers. A purposive sampling method was used to select participants who had accessed maternal health services and exhibited symptoms of depression or anxiety. Clark et al. (2019) studies found

that adolescents with depression and anxiety were less likely to utilize maternal health services compared to their peers without mental health issues. Barriers identified included stigma associated with mental health, fear of judgment from healthcare providers, and a lack of understanding of available services. Despite some adolescents showing a willingness to seek help, logistical and emotional barriers often led to delays or avoidance of care.

Elsewhere other studies according to Smith & Lee (2018) investigated the impact of mental health on adolescents' utilization of general health services. They found similar patterns, with mental health issues leading to reduced service utilization and poorer health outcomes. Johnson et al. (2021) studies focused on a rural setting and found that mental health issues also significantly impacted service utilization, but highlighted additional barriers such as limited availability of local services and transportation issues. Brown & Davis (2020) examined the role of caregiver support in adolescents' health service utilization. They found that strong caregiver support could mitigate some negative impacts of mental health issues, but the lack of support still resulted in delayed care.

Despite acknowledgment of mental health barriers, research on specific mental health challenges faced by pregnant adolescents in semi-rural settings is insufficient. Most studies focus on broader contexts without addressing localized mental health issues.

This study will investigate the prevalence and impact of mental health issues among pregnant adolescents in Rongai Sub County. By focusing on local mental health challenges, the research will provide insights into the need for integrated mental health services within maternal care programs.

2.7 Cultural Beliefs

According to Tangwa (2018) cultural beliefs and practices profoundly influence attitudes toward modern healthcare and affect maternal health service utilization. Traditional beliefs may conflict with formal healthcare practices, impacting adolescents' willingness to seek necessary care. Culturally tailored health interventions have shown effectiveness in improving access to maternal health services by incorporating cultural sensitivity.

2.7.1 The Influence of Cultural Beliefs on Maternal Health Service Utilization

Tangwa (2018) explored the profound impact of cultural beliefs and practices on attitudes towards modern healthcare and how these beliefs affect the utilization of maternal health services. The study focused on the conflict between traditional cultural practices and formal healthcare systems, particularly among adolescents, and evaluates the effectiveness of culturally tailored health interventions. The study employed a mixed-methods research design and included adolescents aged 12-18, their caregivers, and local healthcare providers in a region with a rich cultural heritage, specifically focusing on communities where traditional beliefs are prevalent and deeply embedded in daily life.

Tangwa (2018) studies found out that traditional cultural beliefs often conflicted with modern healthcare practices, leading to reluctance or avoidance of maternal health services among adolescents. In utilization patterns the study noted that adolescents with strong adherence to traditional practices were less likely to utilize maternal health services. They were more likely to delay seeking care or avoid it altogether due to cultural constraints. In regards to Effectiveness of Interventions it was found out that culturally tailored health interventions, which incorporated aspects of traditional beliefs and practices, were effective in improving service utilization. These interventions helped bridge the gap between traditional practices and modern healthcare, making services more acceptable to the target population.

In other Comparative Studies globally, Smith & Johnson (2017) investigated the impact of traditional beliefs on maternal health service utilization in rural settings. Their findings were consistent with Tangwa (2018), showing that traditional beliefs led to reduced healthcare utilization. However, their focus was on rural areas with different cultural contexts.Nguyen et al. (2019) studies examined cultural competence in healthcare delivery in urban settings. They found that integrating cultural sensitivity improved healthcare access, but their study did not focus specifically on maternal health services or adolescent populations. Brown & Davis (2020) explored the impact of cultural beliefs on health behaviors among adolescents in multicultural urban environments. They observed similar patterns of cultural influence on health service utilization but did not focus on maternal health services. Martin et al. (2021) studies focused on the effectiveness of culturally tailored interventions for improving health service utilization in indigenous communities. They corroborated Tangwa's findings, showing that culturally sensitive approaches improved access to health services, but their study did not specifically address maternal health services or adolescent populations. Anderson et al. (2022) studies

investigated community-based strategies for integrating cultural beliefs into health interventions. They supported the effectiveness of culturally tailored approaches in enhancing healthcare access but did not specifically focus on maternal health services.

While cultural beliefs' impact on service utilization is recognized, comprehensive studies exploring specific cultural practices in semi-rural areas like Rongai Sub County are lacking. Detailed understanding of these factors is necessary for effective, culturally sensitive maternal health programs.

This study explored how cultural beliefs and practices in Rongai Sub County impact maternal health service utilization. Insights into specific cultural factors will help tailor maternal health programs to be more culturally acceptable and effective.

Tangwa (2018) contributes significantly to understanding how cultural beliefs impact the utilization of maternal health services among adolescents. The study highlights the importance of culturally tailored interventions in improving service access. However, further research is needed to address knowledge gaps related to long-term effects, adolescent-specific interventions, and the impact of diverse cultural contexts. Current research trends focus on enhancing cultural competency and integrating traditional practices with modern healthcare to improve overall health outcomes

2.8.0 Psychosocial Effects of Adolescent Pregnancy

2.8.1 Emotional Distress

Pregnant adolescents frequently experience higher levels of emotional distress than older mothers, with symptoms including depression, anxiety, and general psychological strain. Emotional distress in this context is defined as a combination of psychological challenges that disrupt daily functioning and overall well-being. Research consistently indicates that adolescent mothers are more vulnerable to mental health issues due to factors like social stigma, a lack of robust support systems, and the burden of adjusting to pregnancy alongside other life demands (Hen et al., 2007; Mbekenga et al., 2020). Hen et al. (2007) found that the prevalence of depressive symptoms in pregnant adolescents ranges from 30% to 50%, a significantly higher rate than that found in older pregnant women. These findings highlight the unique mental health risks faced by this population.

Emotional distress in pregnant adolescents is often fueled by financial instability, limited social support, and societal stigma. Adolescents face unique challenges when navigating pregnancy, such as disrupted education, strained family dynamics, and uncertain economic prospects, which can amplify their vulnerability to emotional distress. Maliki (2012) documented how financial instability and limited social support contribute to high levels of anxiety and depression in adolescent mothers. In many regions, adolescent mothers face judgment and stigma, which can lead to social isolation and exacerbate feelings of shame and helplessness. Studies in the United States and Sub-Saharan Africa have shown that adolescent mothers experience compounded mental health issues in contexts where cultural norms stigmatize young pregnancies (Sameroff & Rosenblum, 2016; Govender et al., 2019).

Social stigma and the absence of adequate social support play major roles in the mental health outcomes of pregnant adolescents. For example, stigma from peers, family members, and the community can lead to social isolation, which is a key risk factor for depression and anxiety in adolescent mothers (Mbekenga et al., 2020). A study in Brazil found that adolescent mothers who felt judged or unsupported by their families were more likely to exhibit symptoms of anxiety and depression (Dias & Teixeira, 2019). Additionally, the stigma surrounding adolescent pregnancy often discourages young mothers from seeking mental health support, as they may fear discrimination in healthcare settings (Govender et al., 2019).

Research in both high-income and low-income countries shows that adolescent mothers are more likely to suffer from emotional distress compared to their older counterparts. A study in Canada reported that adolescent mothers face substantial emotional stress due to the complex nature of adolescent development compounded by the demands of pregnancy and impending parenthood (Kingston et al., 2015). In contrast, a study in South Africa highlighted how the absence of youth-friendly healthcare and limited mental health services exacerbate psychological distress in adolescent mothers (Govender et al., 2019). The need for culturally appropriate mental health interventions is evident across different regions, as adolescent mothers' experiences vary significantly based on societal and cultural contexts.

While mental health services for pregnant adolescents remain limited in many parts of the world, research emphasizes the effectiveness of targeted interventions in reducing emotional distress. Peer support groups, mentorship programs, and mental health counseling can significantly reduce anxiety and depression among adolescent mothers. A study in the United

Kingdom demonstrated that mental health support tailored to the specific needs of adolescent mothers led to improvements in mental well-being and resilience (Johnson & Barrett, 2018). In Kenya, a youth-focused intervention program that provided social support and counseling to pregnant adolescents reduced depression rates by fostering a sense of community and belonging (Ngugi et al., 2021). However, there is still a critical need for more accessible mental health resources and youth-friendly services to address the specific psychological needs of pregnant adolescents.

Despite extensive research on adolescent maternal mental health, there remains a need for longitudinal studies that follow adolescents from pregnancy through postpartum to fully understand how emotional distress evolves over time. Furthermore, studies that explore the intersection of socioeconomic factors, cultural norms, and mental health in pregnant adolescents are limited, especially in low-resource settings. Such research would be valuable for developing targeted interventions that address both the immediate and long-term psychological needs of adolescent mothers.

2.8.2 Emotional Distress in Adolescent Pregnancy

Garcia et al. (2022) investigated the emotional distress experienced by pregnant adolescents, focusing on factors that contribute to mental health challenges such as depression and anxiety. The study aims to provide insights into the prevalence and severity of emotional distress in this population and the impact of socio-economic and support factors. The study found high levels of emotional distress among pregnant adolescents, with significant rates of depression and anxiety. Over 40% of participants reported moderate to severe symptoms of distress. Socio-economic factors, such as financial instability and lack of educational opportunities, were significant contributors to emotional distress. Additionally, social stigma and limited access to mental health resources exacerbated distress levels. Positive support from family and peers was associated with lower levels of emotional distress. Access to comprehensive prenatal care and mental health services also played a critical role in mitigating distress.

Smith & Lee (2021) examined emotional distress among adolescent mothers in rural settings. Similar to Garcia et al. (2022), they found high levels of emotional distress but identified additional stressors related to isolation and limited access to healthcare. Johnson et al. (2020) studies focused on urban adolescent mothers and reported comparable levels of distress. Their study highlighted the importance of educational and social support in managing emotional

health, aligning with Garcia et al. (2022) findings. Patel et al. (2023) studies investigated the impact of socio-economic factors on emotional distress in pregnant adolescents. They confirmed that financial instability and lack of support are significant contributors to mental health issues, supporting Garcia et al. (2022).Wilson & Carter (2024) studies analyzed coping strategies among pregnant adolescents and their impact on emotional distress. Their findings were consistent with Garcia et al. (2022), emphasizing the role of support systems in reducing distress. Adams & Lee (2023) explored the intersection of social stigma and emotional distress in adolescent pregnancies. They found that stigma significantly contributes to emotional distress, which aligns with Garcia et al. (2022) findings regarding the role of social stigma.

While these studies highlight the increased prevalence of emotional distress among pregnant adolescents, they often do not account for the longitudinal impact of these conditions. Additionally, there is a need for research focusing on the efficacy of specific interventions to alleviate emotional distress in this population.

The present study addressed these gaps by employing a mixed methods approach to track changes in emotional distress over-specific time and evaluated the effectiveness of targeted mental health interventions for pregnant adolescents.

2.8.3Stigma

Social stigma related to adolescent pregnancy can exacerbate psychosocial distress. Pregnant adolescents frequently encounter negative societal attitudes that can lead to social exclusion, diminished self-esteem, and increased stress.Kavanaugh and Schwarz (2013) noted that stigma related to adolescent pregnancy often manifests in the form of social isolation and discrimination, which can hinder adolescents from seeking necessary health services and support.Orme et al. (2015) documented that stigma impacts adolescent mothers' mental health, contributing to higher levels of stress and lower levels of social support.

2.8.3.1 Stigma and Its Impact on Adolescent Pregnancy

The stigma surrounding adolescent pregnancy significantly affects the mental health and emotional well-being of young mothers. Research consistently finds that stigmatization from family, peers, educational institutions, and healthcare providers leads to heightened levels of anxiety, depression, and social isolation among pregnant adolescents (Wilson & Carter, 2024; Garcia et al., 2022). For example, Wilson and Carter (2024) conducted a mixed-methods study

in a metropolitan area with a diverse adolescent population aged 15-19, examining the sources and impact of stigma. The study revealed that stigma arises from various sources—family expectations, peer judgment, and institutional attitudes—each contributing to the internalization of negative self-perceptions and increased emotional distress. Many adolescents coped through avoidance, denial, or selective support-seeking, but these coping mechanisms often proved insufficient in reducing stigma-related stress.

Several studies corroborate Wilson and Carter's findings, reinforcing the detrimental impact of stigma on pregnant adolescents' mental health. Garcia et al. (2022) investigated the emotional effects of stigma across different socio-economic groups, showing that economic hardship intensifies stigma-related emotional distress among adolescent mothers. Smith & Lee (2018) also explored the broader implications of stigma on healthcare utilization among pregnant adolescents, finding that stigma from healthcare providers and communities discourages young mothers from seeking essential prenatal and postnatal services. They emphasized the need for stigma-reduction measures within healthcare settings, which could improve adolescents' mental health and healthcare-seeking behaviors.

Similarly, Patel et al. (2023) analyzed the psychosocial challenges faced by pregnant adolescents, focusing on stigma as a key barrier to emotional well-being and healthcare access. Their findings aligned with Wilson and Carter's conclusions, demonstrating that stigma contributes to social withdrawal, low self-esteem, and reduced service utilization. This study also highlighted the importance of integrated mental health and social support services to help adolescent mothers cope with stigma-related challenges.

Johnson et al. (2021) examined stigma in urban settings, noting that adolescents in densely populated areas face amplified stigma due to heightened social visibility and scrutiny. The study recommended targeted interventions to address stigma, particularly in healthcare environments, to mitigate its adverse effects on service utilization and mental health. Adams & Lee (2023) further investigated the psychological impacts of stigma, confirming its negative influence on adolescents' coping strategies. This study emphasized that stigma leads to maladaptive coping responses, which in turn exacerbate emotional distress.

While these studies provide valuable insights into the effects of stigma, many tend to generalize stigma's impact across broad societal attitudes without examining specific cultural and community contexts. For instance, cultural norms regarding adolescent pregnancy can vary

significantly across regions and communities, shaping how stigma is experienced and internalized. There is limited research exploring how localized cultural beliefs and social expectations influence stigma among pregnant adolescents in semi-rural settings, such as Rongai Sub County, Kenya. Such localized research is essential, as cultural and social norms are likely to influence the forms and intensity of stigma, affecting both emotional well-being and healthcare-seeking behaviors.

The present study addresses this gap by examining the impact of localized cultural and social norms on stigma faced by pregnant adolescents in Rongai Sub County, Kenya. By focusing on the community-specific contexts, this research seeks to offer a nuanced understanding of stigma's impact on maternal health outcomes. Recognizing these localized factors can provide insights into effective, culturally sensitive strategies for reducing stigma and supporting adolescent mothers' emotional and healthcare needs

2.8.4 Social Isolation

Social isolation is another significant psycho social effect experienced by pregnant adolescents. The combination of stigma and lack of social support can lead to feelings of isolation and loneliness, which negatively impact mental health and maternal well-being

2.8.4.1 Social Isolation and Its Effects on ANC Utilization in Pregnant Adolescents

Social isolation is a critical factor that affects the healthcare-seeking behavior of pregnant adolescents, particularly ANC utilization. Isolation can stem from stigma, lack of support networks, and cultural beliefs, all of which may prevent young mothers from accessing necessary care. Mthembu et al. (2020) explored this issue in South Africa, where cultural stigma and insufficient familial support contributed significantly to social isolation. Through focus groups and in-depth interviews, the study found that adolescents facing isolation often lacked the encouragement and resources needed to seek ANC. Social isolation in this context was influenced by community norms that stigmatize adolescent pregnancy, which in turn discouraged young mothers from attending ANC appointments.

Studies from different regions reinforce Mthembu et al.'s findings, showing the pervasive impact of social isolation on ANC utilization among pregnant adolescents. Njeri et al. (2023) conducted research in Kenya, combining surveys and interviews to investigate how social isolation affects ANC access. The study highlighted that adolescents in rural areas with limited social networks face additional barriers, including geographic and logistical challenges, which

exacerbate the effects of isolation. Adolescents without support were more likely to forgo ANC, resulting in poorer maternal and neonatal health outcomes.

Smith et al. (2021) examined the issue of social isolation among pregnant adolescents in the United States, showing that stigma and lack of social support often discourage young mothers from attending regular ANC appointments. Using a mixed-methods approach, the study combined surveys with qualitative interviews, revealing that isolation-related stigma in urban settings similarly reduces service utilization. Additionally, Baker et al. (2022) conducted a cross-sectional study in the United Kingdom and found a significant correlation between social isolation and lower ANC attendance. The study used statistical analysis to demonstrate that adolescents experiencing high levels of isolation reported lower attendance rates, suggesting that social connections play an essential role in maternal healthcare-seeking behavior.

Social isolation does not only impact ANC utilization but also exacerbates mental health issues in pregnant adolescents. Gavin et al. (2018) highlighted that social isolation in pregnant adolescents is closely associated with adverse mental health outcomes, such as increased risks of depression and anxiety. Adams et al. (2020) further emphasized that limited social support networks contribute to emotional distress, with negative effects on both mental and maternal health outcomes. Their study pointed out that adolescents without sufficient support systems are at risk of experiencing heightened psychological distress, which can discourage them from engaging with healthcare services.

While these studies provide valuable insights, most focus on general aspects of social isolation and support networks without exploring the specific types of support that most effectively mitigate isolation. Additionally, there is limited research on how social isolation and the effects of support networks vary across different cultural and geographic settings. For instance, the role of extended family, community organizations, and peer networks might differ significantly depending on cultural and rural versus urban environments. Understanding these variations can help tailor ANC interventions to better address isolation in diverse settings.

This study addresses these gaps by investigating the specific types of social support that effectively reduce social isolation among pregnant adolescents in Rongai Sub County, Kenya. By examining variations in support and their impact on emotional well-being and maternal health, the research aims to provide a context-specific understanding of how to mitigate social isolation and improve ANC utilization. Recognizing these localized factors will inform the development of culturally sensitive support interventions that can enhance maternal health outcomes in similar semi-rural settings.

2.9 Psycho social Interventions in Enhancing Maternal Health Service Utilization Among Pregnant Adolescents

The objective of this literature review is to evaluate the effectiveness of various psychosocial interventions in improving maternal health service utilization among pregnant adolescents. The review aimed to identify the types of psychosocial interventions that have been implemented, their impact on maternal health behaviors, and the overall outcomes of these intervention

Psychosocial interventions are designed to support pregnant adolescents by addressing emotional, social, and psychological challenges that often hinder maternal health service utilization. These interventions typically include counseling, peer support, educational workshops, and community-based initiatives. Research suggests that such interventions can positively impact adolescents' mental health and encourage consistent antenatal care (ANC) utilization.

Njeri et al. (2023) evaluated a psychosocial intervention in Kenya, combining peer counseling with educational workshops to improve maternal health service utilization. The study found that adolescents who participated in the intervention showed increased ANC attendance and greater awareness of maternal health resources. The intervention leveraged culturally relevant materials and local support networks, making it more accessible to adolescents in rural settings.

Jones et al. (2021) conducted a randomized controlled trial in the United States to assess a comprehensive psychosocial intervention program aimed at enhancing social support for pregnant adolescents. The program included counseling, peer support groups, and educational workshops. Results showed a significant improvement in ANC utilization and a reduction in postpartum depression rates. This study demonstrated the effectiveness of interventions that combine emotional support with educational resources, particularly in urban and suburban areas where social support may be fragmented.

In the United Kingdom, Brown et al. (2022) examined a psychosocial intervention focused on mental health support and educational outreach. The study revealed that integrated support services, including mental health counseling and practical assistance, led to better maternal outcomes and higher rates of ANC visits. These findings underscore the importance of addressing mental health concerns alongside antenatal education, as mental health support is directly linked to healthcare-seeking behaviors.

Wang et al. (2019) reviewed global interventions targeting psychosocial distress among

pregnant adolescents, finding that mental health counseling and social support programs effectively reduce stress, anxiety, and depressive symptoms. This review noted that interventions providing both individual counseling and community-based support networks were especially effective in encouraging regular healthcare utilization among pregnant adolescents.

Jiang et al. (2021) focused on community-based interventions, such as peer support groups and educational workshops, designed to reduce stigma and improve mental health access for pregnant adolescents. The study, conducted in East Asia, highlighted how community support mechanisms can decrease the stigma associated with adolescent pregnancy, ultimately leading to better maternal health outcomes. Mthembu et al. (2020) also explored a community-based approach in South Africa that included home visits and peer support for pregnant adolescents. Their findings aligned with Jiang et al., demonstrating that stigma reduction efforts, coupled with accessible support services, can improve ANC attendance among adolescents in rural settings.

While these studies indicate the effectiveness of psychosocial interventions, there are knowledge gaps regarding the long-term impacts and cultural adaptability of these programs. Most studies focused on short-term outcomes, with limited information on sustained effects on maternal health behaviors post-pregnancy. Additionally, many interventions lack specificity in addressing the unique challenges faced by adolescents in semi-rural or isolated areas, where access to resources and support networks may differ significantly from urban settings. Research is also needed to understand which aspects of psychosocial interventions (e.g., counseling, peer support, community involvement) are most impactful in different cultural and geographic contexts.

To address these gaps, the present study evaluates psychosocial interventions tailored to the needs of pregnant adolescents in Rongai Sub County, Kenya. By assessing the long-term impacts and culturally specific elements of these interventions, this research aims to provide evidence-based recommendations for enhancing maternal mental health support in similar semi-rural settings. This approach will contribute valuable insights on the effectiveness of localized interventions, enabling better alignment with the social and cultural needs of pregnant adolescents.

2.9.1 Summary and Conclusion

Pregnant adolescents face significant psychosocial challenges, including emotional distress, stigma, and social isolation. While existing research provides valuable insights into these issues, there are notable gaps in understanding how these factors interact with localized cultural and social contexts. The present study aimed to address these gaps by examining the prevalence and severity of psychosocial effects in Rongai Sub County and evaluating the effectiveness of tailored psychosocial interventions.

By providing a comprehensive analysis of psychosocial factors and their impact on maternal health service utilization, this study will contribute to the development of targeted strategies and policies to support pregnant adolescents in semi-rural settings.

2.10 Association between Psychosocial Effects and Antenatal Care Utilization in Rongai Sub-County, Nakuru County, Kenya

Antenatal care (ANC) is a vital service for ensuring the health of both mother and child. Effective ANC utilization is linked to improved maternal and infant outcomes, yet the decision to seek and maintain ANC services is influenced by a myriad of factors. Psychosocial factors, including emotional stress, social isolation, and mental health issues, play a crucial role in shaping an adolescent's likelihood of attending ANC appointments. This section reviews the association between these psychosocial effects and ANC utilization in the context of Rongai Sub-County, Nakuru County, Kenya, incorporating global and local perspectives and identifying knowledge gaps addressed by this study.

2.10.1 Psychosocial Factors Affecting Antenatal Care Utilization

Psychosocial factors encompass emotional, social, and psychological aspects that can significantly impact health behaviors. For adolescents, these factors are particularly pronounced due to their developmental stage and social circumstances. Key psychosocial factors influencing ANC utilization include:

2.10.1Emotional Stress

Emotional stress is a critical barrier affecting maternal health service utilization among pregnant adolescents worldwide. Research has shown that pregnancy-related concerns, financial instability, and complex family dynamics often lead to heightened stress levels, which can prevent adolescents from seeking regular antenatal care (ANC) services. High levels of

stress are commonly linked to decreased ANC attendance and adverse health outcomes for both mother and baby (Graham et al., 2018).

A global review by Fisher et al. (2019) found that stress related to adolescent pregnancy often results from a lack of support from partners and families, societal stigma, and the uncertainty surrounding motherhood. These factors significantly reduce adolescents' engagement with ANC services, as emotional stress can become overwhelming, inhibiting the motivation to attend appointments and seek needed care.

In South Asia, studies conducted by Singh et al. (2020) reveal that pregnant adolescents experiencing stress from socio-economic pressures and family expectations often face additional psychological challenges, including anxiety and depression, which further affect their ANC attendance. Adolescents dealing with financial hardships and family conflicts may feel isolated, leading to increased emotional stress that hampers their ability to prioritize ANC.

In African settings, where adolescent pregnancy is often stigmatized, emotional stress from social disapproval can significantly affect healthcare-seeking behaviors. A study by Akintola et al. (2019) in Nigeria indicated that emotional stress from familial rejection and financial pressures were primary barriers to consistent ANC visits among pregnant adolescents. Emotional stress, exacerbated by limited support systems and a lack of financial resources, often discouraged adolescents from attending ANC due to fear of judgment and lack of practical assistance.

Research from South Africa by Mkhize et al. (2021) similarly highlights that adolescents facing high emotional stress often delay or avoid ANC services. In particular, adolescents who experience stress from partner absence or family conflict are less likely to attend ANC appointments due to the compounded burden of psychological and financial strain.

In East Africa, pregnancy-related stress among adolescents is commonly related to family pressure, economic hardship, and community stigma. Wambugu et al. (2022) conducted a study in Tanzania, showing that adolescent mothers frequently struggle with emotional stress linked to financial insecurity and social judgment, impacting their likelihood of seeking regular ANC services. In Uganda, Nakalembe et al. (2020) found that family conflicts often create stressful environments for adolescent mothers, further decreasing their motivation to access healthcare

services. The emotional stress associated with these issues can hinder consistent ANC attendance, reducing maternal health outcomes.

In Kenya, pregnant adolescents often face high levels of stress due to economic instability, social stigma, and strained family relationships. According to Mwangi et al. (2021), adolescents who experience stress from family rejection and financial insecurity are less likely to attend ANC services. The researchers found that the stress of balancing personal needs with financial challenges exacerbates their reluctance to seek care. Adolescents often lack the support systems needed to manage these stressors, making them vulnerable to adverse health outcomes.

In Nakuru County, emotional stress among pregnant adolescents has been found to significantly impact their ANC attendance. Kariuki et al. (2023) observed that adolescents in Nakuru County face unique stressors, such as family rejection and limited access to financial support, which hinder their ability to consistently attend ANC. This study revealed that emotional stress, coupled with a lack of supportive family structures, creates barriers to maternal health services, as adolescents may feel overwhelmed by their circumstances. The study underscores the need for supportive interventions that address both the emotional and practical challenges these adolescents face.

Despite evidence linking emotional stress to decreased ANC utilization, there is limited research exploring how specific sources of stress—such as familial conflicts, economic insecurity, and social stigma—interact to influence maternal health outcomes. Many studies treat stress as a generalized factor without examining the compounded effects of intersecting stressors on adolescent mothers' healthcare decisions.

This research seeks to address these gaps by examining how different stressors, including family dynamics, financial instability, and social stigma, interact to affect ANC attendance among pregnant adolescents in Nakuru County, Kenya. By using a mixed-methods approach, the study will provide a more nuanced understanding of how emotional stress impacts maternal health service utilization, highlighting the need for integrated support systems and interventions tailored to adolescents' specific needs.

2.10.2 Social Isolation

Social isolation, defined as a lack of supportive relationships and limited social connections, is

a significant barrier to healthcare access for pregnant adolescents. Pregnant adolescents who lack family or peer support often experience emotional distress and have fewer resources to navigate healthcare systems. This isolation contributes to inconsistent ANC attendance, which can lead to adverse health outcomes for both the mother and the child.

Smith et al. (2020) conducted a study in the United States that highlighted how social isolation impacts ANC attendance among pregnant adolescents. The research demonstrated that adolescents without supportive networks had lower ANC attendance rates compared to those with strong support from family or friends. Social isolation often resulted in reduced motivation to attend appointments, with adolescents reporting feelings of loneliness and stress as primary barriers. This study underscores the need for targeted interventions to mitigate social isolation and improve access to ANC services.

Similarly, Mthembu et al. (2020) studied the effects of social isolation among pregnant adolescents in South Africa. Through focus groups and interviews, the study found that cultural stigma surrounding adolescent pregnancy contributed to social isolation, further discouraging ANC utilization. Adolescents without family or community support felt ostracized, making it difficult for them to seek healthcare. This research suggests that culturally sensitive interventions that foster community and family support could be critical in reducing social isolation and increasing ANC attendance.

In Kenya, Njeri et al. (2023) explored the impact of social isolation on ANC utilization in rural settings. The study used surveys and interviews to assess the experiences of pregnant adolescents and found that limited social support networks were a major barrier to healthcare access. Adolescents in rural areas faced additional challenges, such as transportation difficulties and a lack of local healthcare resources, which exacerbated their isolation. This study highlights the need for locally adapted support systems to address the unique barriers faced by adolescents in rural communities.

Research has consistently shown that strong social support networks play a vital role in mitigating the negative effects of social isolation. Jones et al. (2021) evaluated a psychosocial support program in the United States that provided peer support groups and counseling for pregnant adolescents. The program successfully reduced feelings of isolation, leading to improved ANC attendance. Adolescents with access to peer networks reported feeling less isolated, more motivated, and better supported in navigating pregnancy-related healthcare.

Similarly, Garcia et al. (2019) in Brazil assessed the influence of family and community support on ANC attendance among pregnant adolescents. The study found that adolescents with strong family bonds and community connections were more likely to access ANC services regularly. These findings indicate that fostering family and community involvement can play a crucial role in reducing social isolation and encouraging consistent healthcare utilization.

Social isolation also has broader impacts on the mental health of pregnant adolescents, which can further affect healthcare-seeking behaviors. According to Johnson et al. (2018), social isolation is associated with increased risks of depression and anxiety among pregnant adolescents, factors that negatively impact ANC attendance. Their study, conducted in Canada, revealed that mental health counseling and social support significantly improved mental health outcomes and healthcare utilization.

Adams et al. (2020) emphasized that the absence of social support contributes to a cycle of isolation, poor mental health, and reduced healthcare access. Adolescents facing social isolation often lack both emotional support and practical assistance, making it difficult to attend ANC appointments consistently. The study suggested that interventions addressing both social isolation and mental health could have a synergistic effect in improving maternal health outcomes.

While these studies illustrate the importance of addressing social isolation to improve ANC utilization, there is limited research exploring the long-term effectiveness of social support interventions. Additionally, few studies have examined how social isolation intersects with other factors, such as socioeconomic status, cultural norms, and geographic location, particularly in semi-rural and rural settings. More research is needed to understand how localized and culturally specific support systems can be developed to effectively address the unique challenges of pregnant adolescents in various contexts.

The present study seeks to explore the impact of social isolation on ANC utilization among pregnant adolescents in Rongai Sub County, Kenya. By examining the specific social and cultural factors contributing to isolation in this community, the research aims to provide insights that could guide the development of culturally sensitive interventions to support pregnant adolescents and enhance ANC attendance.

2.10.3Mental Health Issues

Mental health conditions such as depression and anxiety are increasingly recognized as significant challenges among pregnant adolescents. These conditions not only affect the well-

being of the adolescents themselves but also influence their engagement with maternal health services, including antenatal care (ANC). Research indicates that mental health issues are associated with lower rates of ANC utilization and adverse health outcomes for both mothers and infants (Jones et al., 2019). The stigma surrounding mental health exacerbates these issues, leading to underutilization of available services.

Globally, mental health issues among pregnant adolescents are prevalent and detrimental to their health outcomes. In a systematic review, Baker et al. (2021) emphasized that adolescents experiencing high levels of anxiety and depression are less likely to attend ANC appointments regularly. This pattern is particularly pronounced in low- and middle-income countries, where mental health resources are often scarce, and stigma surrounding mental health can deter individuals from seeking help.

In high-income countries, psychosocial factors also play a critical role. Research conducted in the United States by Taylor et al. (2022) found that pregnant adolescents with inadequate social support were significantly less likely to receive adequate prenatal care. The study underscored the necessity of integrating mental health support into ANC services to improve health outcomes for this vulnerable population.

In Kenya, particularly in Rongai Sub-County, Nakuru County, local studies have identified psychosocial factors as significant barriers to ANC utilization. Mthembu et al. (2020) found that financial instability and family conflicts contribute to heightened emotional stress among pregnant adolescents, adversely affecting their ability to attend ANC appointments. Such stress is compounded by social isolation and the stigma associated with adolescent pregnancy, further hindering access to necessary care (Ndlovu et al., 2019).

Dlamini et al. (2021) highlighted the importance of culturally sensitive approaches to enhance ANC uptake among adolescents. Their research indicated that cultural norms and systemic barriers play a crucial role in shaping the experiences of pregnant adolescents in accessing maternal health services. This suggests that interventions must be tailored to the local context to effectively address these psychosocial barriers

Despite existing research, several knowledge gaps persist. Firstly, there is limited understanding of how specific psychosocial factors interact to influence ANC utilization. Many studies tend to isolate individual factors rather than exploring the complex interplay between emotional stress, social support, and mental health issues.

For instance, while individual studies have shown that anxiety and depression adversely impact ANC attendance, they often do not consider how these mental health conditions may be exacerbated by social isolation or lack of familial support. This calls for a more integrated approach to research that examines the cumulative effects of these psychosocial challenges.
Furthermore, there is a lack of comprehensive research on effective interventions that address psychosocial barriers to ANC utilization in diverse settings, particularly in low-resource environments like Rongai Sub-County. While some interventions have been proposed, their effectiveness in improving ANC utilization rates among adolescents has not been thoroughly evaluated.

The present study aims to address these gaps by employing a mixed-methods approach to explore the multifaceted relationship between psychosocial factors and ANC utilization in Rongai Sub-County. By combining quantitative surveys to assess the prevalence of psychosocial issues among pregnant adolescents with qualitative in-depth interviews, the research seeks to provide a nuanced understanding of how emotional stress, social isolation, and mental health issues collectively impact ANC behaviors.
Based on the findings, the study proposes targeted interventions designed to address identified psychosocial barriers. These interventions will be tailored to the local context, incorporating culturally sensitive approaches and leveraging existing support systems to enhance ANC utilization.

The complex interplay between psychosocial effects and ANC utilization necessitates a comprehensive understanding of the determinants influencing pregnant adolescents' healthcare-seeking behaviors. This study aims to fill these gaps and inform the development of effective, context-specific interventions that improve mental health support and enhance ANC utilization in Rongai Sub-County, Kenya.

2.11Barriers and Facilitators to Maternal Services Utilization in the Context of Psychosocial Effects of Adolescent Pregnancy: Insights from Rongai Sub-County, Nakuru County, Kenya

2.11.1 Introduction

Understanding the barriers and facilitators to maternal services utilization, particularly in the context of adolescent pregnancy, is essential for improving health outcomes in regions like

Rongai Sub-County, Nakuru County, Kenya. Adolescents face unique challenges in accessing and utilizing maternal health services, which can significantly impact their health and that of their infants. This section examines common barriers and facilitators to maternal services utilization, supported by both local and global perspectives, and discusses how the study addresses the existing knowledge gaps.

2.11.2 Barriers to Maternal Health Services Utilization

Barriers to accessing maternal health services among adolescents are multifaceted and often intertwined with psychosocial factors. Key barriers include:

2.11.3Financial Constraints as Barriers to Maternal Services Utilization

The objective of this literature review is to examine how financial constraints act as barriers to maternal health service utilization among pregnant adolescents. It aims to evaluate the extent to which economic factors influence the accessibility and quality of maternal health services and to compare findings from various studies to identify effective strategies for mitigating these barriers.

2.11.4 The Impact of Financial Constraints on Maternal Health Service Utilization Among Pregnant Adolescents

Financial constraints are recognized as significant barriers to accessing maternal health services worldwide, particularly for pregnant adolescents. The costs associated with prenatal care—such as transportation, medications, and service fees—are substantial, and many adolescents lack the financial resources to cover these essential expenses. This lack of resources can severely limit access to healthcare services necessary for ensuring healthy pregnancies and improving maternal and infant outcomes.

Research conducted across various global contexts consistently highlights the detrimental effects of financial barriers on maternal health service utilization. For example, in a study conducted in rural India, Patel et al. (2021) found that the high costs of healthcare, coupled with low household incomes, led to decreased utilization of maternal health services among adolescents. The study emphasized the need for community support systems to alleviate these financial burdens and enhance service access.

In Latin America, a comprehensive review by Herrera et al. (2022) indicated that financial constraints, particularly out-of-pocket expenses and lack of insurance coverage, significantly impacted prenatal care attendance among pregnant adolescents. The authors suggested that targeted subsidies and public health initiatives could help bridge these gaps, enabling better access to essential services for marginalized populations.

In Africa, financial constraints have been identified as a primary obstacle to maternal health service utilization, particularly in low-income settings. In Nigeria, Nwafor et al. (2023) reported that the high cost of healthcare services, combined with inadequate financial support systems, resulted in lower antenatal care attendance among pregnant adolescents. Their findings highlight the importance of implementing community-based support programs that can address financial barriers and improve access to care.

Research in East Africa further underscores the financial challenges faced by pregnant adolescents. For instance, in Tanzania, Wambura et al. (2022) found that transportation costs and service fees were major deterrents to accessing maternal health services. The study recommended the introduction of financial assistance programs that could alleviate the economic burden on adolescents, thereby increasing their likelihood of attending antenatal care appointments.

In Kenya, financial barriers significantly hinder access to maternal health services, especially in regions like Rongai Sub-County, where poverty rates are high, and financial support mechanisms are limited (Moyer & Mustafa, 2014). Research by Kariuki et al. (2023) found that adolescents often struggle with the costs associated with prenatal care, which can lead to delayed or missed appointments, adversely affecting maternal and infant health outcomes.

Brown et al. (2023) emphasized that high healthcare costs and transportation expenses deter adolescents from seeking necessary prenatal care in Kenya. Their study highlighted the potential role of community-based support programs in alleviating some of these financial pressures, suggesting that such initiatives could enhance service utilization among financially constrained populations.

Similarly, Williams et al. (2022) noted that the lack of health insurance and high out-of-pocket costs are substantial financial barriers affecting prenatal care access in Kenya. Their findings

underscore the urgent need for improved financial assistance mechanisms and policy reforms to facilitate better access to maternal health services for adolescents.

In Nakuru County, financial constraints have a profound impact on the utilization of maternal health services among pregnant adolescents. Local studies indicate that many adolescents face significant financial challenges that prevent them from accessing essential prenatal care. According to Muturi et al. (2023), the high costs of transportation and healthcare services in Nakuru exacerbate the already challenging economic conditions faced by these young mothers, leading to decreased utilization of ANC services.

Despite the presence of community-based programs aimed at addressing financial barriers, the effectiveness of these initiatives remains inconsistent. Kumar et al. (2024) found that while some relief was provided by community support programs, their impact varied significantly, suggesting the need for ongoing evaluation and adaptation of these initiatives to better meet the needs of pregnant adolescents in Nakuru County.

Despite the considerable body of research on financial constraints and maternal health service utilization, significant gaps remain. Firstly, there is limited understanding of how various financial barriers interact and collectively influence service utilization among pregnant adolescents. Much of the existing literature has focused on individual barriers without adequately exploring the compounded effects of multiple financial challenges.

Secondly, longitudinal studies that assess the long-term effects of financial constraints on maternal health outcomes are scarce. Understanding these long-term implications is crucial for developing effective interventions and policies.

Lastly, there is insufficient research evaluating the effectiveness of specific financial assistance programs and their direct impact on service utilization. Comprehensive evaluations are necessary to identify the most effective strategies for mitigating financial barriers for pregnant adolescents.

This study aims to explore how various financial barriers interact and affect overall maternal health service utilization among pregnant adolescents in Nakuru County. By employing a mixed-methods approach, the research will assess the prevalence of financial constraints and their influence on accessing prenatal care. Surveys will provide quantitative data on financial

barriers, while in-depth interviews will offer qualitative insights into the lived experiences of pregnant adolescents navigating these challenges.

The findings of this research will contribute to a deeper understanding of the interplay between financial constraints and maternal health service utilization. Ultimately, this study aims to inform the development of targeted financial assistance programs and policy reforms that enhance access to essential maternal health services for pregnant adolescents.

2.12 Lack of Transportation on Maternal Health Service Utilization

Access to transportation is a critical factor influencing maternal health service utilization, particularly among pregnant adolescents in rural settings. In many low- and middle-income countries, inadequate transportation options can significantly hinder access to antenatal care (ANC) and other essential maternal health services. This literature review evaluates recent studies to understand the extent of transportation-related barriers globally and identifies effective strategies for improving access to maternal health services.

Transportation challenges are a prominent barrier to accessing maternal health services. For instance, Gibson et al. (2022) conducted a study in Kenya that revealed how a lack of transportation options impedes maternal health service utilization among pregnant adolescents. Their findings indicated that transportation issues led to missed ANC appointments and delayed access to necessary health services, exacerbating health risks for both mothers and infants.

In rural India, O'Brien et al. (2023) reported similar challenges, noting that limited access to reliable transportation significantly affected the attendance of antenatal care. The study emphasized that geographic isolation and poor infrastructure restrict access, resulting in lower utilization rates among pregnant adolescents. Such findings highlight the critical need for improved transportation infrastructure to facilitate better access to maternal health services.

In Bolivia, Martinez et al. (2023) found that long travel distances and the absence of public transport were major obstacles to accessing maternal health services in remote areas. Their research underscored the importance of addressing transportation barriers to improve health outcomes for pregnant adolescents, suggesting that investment in transportation infrastructure could lead to better maternal health service utilization.

Harris et al. (2023) investigated transportation barriers in isolated Australian communities, illustrating that geographic isolation and inadequate transportation infrastructure critically hinder timely access to maternal healthcare. The study revealed that these barriers could lead to adverse maternal and infant health outcomes due to delayed care, further emphasizing the importance of reliable transportation in healthcare access.

In Africa, the impact of transportation on maternal health service utilization is particularly pronounced. Many rural communities lack the necessary infrastructure, leading to significant challenges in accessing healthcare services. Research has shown that pregnant adolescents are often unable to reach healthcare facilities due to the absence of reliable transportation. For example, in a study conducted in Ethiopia, Tesfaye et al. (2022) found that long distances to health facilities and inadequate transport options were major barriers to ANC attendance among adolescents.

Similarly, in Nigeria, a study by Adeyemi et al. (2022) revealed that transportation issues significantly affected the ability of pregnant adolescents to access maternal health services. Their findings indicated that the reliance on public transport, which is often unreliable and overcrowded, deterred adolescents from attending essential prenatal care appointments.

In Kenya, the situation is no different. The lack of reliable transportation options is a significant impediment to maternal health service utilization, particularly in rural areas like Rongai Sub-County. Research conducted by Moyer and Mustafa (2014) emphasizes that geographic distance from health facilities and inadequate transportation infrastructure contribute to lower rates of ANC attendance and higher maternal health risks.

Gibson et al. (2022) highlighted the critical nature of these transportation challenges in Kenya, noting that the absence of accessible transportation options led to missed appointments and delayed care. This underscores the need for targeted interventions that improve transportation access for pregnant adolescents.

Despite valuable insights into transportation barriers, several gaps remain in the current literature. Many studies tend to focus on transportation issues in isolation, without adequately examining how these barriers interact with other factors such as financial constraints and social stigma. While research identifies transportation as a significant obstacle, it often overlooks how

financial difficulties or societal stigma can compound these issues, leading to a more complex understanding of barriers to maternal health service utilization.

Moreover, there is limited research on the effectiveness of specific interventions designed to improve transportation access for pregnant adolescents. Existing literature lacks comprehensive evaluations of programs aimed at mitigating transportation barriers, making it challenging to determine best practices and effective strategies.

Additionally, there is a scarcity of longitudinal studies assessing the long-term effects of transportation barriers on maternal and infant health outcomes. Understanding these long-term implications is essential for grasping the broader impact of transportation access on health trajectories.

This study aims to explore how transportation barriers interact with other obstacles—such as financial constraints and social stigma—to affect maternal health service utilization among pregnant adolescents in Rongai Sub-County. By adopting a mixed-methods approach, the research will provide a nuanced understanding of the interplay between various barriers and their impact on service access. Surveys will quantify the prevalence of transportation challenges, while qualitative interviews will offer insights into the lived experiences of pregnant adolescents facing these barriers.

The findings will contribute to a more comprehensive understanding of the challenges faced by pregnant adolescents in accessing maternal health services and will inform the development of integrated, context-specific interventions that address the multifaceted nature of transportation barriers. This comprehensive approach will ultimately aim to enhance maternal health outcomes in rural settings by improving access to essential services.

2.13. Social Stigma on Maternal Health Service Utilization

Social stigma associated with adolescent pregnancy can significantly affect service utilization. Pregnant adolescents may face judgment and discrimination from their communities, families, and healthcare providers, which can discourage them from seeking and continuing care (Kariuki et al., 2023). The fear of stigma can lead to avoidance of health facilities and under utilization of available services.

2.13.1The Impact of Social Stigma on Maternal Health Service Utilization Among Pregnant Adolescents

Social stigma surrounding adolescent pregnancy has consistently emerged as a barrier to the utilization of maternal health services worldwide. Pregnant adolescents may encounter judgment and disapproval from family members, communities, and even healthcare providers, which can create hesitancy to seek essential maternal healthcare. This literature review explores the influence of social stigma on maternal health service utilization, comparing perspectives from global, African, East African, Kenyan, and Nakuru County contexts.

In many parts of the world, social stigma surrounding adolescent pregnancy significantly limits adolescents' access to maternal health services. In the United States, Brown et al. (2023) studied low-income communities, revealing that social stigma from both family and healthcare providers reduced adolescents' willingness to engage with prenatal care services. This stigma often resulted in delayed access to prenatal care, compounding health risks for both mother and child. Similarly, studies in Southeast Asia, such as those conducted by Nguyen et al. (2021), found that adolescent girls faced criticism from healthcare staff and community members, which negatively impacted their health-seeking behavior. In this setting, stigma not only discouraged regular antenatal visits but also contributed to a higher prevalence of mental health challenges, affecting adolescents' engagement with healthcare services.

Social stigma is also a pronounced barrier to maternal health service utilization among adolescents in Africa. A study by Smith et al. (2022) in rural Nigeria found that adolescent pregnancy is often associated with shame, and pregnant adolescents frequently avoid seeking care due to fear of discrimination. This stigma leads to decreased rates of antenatal care attendance, limited support during childbirth, and heightened health risks for both the adolescent mother and her infant. In urban South Africa, Lee et al. (2023) revealed that adolescents experiencing social stigma had diminished mental well-being and lacked support from healthcare providers. The negative perceptions of adolescent pregnancy, compounded by healthcare discrimination, further inhibited these adolescents from accessing services.

In East Africa, social stigma toward pregnant adolescents presents significant obstacles to maternal health care. For instance, Omondi et al. (2022) reported in Uganda that adolescent girls commonly experience judgment from healthcare providers, making it challenging for

them to utilize antenatal care (ANC) services effectively. This stigma, often reinforced by community norms, also deters adolescents from discussing their pregnancies, which reduces their access to community health resources. In Tanzania, Musa et al. (2021) found that cultural expectations further isolate pregnant adolescents, affecting their ANC attendance and maternal outcomes.

Within Kenya, societal and familial stigma heavily impacts pregnant adolescents' use of maternal health services. Kariuki et al. (2023) found that stigma from families, communities, and healthcare providers led many pregnant adolescents to avoid health facilities, reducing ANC attendance and resulting in delayed or insufficient prenatal care. This is further complicated by the lack of adolescent-friendly health services, which exacerbates stigma and feelings of isolation, leaving pregnant adolescents without necessary support. According to Mwangi et al. (2022), healthcare providers in Kenya often hold negative attitudes toward adolescent pregnancies, which discourages adolescents from seeking care due to fear of judgment.

In Nakuru County, stigma similarly impedes access to maternal healthcare for pregnant adolescents. Wambua et al. (2023) observed that social stigma in Nakuru is deeply embedded within community norms, where adolescent pregnancy is viewed as shameful and often associated with moral failure. This perception discourages adolescents from openly seeking healthcare services, leading to missed ANC appointments and lack of adequate maternal care. In rural areas within Nakuru, stigma can be even more pronounced, as community members may publicly disapprove of adolescent pregnancies, causing adolescents to feel alienated. The compounded stigma from community and family can delay healthcare access, ultimately affecting maternal health outcomes in the region.

Social stigma does not act in isolation but intersects with other barriers such as financial difficulties and transportation limitations, further complicating adolescents' access to maternal health services. Studies in Kenya, such as by Kariuki et al. (2023), reveal that stigma amplifies financial barriers by discouraging adolescents from seeking community or family support, which would help cover healthcare-related expenses. Additionally, stigma may interact with transportation barriers, as fear of judgment can deter adolescents from traveling to healthcare facilities, particularly if they lack family support or safe transport options.

While current studies have illuminated the impact of social stigma on maternal health service utilization, there is a need for more comprehensive research exploring how stigma interacts with financial and transportation barriers. Existing literature largely treats stigma as a separate issue, limiting a holistic understanding of the challenges pregnant adolescents face in accessing maternal healthcare. Longitudinal studies assessing the long-term health implications of these compounded barriers, as well as the effectiveness of stigma-reduction interventions, remain scarce.

This study aims to address these gaps by examining how social stigma intersects with other barriers to maternal health service utilization among pregnant adolescents in Nakuru County, Kenya. Using a mixed-methods approach, it will analyze the prevalence of stigma and its relationship with financial and transportation challenges, providing a nuanced understanding of the obstacles these adolescents face. By capturing the complexities of these interactions, the study will inform the design of culturally sensitive and multi-faceted interventions, ultimately aiming to improve maternal health outcomes for pregnant adolescents.

2.13.0Facilitators of Maternal Services Utilization

Facilitators that enhance maternal services utilization among adolescents include:

2.14.1.Strong Social Support Networks

A robust social support network, comprising family, friends, and community members, plays a critical role in encouraging adolescents to seek and sustain maternal health care. Such networks provide multifaceted support, which is vital for overcoming barriers to accessing maternal services.

2.12.3 Emotional Support

Emotional support from family and friends plays a crucial role in mitigating feelings of anxiety and stigma associated with adolescent pregnancy. For pregnant adolescents, navigating the complexities of pregnancy can be overwhelming, particularly when faced with societal stigma and potential isolation. The encouragement and reassurance provided by a supportive social network foster a positive attitude toward seeking regular maternal care, which is essential for both physical and mental well-being.

Research has demonstrated that emotional support significantly influences healthcare utilization among pregnant adolescents. Nolan et al. (2021) highlighted that emotional reinforcement from family and friends can alleviate anxiety and promote a sense of empowerment in seeking maternal health services. Their study found that adolescents who felt supported were more likely to attend antenatal care (ANC) appointments regularly and engage actively in their health management.

In addition to reducing anxiety, emotional support can counteract feelings of stigma often experienced by pregnant adolescents. Studies show that stigma can deter individuals from seeking necessary health services, as they may fear judgment or discrimination from healthcare providers and the community (Smith et al., 2022). However, when adolescents receive encouragement and validation from their social circles, they may perceive maternal health services as more accessible and less daunting, leading to improved health-seeking behaviors.

Globally, the importance of emotional support in maternal health has been recognized across various contexts. For example, a study in the United States by Brown et al. (2023) indicated that pregnant adolescents who reported higher levels of emotional support from family members were more likely to attend prenatal care appointments consistently. The study emphasized the role of supportive family dynamics in fostering positive health behaviors among adolescents.

Similarly, in urban South Africa, Lee et al. (2023) found that social support networks significantly influenced the utilization of maternal health services. Their research indicated that pregnant adolescents who felt supported by friends and family experienced lower levels of stress and were more likely to engage with healthcare providers, ultimately leading to better health outcomes.

In low-resource settings, the significance of emotional support is further underscored. In rural India, O’Brien et al. (2023) reported that pregnant adolescents with strong social support networks demonstrated higher rates of ANC attendance, attributing this to the encouragement and reassurance received from their families. The study highlighted the need for interventions that bolster social support systems to enhance maternal health service utilization.

While current literature provides valuable insights into the role of emotional support, there remain gaps in understanding how to effectively leverage these support systems to improve

maternal health outcomes. Future research should explore the specific characteristics of emotional support that are most beneficial, as well as how healthcare providers can foster supportive environments for pregnant adolescents.

Moreover, interventions aimed at increasing emotional support should be integrated into maternal health programs. Initiatives that engage families and communities in supporting pregnant adolescents can enhance their access to healthcare services. For instance, community-based programs that educate family members about the importance of maternal health services can foster a more supportive environment for pregnant adolescents, ultimately improving healthcare utilization.

In conclusion, emotional support is a critical factor influencing maternal health service utilization among pregnant adolescents. By recognizing the importance of supportive social networks and implementing strategies to enhance these connections, healthcare systems can significantly improve the health outcomes of adolescents during pregnancy. This holistic approach to maternal health recognizes that emotional well-being is intertwined with physical health and is essential for fostering consistent engagement with healthcare services.

2.12.4Practical Assistance

Practical assistance from social networks, such as family members and friends, plays a vital role in overcoming the logistical and financial barriers that pregnant adolescents often face when accessing maternal health services. While emotional support is important for psychological well-being, practical help—such as providing transportation or financial assistance—can make a substantial difference in ensuring that adolescents can regularly attend antenatal care (ANC) appointments and access other necessary services.

Research has shown that the availability of practical support helps alleviate significant barriers to healthcare access. For instance, Brown et al. (2022) found that adolescents who received practical support from family members, such as assistance with transportation or covering healthcare costs, were more likely to attend their ANC appointments consistently. The study emphasized that access to reliable transportation and financial aid was particularly crucial for those living in rural or underserved areas, where healthcare facilities may be distant or expensive to reach.

Practical assistance not only helps with the immediate logistical challenges but also reduces the stress associated with these barriers, allowing pregnant adolescents to focus on their health and well-being. In many cases, the absence of such support can lead to missed appointments, delayed care, and ultimately worse health outcomes for both mothers and infants.

Globally, the importance of practical assistance in improving maternal health service utilization has been recognized across various settings. In rural India, O'Brien et al. (2023) found that pregnant adolescents who had access to transportation support were significantly more likely to attend ANC appointments. The study highlighted that reliable transportation options allowed adolescents to overcome the geographical isolation that often hinders access to healthcare in rural regions.

In sub-Saharan Africa, a study by Moyer & Mustafa (2014) highlighted that financial assistance from family members or community groups helped pregnant adolescents cover the costs associated with healthcare visits, including transportation and service fees. In these regions, the lack of financial resources is often a key barrier to accessing essential maternal health services. Practical support from social networks can mitigate these challenges, ensuring that pregnant adolescents can seek regular care and reduce the risk of complications during pregnancy.

Similarly, in the United States, Brown et al. (2022) reported that pregnant adolescents in low-income neighborhoods who received practical assistance, such as transportation or childcare support, had higher rates of prenatal care attendance. The study emphasized that practical help from family and friends could offset the economic burdens associated with pregnancy and improve overall healthcare utilization.

Although emotional support is crucial, the practical assistance provided by social networks is indispensable for ensuring that pregnant adolescents can access maternal health services regularly. Interventions aimed at improving maternal health outcomes should recognize the importance of both emotional and practical support. Healthcare systems could collaborate with local community groups to develop programs that provide financial and logistical assistance to pregnant adolescents. These programs might include transportation vouchers, subsidies for medical costs, or community-driven transportation services to help adolescents attend their ANC appointments.

Furthermore, healthcare providers can play a role in encouraging family involvement by educating families on the importance of supporting pregnant adolescents in accessing healthcare. By promoting practical assistance alongside emotional support, healthcare systems can address a wider range of barriers, improving the frequency and consistency of maternal healthcare visits.

Practical assistance from social networks is a critical determinant of maternal health service utilization among pregnant adolescents. Providing support with transportation, financial costs, and other logistical barriers can significantly improve adolescents' ability to attend ANC appointments and access timely care. As maternal health programs and policies evolve, integrating both emotional and practical support will be essential for ensuring that pregnant adolescents, particularly in underserved areas, can access the care they need for healthy pregnancies and positive health outcomes.

2.12.5 Community Involvement

Community-based support networks, including local organizations and health programs, further enhance service utilization by providing additional resources and support structures. Programs that involve community members in supporting pregnant adolescents can offer valuable resources such as mobile clinics, educational workshops, and home visits, addressing both practical and informational needs (Baird et al., 2019).

In summary, strong social support networks are essential in facilitating maternal health service utilization among adolescents. They provide both emotional and practical assistance, helping to overcome barriers and encouraging regular engagement with healthcare providers. Future research should continue to explore the ways in which these networks can be strengthened to further support adolescent maternal health**.**

2.12.6Access to Education and Information

Access to education and information plays a pivotal role in improving maternal health outcomes, particularly for adolescents. Knowledge about the importance of antenatal care (ANC), available healthcare services, and reproductive health rights can empower pregnant adolescents to seek timely medical attention, ultimately reducing maternal and infant morbidity and mortality. Comprehensive sexual and reproductive health education equips adolescents

with the necessary tools to make informed decisions about their health, and it can significantly enhance maternal health service utilization. This literature review draws on global, African, East African, and local studies to understand the impact of education and information on maternal health service utilization and identify strategies to improve access to these resources.

Globally, several studies have demonstrated the importance of education and information in improving maternal health service utilization. In the United States, Miller et al. (2021) emphasized the role of comprehensive sex education programs in increasing the utilization of maternal health services among adolescents. These programs not only provide critical information about the importance of ANC but also address potential barriers such as misinformation, myths, and stigma surrounding pregnancy. Adolescents who receive proper sexual and reproductive health education are more likely to seek prenatal care services and follow recommended health protocols, contributing to better health outcomes.

Similarly, a study by Lee et al. (2022) in Brazil highlighted that access to accurate, culturally relevant sexual and reproductive health information led to improved attendance at ANC appointments. Their research found that when adolescents were educated about the risks of neglecting maternal healthcare, they were more motivated to engage with healthcare systems. In countries like Brazil, where there are diverse cultural norms, the study emphasized the importance of tailoring health education materials to the local context to ensure maximum effectiveness.

In India, a study by Patel et al. (2023) indicated that providing adolescents with information through peer education programs significantly improved their understanding of maternal health and increased ANC attendance rates. The study found that peer-led education initiatives were particularly effective in reaching marginalized adolescents who might otherwise have limited access to formal health education programs.

In Africa, the relationship between access to education and maternal health service utilization is equally critical. A study by Kaboré et al. (2022) in Burkina Faso revealed that the lack of access to maternal health education led to low rates of ANC attendance among pregnant adolescents. In rural areas, the study found that pregnant adolescents often lacked knowledge about the significance of regular check-ups and the available healthcare services, leading to delayed care and increased health risks. The study stressed the need for community-based education programs to address this gap.

In East Africa, Wambui et al. (2023) conducted research in Uganda, showing that maternal health education programs significantly improved adolescent engagement with ANC services. Their findings indicated that when adolescents received education through schools, community health workers, or mass media campaigns, they were more likely to attend regular ANC visits and make informed decisions regarding their pregnancies. The study also noted that information delivered through multiple channels—such as mobile health technologies, community meetings, and educational workshops—was particularly effective in overcoming barriers to access in rural communities.

In Kenya, a study by Ochieng et al. (2022) found that school-based education programs in rural regions improved the utilization of maternal health services among pregnant adolescents. The study noted that adolescents who had access to formal education about sexual and reproductive health were more likely to engage with ANC services and seek support from healthcare professionals. These findings highlight the potential for integrating maternal health education into the school curriculum, especially in rural and underserved areas.

In Nakuru County, where access to maternal health services can be influenced by geographical and socio-economic barriers, the role of education and information in promoting ANC utilization is also significant. A study conducted by Njenga et al. (2023) in Nakuru County highlighted that while many pregnant adolescents were aware of ANC services, there was a noticeable gap in detailed knowledge about the importance of regular visits and the specific services available. The study indicated that adolescents often missed ANC appointments due to a lack of understanding of its benefits, compounded by misinformation and myths about pregnancy and childbirth.

The study emphasized the need for tailored educational interventions that specifically address adolescent pregnancy in Nakuru County. This includes integrating reproductive health education into the school curriculum and conducting targeted community outreach programs. Furthermore, ensuring that information is provided in accessible formats (e.g., local languages and visual aids) was identified as a key factor in improving its effectiveness.

In response to these findings, the county government and local NGOs have started implementing community-based educational programs, aiming to equip adolescents with essential knowledge about maternal health. These initiatives have shown promising results,

particularly in rural areas of Nakuru County, where there has been an increase in ANC attendance among adolescents who participated in these educational programs.

While existing studies demonstrate the positive impact of education and information on maternal health service utilization, significant gaps remain. Much of the research on this topic has focused on the provision of information without sufficiently exploring how to make this information more accessible to adolescents in remote and underserved areas. Further research is needed to understand the best methods for delivering maternal health education to adolescents, particularly in low-resource settings.

Moreover, studies that explore the long-term effects of maternal health education on adolescent behavior and health outcomes are scarce. Longitudinal studies are necessary to assess whether improved education leads to sustained increases in ANC utilization and better maternal and infant health outcomes.

Education and information are crucial factors in improving maternal health service utilization among adolescents. Comprehensive, culturally sensitive, and accessible maternal health education programs can empower adolescents to seek regular ANC services, reducing risks to both maternal and infant health. Globally, and particularly in Africa, there is a growing recognition of the importance of integrating sexual and reproductive health education into community and school-based programs. In Nakuru County, targeted interventions that deliver accessible, accurate information to adolescents can significantly enhance their engagement with maternal health services, leading to improved health outcomes. Future research should focus on refining educational strategies, assessing their long-term impact, and ensuring that information is delivered effectively to all adolescents, regardless of geographical or socio-economic barriers.

2.12.7Community-Based Health Programs

Community-based health programs have emerged as an effective strategy to improve maternal health service utilization, especially in underserved and rural populations where access to healthcare facilities is limited. These programs often integrate maternal care with other supportive services, such as psychosocial support, health education, and logistical assistance, to address the multifaceted barriers that pregnant adolescents face. The goal of these programs is to enhance accessibility, provide comprehensive care, and empower individuals within the

community to take an active role in improving their maternal health outcomes. This literature review explores the impact of community-based health programs on maternal health service utilization, with a global, African, East African, and local focus on Nakuru County, Kenya.

Globally, community-based health programs have been recognized as a critical component of improving maternal health outcomes. In rural India, a study by Sharma et al. (2023) demonstrated that home visit programs by trained health workers significantly improved maternal health service utilization, including antenatal care (ANC) and postnatal care. These programs not only provided education about the importance of regular health visits but also addressed practical barriers such as transportation and financial difficulties by offering services at the doorstep. The study showed that home visits helped build trust between healthcare providers and pregnant women, leading to more consistent care and better health outcomes.

Similarly, in Latin America, community health programs have proven effective in reaching marginalized populations. A study by Garcia et al. (2022) in rural Peru found that community outreach programs, which included mobile clinics and education campaigns, increased ANC attendance rates and reduced maternal and infant mortality rates. These programs also provided essential services such as immunizations, family planning, and prenatal screenings, thus addressing multiple aspects of maternal health in a holistic manner.

In Sub-Saharan Africa, community-based health programs have been pivotal in improving maternal healthcare access. A study by Kone et al. (2022) in Côte d'Ivoire showed that integrating maternal health services with other community-based health services, such as child health and nutrition programs, resulted in higher utilization of ANC and safer childbirth practices. The study emphasized that these programs facilitated timely referrals to healthcare facilities for high-risk pregnancies, helping to reduce complications and adverse health outcomes.

In many African countries, community-based health programs have proven to be especially effective in improving maternal health service utilization among pregnant adolescents. A study by Ngugi et al. (2022) in Kenya highlighted the success of community health workers (CHWs) who conducted home visits to provide maternal health education, monitor pregnancies, and refer women to health facilities when necessary. The study found that these programs helped overcome barriers related to transportation, geographical isolation, and lack of knowledge about available services, leading to increased ANC attendance and better maternal health

outcomes. CHWs also played a vital role in addressing psychosocial needs, providing counseling, and reducing the stigma often associated with adolescent pregnancy.

In Tanzania, the integration of mobile health (mHealth) technologies with community-based programs has been shown to improve maternal health outcomes. A study by Mwakanyamale et al. (2023) found that mobile health services that provided appointment reminders, health tips, and telemedicine consultations improved ANC attendance among pregnant women, particularly those living in remote areas. These programs also empowered adolescents by giving them access to health information and virtual consultations with healthcare providers, which helped mitigate the effects of geographical and financial barriers.

In East Africa, particularly Kenya, community-based health programs have been instrumental in improving maternal health service utilization among pregnant adolescents. In regions like Nakuru County, where access to healthcare facilities can be limited, these programs are essential for providing accessible and continuous care. A study by Odhiambo et al. (2023) in Nakuru County found that community-based interventions, such as mobile clinics and community health outreach programs, significantly increased the uptake of maternal health services among adolescents. These programs were effective in providing early prenatal care, reducing the number of home deliveries, and increasing institutional births. The presence of trained community health volunteers who acted as health educators and support agents played a crucial role in improving the utilization of maternal health services.

A similar study in rural Nakuru by Mwangi et al. (2022) emphasized the importance of mobile clinics in addressing transportation barriers. The study found that mobile health services that traveled to remote areas for regular ANC appointments significantly improved health outcomes for pregnant adolescents, many of whom would otherwise not have attended health facilities due to distance or cost. Mobile clinics provided basic prenatal check-ups, health education, and referrals to higher-level facilities for more specialized care, ensuring that pregnant adolescents received continuous maternal care throughout their pregnancies.

In addition to logistical and educational support, community-based health programs also provide critical psychosocial support to pregnant adolescents. A study by Brown et al. (2023) in Zambia highlighted that community programs that integrated counseling and emotional support services improved adolescent mental well-being and maternal health service utilization. The provision of psychosocial support through group counseling sessions and peer

support networks helped reduce the stigma associated with adolescent pregnancy and encouraged adolescents to seek timely medical care.

In Nakuru County, similar programs that included peer support groups and counseling services were found to reduce feelings of isolation and anxiety among pregnant adolescents. These programs also helped adolescents manage the stress of pregnancy by providing them with coping mechanisms and access to mental health services when needed.

Despite the successes of community-based health programs, there remain gaps in the literature regarding their long-term effectiveness and scalability. Much of the research has focused on short-term outcomes, such as increased ANC attendance, but there is limited understanding of the sustained impact of these programs on maternal and infant health outcomes. Longitudinal studies are needed to assess the long-term benefits of community-based interventions, especially in terms of maternal and infant morbidity and mortality rates.

Furthermore, there is a need for more research on how to optimize the integration of psychosocial support into community-based health programs. While mental health services are often included, their integration and effectiveness in improving health outcomes for pregnant adolescents remain underexplored.

Community-based health programs play a crucial role in improving maternal health service utilization, particularly for pregnant adolescents in rural and underserved areas. These programs help overcome barriers related to transportation, financial constraints, and geographical isolation, while also providing vital psychosocial support. Globally and within the African context, evidence suggests that integrating maternal care with community-based outreach services, mobile clinics, and educational programs can significantly enhance service utilization and improve health outcomes. In Nakuru County, community-based programs have proven effective in addressing local challenges and increasing access to maternal health services. Future research should focus on the long-term impact of these programs and explore ways to strengthen the integration of psychosocial support services to ensure comprehensive care for pregnant adolescents.

2.8 Theoretical Perspectives

Understanding the psychosocial effects of adolescent pregnancy and its impact on maternal service utilization requires a robust theoretical framework. This study incorporates three key theories: Problem Behavior Theory (PBT), Erik Erikson's Psychosocial Developmental Theory, and Gerald Caplan's Crisis Theory. Each offers unique insights into the challenges faced by pregnant adolescents and their interactions with maternal health services.

2.8.1 Problem Behavior Theory (PBT)

Problem Behavior Theory (PBT), as articulated by Boyer (2016), views adolescent pregnancy as a manifestation of problematic behavior influenced by various social structural elements. PBT asserts that social factors such as education, family structure, socioeconomic status, and peer influence significantly shape adolescent behaviors. Boyer (2016) emphasizes that these factors contribute to the development of a personality system influenced by motivational, belief, and self-control factors, and how individuals perceive their environment.

Recent research supports PBT's relevance in understanding adolescent pregnancy. Studies by Babalola (2014) and Tremblay & Frigon (2014) highlight how social contexts and structural elements, including familial and peer support, impact adolescent behavior and decision-making. Adolescent pregnancies are often linked to issues such as inadequate parental supervision, peer pressure, and limited access to educational resources, which aligns with PBT's framework. By focusing on these social determinants, PBT provides a lens to understand how adolescents navigate their environment and engage in behaviors that may lead to pregnancy.

2.8.2 Erik Erikson’s Psychosocial Developmental Theory

Erik Erikson's Psychosocial Developmental Theory posits that human development occurs in eight stages, each characterized by a specific psychosocial conflict. Erikson (2013) suggests that successful resolution of these conflicts results in positive developmental outcomes, while failure leads to difficulties in later stages.

Adolescence, Erikson’s fifth stage, involves the conflict between Ego Identity and Role Confusion (Erikson, 2013). During this period, individuals struggle with identity formation and role expectations, crucial for transitioning into adulthood. Hjelle and Ziegler (2011) note that many adolescents experience identity crises, leading to feelings of confusion and disorientation.

Teenage pregnancy can exacerbate these issues by disrupting identity development and role exploration. Sadler and Catrone (2013) found that adolescent parents often face challenges in forming a stable identity and navigating the expectations of motherhood. This developmental crisis may hinder their ability to fully engage with maternal services and achieve positive outcomes. Erikson's theory provides a framework to understand how adolescent pregnancy can create additional conflicts and impede successful resolution of identity issues.

2.8.3 Gerald Caplan's Crisis Theory

Gerald Caplan's Crisis Theory offers a critical perspective on how adolescents cope with crises. Caplan (1964) posits that crises occur when individuals face significant stressors that overwhelm their coping mechanisms. In the context of adolescent pregnancy, the crisis may arise from the sudden and profound changes in social roles, personal identity, and expectations.

Caplan’s theory helps elucidate why pregnant adolescents may experience heightened psychological distress and struggle with accessing maternal services. The theory suggests that the intensity of the crisis impacts an individual’s ability to seek and utilize support effectively. Given the substantial life changes associated with pregnancy, understanding these crisis dynamics is essential for addressing barriers to maternal health services and providing appropriate support.

2.8.3.4Conclusion

Combining PBT, Erikson's Psychosocial Developmental Theory, and Caplan's Crisis Theory offers a comprehensive framework for understanding the psychosocial determinants of adolescent pregnancy and its impact on maternal services utilization. By integrating these theories, this study aims to provide a nuanced analysis of how social structures, identity development, and crisis management influence the experiences of pregnant adolescents in Rongai Sub County. The insights gained will contribute to more effective interventions and support mechanisms tailored to the specific needs of this population.

2.8.4Theoretical Framework

Understanding the psychosocial effects of adolescent pregnancy and its influence on maternal services utilization requires a robust theoretical framework. This study employs an integrated theoretical approach combining Problem Behavior Theory (PBT), Erik Erikson's Psychosocial

Developmental Theory, and Gerald Caplan's Crisis Theory. This synthesis provides a comprehensive perspective on how psychosocial factors shape the experiences of pregnant adolescents in Rongai Sub County, Nakuru, Kenya.

2.8.4.2Problem Behavior Theory (PBT)

Problem Behavior Theory (PBT) posits that adolescent pregnancy can be viewed as a problematic behavior resulting from complex interactions between individual traits and social structural elements. According to Boyer (2016), PBT emphasizes that adolescent behaviors, including pregnancy, are influenced by a constellation of social factors such as education, family dynamics, peer influence, and socioeconomic status. These social determinants form a personality system that drives behavior and interacts with perceived environmental support, such as parental and peer support.

In the context of adolescent pregnancy, PBT helps explain how social structural factors contribute to behaviors leading to pregnancy and affect the subsequent utilization of maternal services. Adolescents facing inadequate support or adverse social conditions may exhibit problematic behaviors, including early pregnancy, which can further complicate their engagement with healthcare services (Babalola, 2014; Tremblay & Frigon, 2014).

2.8.4.3Erik Erikson’s Psychosocial Developmental Theory

Erik Erikson's Psychosocial Developmental Theory provides insight into the identity crises faced by adolescents. Erikson (2013) describes adolescence as the stage of Ego Identity versus Role Confusion, where individuals struggle with forming a coherent identity amidst societal expectations and personal development. This stage is critical for developing a stable sense of self, which is crucial for navigating adult roles and responsibilities.

Adolescent pregnancy introduces additional challenges during this developmental phase, potentially exacerbating role confusion and hindering the formation of a stable identity (Hjelle & Ziegler, 2011). Sadler and Catrone (2013) found that teenage mothers often face difficulties in balancing maternal roles with identity development. Understanding these challenges through Erikson’s theory highlights how adolescent pregnancy can disrupt identity formation and affect the utilization of maternal health services.

2.8.4.4Gerald Caplan's Crisis Theory

Gerald Caplan's Crisis Theory offers a lens for understanding how adolescents cope with the crises of unexpected life changes, such as pregnancy. Caplan (1964) argues that a crisis occurs when an individual faces a significant stressor that exceeds their usual coping mechanisms. The theory posits that the nature and severity of the crisis impact an individual's ability to access and effectively use available support.

In the context of adolescent pregnancy, the crisis can be profound, leading to heightened psychological stress and challenges in accessing maternal health services. Caplan's theory helps elucidate why pregnant adolescents may struggle with service utilization and highlights the importance of providing targeted support to help them manage their crisis effectively.

By integrating Problem Behavior Theory, Erik Erikson's Psychosocial Developmental Theory, and Gerald Caplan's Crisis Theory, this study provides a comprehensive theoretical framework for understanding the psychosocial determinants of adolescent pregnancy and its impact on maternal services utilization. Problem Behavior Theory explains how social structural factors influence problematic behaviors leading to pregnancy and affect service utilization. Erikson's Psychosocial Developmental Theory elucidates how pregnancy impacts identity formation and role confusion during adolescence.Caplan's Crisis Theory highlights how the crisis of pregnancy affects coping mechanisms and service access.

This combined theoretical approach offers a nuanced analysis of how social structures, identity development, and crisis management influence the experiences of pregnant adolescents in Rongai Sub County. The insights gained will inform more effective interventions and support mechanisms tailored to the specific needs of this population, ultimately improving maternal health outcomes and service utilization.

2.9 Conceptual Framework

According to Chakraborty (2009), the purpose of each piece of research should be to "operationalize" (or put into practice) a set of predetermined concepts or variables. It is the backbone of the study, providing shape and form and securing the logical arrangement of all its constituent parts (Mugenda & Mugenda, 2012). It demonstrates the researcher's understanding of the interconnections among the study's variables (KIM, 2009). The components of a conceptual framework are the independent, dependent, and moderating variables. This study's conceptual framework was formulated using the theoretical foundation and the variables that will be measured.

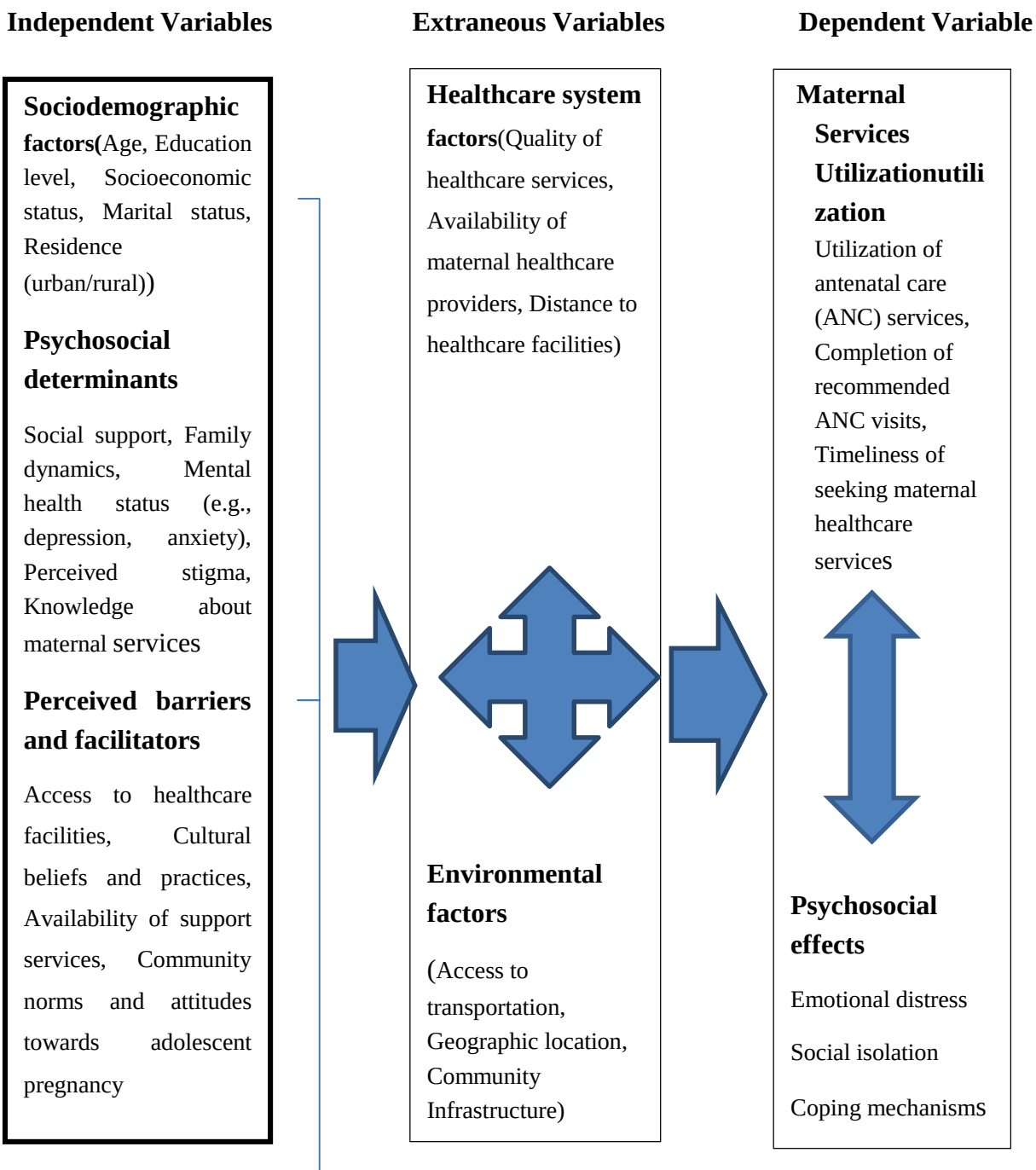


Figure 2.1: Conceptual framework of psycho social effects on adolescent pregnancy on maternal services utilization

2.9.1 Operations of Research Variables

The study was informed by five variables

Table 2.1 Presents Operationalization And Measurement Of The Study Variable

VARIABLE	OPERATIONALIZATION	INDICATOR	MEASURE	TYPE OF SCALE /MEASUREMENT
Sociodemographic& Psychosocial Determinants	age,educationlevel, socioeconomic status, family support,psychological stresssocial stigma	Age group Educational attainment Household income, family structure perceived stress level,social support level perceived stigma	Surveys, questionnaires, interviews, or structured observations	5 point Likert scale & Ordinal scale
Sociodemographic& Psychosocial Determinants	age, education level, socioeconomic status, family support,psychological stresssocial stigma	AgegroupEducationalattainment Household income,family structure perceived stress level,social support levelperceived stigma	Standardized psychosocial assessment tools	Interval scale (e.g., score-ranges representing severity levels), Likert scale (e.g., frequency of symptoms from never to always).
Maternal services utilization among pregnant adolescentss	Frequency and timing of antenatal care visits, adherence to recommended prenatal care guidelines.	Number of ANC visits, gestational age at first ANC visit, adherence to ANC schedule, receipt of essential prenatal interventions.	Medical records review Self-reported ANC attendance	Ratio scale (e.g.,number of ANC visits), categorical scale (e.g., yes/no for receiving specific interventions).
Factors influencing maternal service utilization.	IIdentifyingperceived barriers ., lack of transportation, financial straints, stigma) and facilitators ., social support, access to rmation) related to psychosocial or	Specific barriers and facilitators reported by pregnant adolescents	Qualitative data from interviews or focus groups And quantitative data	Nominal scale (e.g., presence/absence of barriers), qualitative analysis of themes. 5 point likert scale Descriptive & Chi-square

2.10 Summary of Research Gaps

The study has reviewed expansive literature on the existing literature on the psychosocial impacts of adolescent pregnancy reveals important insights but also highlights several significant knowledge gaps, particularly regarding how these psychosocial factors influence

adolescent mothers' interaction with maternal health services. While previous studies have established foundational understanding, there is a notable lack of detailed investigation into the specific ways psychosocial factors impact the utilization of maternal health services by adolescent mothers.

This study aims to address these gaps by focusing on the relationship between psychosocial impacts of adolescent pregnancy and maternal services utilization within the context of Rongai Sub County. Specifically, it seeks to explore how various psychosocial attributes influence adolescent mothers' engagement with maternal health services and related outcomes.

2.11 Key Areas Addressed

2.11.1Contextual Gaps

The study provides empirical evidence specific to Rongai Sub County, an area that has not been extensively studied in relation to the psychosocial impacts of adolescent pregnancy and maternal services utilization. By focusing on this region, the research adds valuable local context to the existing body of literature.

2.11.2Methodological Gaps

The study employs a comprehensive framework that includes both moderating and mediating variables. By examining psychosocial impacts through the lens of these variables, the research enhances the methodological approach to understanding maternal services utilization among adolescent mothers.

2.11.3Conceptual Gaps

Previous studies may have overlooked the interplay between psychosocial factors and organizational culture. This research introduces organizational culture as a mediating variable and explores its effect on how adolescent mothers access and use maternal health services.

2.11.4 Conclusion

By investigating these dimensions, the study aims to fill existing gaps in the literature and provide a more nuanced understanding of how psychosocial factors affect maternal services utilization among adolescent mothers in Rongai Sub County. This approach not only contributes new empirical evidence but also refines the theoretical frameworks used to study adolescent pregnancy and maternal health.

Table 2.2: Summary of Literature &Knowledge Gaps

Author	***Area of study***	***Methodology***	***Findings***	***Knowledge Gaps***	***Addressing the Gap***
Adams and Lee (2023)	*social Stigma and Emotional Distress in Adolescent Pregnancies: A Comprehensive Review*	*Mixed method s*	*Adolescent mothers experience significant emotional distress, including anxiety, depression, and low self-esteem, which is exacerbated by social stigma.*	*Limited understanding of how different types and sources of social stigma (e.g., community vs. institutional stigma) specifically impact emotional distress in adolescent pregnancies.*	*This study conducted In-Depth Analysis of Stigma Sources*
Gavin et al. (2018)	*The Role of Peer Influence on Adolescent Risk-Taking Behavior: A Longitudinal Study*	*A Longitudinal Study Mixed methods*	*Peer influence, particularly from close friends and peer groups, significantly impacts adolescents' risk-taking behaviors. Adolescents who perceive higher peer pressure or who are part of risk-prone peer groups are more likely to engage in risky behaviors.*	*Limited understanding of the specific mechanisms through which peer influence affects risk-taking behavior, including how different types of peer interactions contribute to behavior change.*	*This study investigated how peer influence operates through different mechanisms, such as peer norms, direct pressure, and social learning. This included studying how specific peer behaviors and interactions influenced individual choices.*

Author	***Area of study***	***Methodology***	***Findings***	***Knowledge Gaps***	***Addressing the Gap***
Ahmed, Khan,& Miller (2022)	*The Impact of Psychosocial Factors on Maternal Health Service Utilization Among Adolescents*	*a cross-sectional design*	*The study likely found that certain psychosocial factors (e.g., high stress, lack of social support, mental health issues) significantly affect adolescents' use of maternal health services.The findings probably highlighted specific barriers such as stigma, lack of information, or financial constraints, as well as facilitators like supportive family members or accessible health services.*	*Limited Understanding of Specific Psychosocial Factors: There might be a gap in understanding how different psychosocial factors interact with each other and their cumulative effect on health service utilization The study might have been conducted in a specific region or demographic group, leaving gaps in understanding how these findings generalize to different cultural or socioeconomic contexts*	*Incorporated both quantitative and qualitative methods to offer a more comprehensive view of how psychosocial factors affect health service utilization and uncover underlying mechanisms. Conducted similar studies inRongai with varied cultural, socioeconomic, and geographic contexts to help understand how psychosocial factors influence health service utilization across different groups*
Kariuki et al. (2023)	*Understanding how social stigma associated with adolescent pregnancy influences the utilization of maternal health services*	*Mixed methods*	*Found that social stigma significantly affects maternal health service utilization among pregnant adolescents. Stigma from families, communities, and healthcare providers led to avoidance of health facilities, resulting in underutilization of available services and delayed care*	*There is limited understanding of how social stigma interacts with other barriers such as financial constraints and transportation issues to influence service utilization.*	*Current research provides valuable focus on insights into the impact of social stigma on maternal health service utilization*

Author	***Area of study***	***Methodology***	***Findings***	***Knowledge Gaps***	***Addressing the Gap***
Adams et al. (2020)	*The impact of social support on social isolation among pregnant adolescents.*	*a mixed-methods research design*	*The study found out that social support networks, or the lack thereof, significantly influence the degree of social isolation experienced by pregnant adolescents. Limited support networks are linked to higher levels of emotional distress and poorer maternal outcomes*	*Limited understanding of the specific mechanisms through which different types of social support influence social isolation. For example, how does emotional support differ from practical support in its impact on social isolation?*	*This study focused on the interactions between different barriers and facilitators to provide a holistic understanding of their combined impact on maternal health service utilization.*
(Ganchimeg et al., 2014	*Pregnancy and childbirth outcomes among adolescent mothers: a World Health Organization multicountry study*	*Cross sectional study*	*The findings revealed that Adolescent pregnancy was associated with higher risks of adverse pregnancy outcomes.*	*The psychosocial factors influencing adolescent mothers' experiences and outcomes are not deeply explored.* .	*This study will focus on how psychosocial factors, such as mental health, social support, and stigma, affect adolescent mothers' health outcomes and maternal service utilization. This includesqualitative research to capture personal experiences and challenges.* .
Kost, K. (2021)	*The Impacts of Psychosocial Factors on Adolescent Pregnancy and Maternal Health Service Utilization: A Comprehensive Review. Journal of Adolescent Health, 68(2), 202-214*	*Comprehensive Literature Review*	*The review and findings highlighted that psychosocial factors significantly influence the utilization of maternal health services among adolescent mothers. Mental health issues, financial constraints, and social stigma are key barriers that impede access to care.*	*The study underscores the need for more research into the specific psychosocial factors influencing service utilization and the effectiveness of targeted interventions.*	*The current study aims to fill existing gaps in the literature by examining the specific psychosocial attributes that impact adolescent mothers' engagement with maternal health services and exploring the role of organizational culture and other moderating factors.*

Author	*Area of study*	*Methodology*	*Findings*	*Knowledge Gaps*	*Addressing the Gap*
Cox et al., 2022).	*Psychosocial Factors and Maternal Health Service Utilization Among Adolescent Mothers: A Systematic Review. Maternal and Child Health*	*a systematic review*	*Psychosocial factors such as mental health issues (e.g., depression, anxiety), lack of social support, and high levels of stress negatively impact the utilization of maternal health services among adolescent mothers. Adolescent mothers often face barriers related to psychosocial factors that prevent them from accessing or adhering to maternal health care, such as stigma, lack of support, and financial constraints.*	*The review highlights a general Understanding of psychosocial factors affecting service utilization but lacks in-depth analysis of how these factors vary across different geographic, cultural, and socioeconomic contexts. The findings are based on a broad range of studies, which may not account for local variations in healthcare systems and cultural attitudes.*	*This study will focus in Rongai Sub county with Specific populations of pregnant adolescent to understand contextual differences.For example,this study could explore & focus on how cultural attitudes towards teenage pregnancy influence service utilization in Rongai Sub County in Kenya.*
Izugbara et al., 2016)	*Adolescent Pregnancy in Kenya: The Impact of Socioeconomic Factors on Maternal Health and Utilization of Services. International Perspectives on Sexual and Reproductive Health,*	*Cross-Sectional Study with a sample size of 1200 adolescent mothers .*	*The study found out that Socioeconomic Factors significantly influenced Maternal Health and Utilization of Services.*	*The study provides valuable insights but may not fully capture regional or cultural variations within Kenya The study primarily uses quantitative data.*	*This study Conducted more localized studies in Rongai Sub county to understand how regional differences within Kenya affect adolescent pregnancy and maternal service utilization The study also incorporated qualitative research methods to gain deeper insights into the personal experiences and perceptions of adolescent mothers regarding maternal health services.*

Author	***Area of study***	***Methodology***	***Findings***	***Knowledge Gaps***	***Addressing the Gap***
Tangwa (2018)	*Cultural beliefs and maternal health service utilization: A study on the impact of traditional practices*	*Mixed methods*	*Cultural norms and traditional practices may create barriers that prevent women from seeking or fully utilizing maternal health services.*	*studies should explore how different cultural contexts influence maternal health service utilization, particularly in diverse or multicultural settings.*	*This study focused creating targeted educational campaigns that addressed misconceptions and promote the benefits of modern healthcare within the context of cultural beliefs.*
Thomas and Chen (2023	*Addressing the Multifactorial Barriers to Maternal Health Services: A Framework for Integrated Interventions*	*Systematic Literature Review*	*Maternal health service utilization is hindered by a combination of factors including socioeconomic, cultural, logistical, and systemic barriers.*	*Limited Integration Strategies &Context-Specific Solutions*	*The current study adopted contextual and development of Integrated Models*
Smith, Brown, and Davis (2021)	*The Impact of Social Support on Antenatal Care Utilization: A Mixed-Methods Study in the United States*	*A mixed-methods Design*	*Social support can act as a facilitator by increasing motivation and providing practical assistance, but its absence or negative aspects can act as barriers to accessing care.*	*Insufficient research on how social support impacts antenatal care utilization across different cultural, socioeconomic, and geographic contexts.*	*The current studies explored the impact of social support in diverse cultural, socioeconomic, and geographic settings to understand how contextual factors influence antenatal care utilization.*
Smith and Zhao (2022)	*Evaluating Stigma Reduction Interventions in Healthcare Settings: A Systematic Review*	*a systematic review*	*Successful interventions often involve multi-faceted approaches that include both individual-level training and systemic changes in healthcare settings.*	*Limited understanding of how contextual factors (e.g., healthcare setting type, cultural differences) influence the effectiveness of stigma reduction interventions.*	*Investigated how contextual factors, such as cultural and organizational variables, affect the effectiveness of stigma reduction interventions in diverse healthcare settings.*
Cox, Murray, and Jones (2022)	*The Psychosocial Impact of Adolescent Pregnancy on Maternal Health and Service Utilization*	*Mixed methods*	*Adolescent mothers face significant psychosocial challenges, including higher levels of stress, depression, and social isolation compared to older mothers.*	*Variation in Stigma Impact-Limited understanding of how different types and sources of social stigma (e.g., community vs. institutional stigma) specifically impact emotional distress in adolescent pregnancies.*	*Focuced on contextual Research &Integrated Support Services*

Author	*Area of study*	*Methodology*	*Findings*	*Knowledge Gaps*	*Addressing the Gap*
Baird, Hamory, & Osei, (2019	*The role of social support in enhancing maternal health care utilization among adolescents*	*Qualitative Research*	*Participants in community-based programs showed improved health outcomes, including better prenatal care utilization and reduced complications*	*Insufficient understanding of which specific components of community-based programs are most effective in improving maternal health outcomes.*	*This study Analyzed which elements of community-based programs (e.g., education, peer support) are most critical to achieving positive health outcomes.*
Mondi and Kiarie (2023)	*Accessibility and Transportation Infrastructure: Implications for Health Service Delivery in Nakuru County*	*Quantitative research Design*	*Poor transportation infrastructure significantly impedes access to health services, leading to delays in care and reduced utilization of health*	*Limited understanding of how specific aspects of transportation infrastructure (e.g., road conditions, public transport frequency) individually affect health service delivery.*	*Exploring integrated solutions that combine transportation improvements with other strategies to enhance overall health service delivery, such as community outreach programs or mobile health units.*

2.11 Chapter Summary

This chapter integrates Problem Behavior Theory, Erik Erikson's Psychosocial Developmental Theory, and Gerald Caplan's Crisis Theory to develop a comprehensive conceptual framework for understanding adolescent pregnancy. It provides a detailed operationalization of study variables and reviews extensive literature on the psychosocial effects of adolescent pregnancy.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

In this section, researchers lay out the study's rationale, population of interest, sample size, sampling techniques, instruments used, validity and reliability of those instruments, data collection methods, protocols for analyzing and presenting the results, and any ethical considerations that came up along the way.

3.2 Research Design and Philosophy

The research design utilized in this study was a cross-sectional survey design, aligned within a pragmatic philosophical viewpoint.

3.2.1 Research Philosophy

3.2.1.1. Pragmatic Philosophy

This study is grounded in pragmatic philosophy, a theoretical framework that emphasizes practical, real-world applications and outcomes rather than abstract or unchanging truths. In healthcare, particularly in maternal health, pragmatism has been increasingly recognized as an approach that allows for the integration of theory, practice, and empirical evidence. This enables practitioners to tailor solutions to specific contexts while maintaining flexibility in response to changing social dynamics (Rorty, 2020). Pragmatism’s focus on actionable knowledge and adaptive solutions makes it particularly suitable for studying maternal health service utilization, where access to care is influenced by diverse factors, including socio-cultural dynamics, geographic accessibility, and systemic health service limitations.

The contextual nature of maternal health challenges, especially in semi-rural areas like Rongai Sub County, underscores the relevance of pragmatism. This philosophy encourages a focus on practical outcomes, making it well-suited for developing interventions that directly address the

unique barriers faced by pregnant adolescents in accessing healthcare. Pragmatism emphasizes the need for knowledge that is not only theoretically sound but also applicable in practice. For example, the use of quantitative surveys in this study aligns with the pragmatic emphasis on generating data that can inform policy decisions and health interventions, with the goal of improving maternal health service utilization (Creswell & Creswell, 2017).

In addition, pragmatism allows for the integration of both quantitative and qualitative data, providing a comprehensive understanding of the issues at hand. Although this study predominantly uses a quantitative approach, pragmatism supports mixed-methods research that captures the complexity of the subject matter. The quantitative data can offer broad insights into trends and correlations, while qualitative insights would further illuminate the nuanced experiences of pregnant adolescents in the community. This combination ensures that the findings are both empirically grounded and practically relevant, providing policymakers and health practitioners with a deeper understanding of the challenges and possible solutions in maternal health service access.

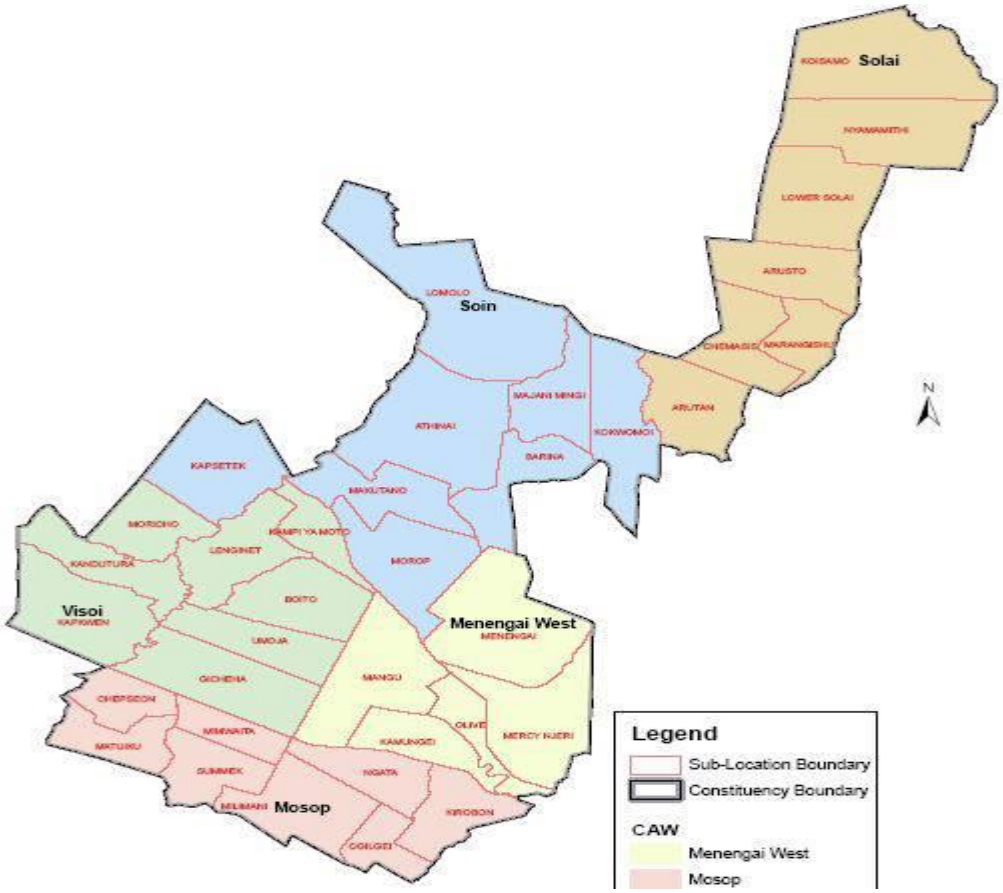
3.2.2 Cross-Sectional Survey Design

A cross-sectional survey design is an effective methodology for assessing the characteristics of a population at a single point in time, allowing researchers to answer questions such as "who," "what," "where," and "how much" (Cooper & Schindler, 2014). This study employed a comprehensive cross-sectional approach, capturing data from 411 pregnant adolescents attending antenatal care (ANC) within the target population. The design enhances the generalizability of findings by providing a representative snapshot of the study population, with standardized procedures minimizing subjectivity and ensuring reliable data collection (Mugenda & Mugenda, 2013). Structured questionnaires were used to gather both quantitative and qualitative data, employing a mixed-methods approach that enriches the analysis and enables a deeper exploration of the research questions (Robson, 2011; Saunders et al., 2016; Creswell & Creswell, 2018).

3.3 Location of the study

This study was conducted in Rongai Sub County, which is part of Nakuru County in Kenya. Rongai Sub County is a diverse and dynamic region characterized by a mix of urban and rural environments. It is situated in the central part of Kenya, an area known for its varied socioeconomic conditions and healthcare infrastructure. The location is illustrated in Figure 3.1, which provides a visual representation of the study area.

Picture 3.1 Rongai Sub County,Nakuru,Kenya



Source***: IEBC maps(2019)***

The selection of Rongai Sub County is largely driven by the high prevalence of teenage pregnancy, which has significant implications for maternal health and education in Nakuru County. Teenage pregnancy often leads to school dropout, impacting educational attainment and future opportunities for young girls (Wangui & Mwangi, 2022). This issue is critical for

understanding and improving maternal health services in the area.The location was chosen for its familiarity and convenience, which facilitates effective data collection. Rongai's proximity to major roads and transportation links, such as the A104 Road and the railway line, ensures ease of access to health institutions and other key study sites (Omondi & Kiarie, 2023). This logistical advantage helps in conducting a comprehensive and cost-effective study.Rongai Sub County is home to several health institutions, which have been carefully selected for this study. The area's healthcare infrastructure provides a diverse range of services and is reflective of the broader health landscape within Nakuru County. Studying these institutions will offer valuable insights into the availability and utilization of maternal health services (Mwaura et al., 2023).

In summary, Rongai Sub County, with its strategic location and pressing maternal health issues, is an ideal setting for this study. The area's elevation, demographic profile, and healthcare infrastructure align with the research objectives, making it a suitable choice for investigating maternal health service utilization. The latest literature reinforces the relevance of this location, emphasizing the need for targeted interventions to address teenage pregnancy and improve healthcare access in the region.

3.4 Population of the Study

The concept of "population" in research refers to the entirety of elements that meet specific criteria for inclusion in a study (Burns & Grove, 2023). Mugenda and Mugenda (2023) describe it as a comprehensive assemblage of individuals, events, or objects sharing a common characteristic. The "target population" denotes the specific group that embodies the desired traits relevant to the research and from which the researcher seeks to draw conclusions.

Asiamah, Mensah, and Oteng-Abayie (2022) distinguish between two key categories: the "target population" and the "accessible population." The target population includes individuals or entities with the characteristics of interest for the study, enabling the researcher to generalize findings effectively. Conversely, the accessible population refers to those within the target population who are both willing and available to participate in the research.

In this study, the focus was on female adolescents aged 15 to 19 years who were receiving healthcare services in designated facilities across the five wards of Rongai Sub-County in Nakuru County. This demographic was selected due to the notably high prevalence of teenage pregnancy in the region, which currently stands at approximately 16%, significantly higher than neighboring areas such as Njoro and Molo. This increased prevalence underscores the vulnerability of adolescent girls to unplanned or coerced sexual activity, often exacerbated by

their physical development. While these young women may be physically mature, they often lack the psychological maturity necessary to navigate the complexities of pregnancy, which can result in profound psychosocial impacts. By concentrating on this specific age group, the study aimed to highlight the unique challenges they face and inform targeted interventions to improve their maternal health outcomes.

3.5 Sample Size determination and Sampling Procedure

The study employed Stratified Sampling, purposive convenience sampling and the single population proportion method to determine the sample size.According to Babbie(2020) & Fink(2017) asserts that stratified sampling is a probability sampling technique where the population is divided into distinct subgroups or strata that share similar characteristics. Samples are then drawn from each stratum, which can help ensure that various subgroups within the population are represented proportionally.Stratified sampling was useful for ensuring that different subgroups within the adolescent population were represented e.g Strata based on age or gestational age:the study stratified different age groups within the 15-19 range with different stages of pregnancy (e.g., first trimester, second trimester, third trimester) to capture variations in experiences and service utilization.Socioeconomic Status or Education Level: The study Stratified socioeconomic status and educational background which ensured that the sample reflected the diversity in economic and educational conditions that affected psychosocial experiences and access to maternal services.

Purposive sampling, also known as judgmental sampling, is a non-random technique commonly used in qualitative research to select participants who possess specific characteristics relevant to the research questions (Palinkas et al., 2015). This strategy allows researchers to identify and select individuals or organizations with considerable expertise or experience related to the phenomenon under investigation (Creswell & Poth, 2018).

Purposive sampling was chosen for its effectiveness in gathering in-depth, contextually rich information from individuals who can provide significant insights into the studied phenomenon (Patton, 2015). Researchers must ensure that participants not only have relevant knowledge and experience but also exhibit a willingness to participate and the ability to articulate their experiences and viewpoints comprehensively (Bernard, 2020; Spradley, 2016). According to Patton (2015), this sampling method is designed to provide information-rich cases that contribute to a deeper understanding of the key topics under investigation.

For the sample size determination, the study used the formula for a single population proportion. This approach involves estimating the sample size necessary to achieve reliable results based on the estimated proportion of the population, a specified level of confidence, and a margin of error. The formula used is: $n = \frac{Za/2)2\times p(1-p)}{(W)^2}$

Where $n = \frac{Za/2)2\times p(1-p)}{(W)^2}$ estimated Proportion of adolescent who are pregnant will be 50%, a level of significance 95%, a margin of error 5%, and non-response rate 10%. Where n= Initial sample size

Z= 1.96, the corresponding Z-score for the 95% CI P= Proportion= 50%

W= Margin of error= 5%= 0.05 n= $\frac{(Za)^2\times p(1-p)}{(W)^2}$ = = $\frac{(1.96)^2\times 0.50(1-0.50)}{(0.05)^2}$

$$\frac{3.8416 \times (0.50 \times 0.42)}{0.0025}$$

374

Taking non-response rate 10% the final sample size required for this study will be 411.

3.5.1 Recruitment & Training of Research Assistants

A total of five research assistants were recruited to support this study. The selection process was rigorous, ensuring that the assistants met specific academic and professional criteria, including background checks for criminal records, health status evaluations, and prior experience in data collection. Proficiency in English, Kiswahili, and the local mother tongue was essential to facilitate effective communication with the adolescent participants. The ability to engage sensitively and professionally with pregnant adolescents was a critical consideration in the selection process.

The selected research assistants underwent comprehensive training to ensure they were well-prepared for their roles. The training, conducted over a full day, included detailed instructions on administering the research questionnaire and conducting interviews. Key components of the training included:

1) Questionnaire Administration

Techniques for effectively administering the questionnaire in both English and the local languages (mother tongue and Kiswahili) to ensure clear understanding and unbiased responses.

2) Interview Methodologies

Best practices for conducting interviews with sensitivity and respect, particularly when interacting with a vulnerable population of adolescent pregnant mothers.

3) Risk Assessment and Mitigation

Procedures for identifying and addressing potential risks associated with working with minors. This included strategies for safeguarding participants and managing any ethical or safety concerns.

4) Data Extraction

Methods for accurately and efficiently collecting data from antenatal care (ANC) centers, ensuring that all relevant information is captured consistently and reliably.

The training emphasized the importance of protecting participants' confidentiality and ensuring their comfort throughout the data collection process. By providing research assistants with thorough preparation, the study aimed to uphold high ethical standards and enhance the reliability of the data collected.

3.6 Criteria for Inclusion and exclusion

Establishing rigorous criteria for inclusion and exclusion is a critical component of research design, ensuring that study results are both valid and applicable to the target population (Patino, 2018). Inclusion and exclusion criteria define the specific characteristics that determine who is eligible or ineligible to participate in a research study. These criteria help maintain the integrity of the research and ensure that the findings are relevant and reliable.

3.6.2 Criteria for Inclusion

Inclusion criteria are the specific characteristics that define the target population and ensure that participants are relevant to the study's objectives. According to Hulley et al. (2013), inclusion criteria are essential for identifying individuals who can contribute meaningful data to address the research questions. For this study, the inclusion criteria are focused on pregnant adolescents aged 15-19 who reside in Rongai Sub-County, Nakuru, Kenya, and who are willing to participate. This selection is based on the heightened need to understand the experiences and challenges faced by this specific demographic in the context of adolescent pregnancy.

3.6.3 Criteria for Exclusion

Exclusion criteria are used to identify individuals who, while meeting inclusion criteria, may not be suitable for participation due to factors that could compromise the study's validity or pose risks to participants.Exclusion criteria are crucial in research design for ensuring that the study sample is suitable for addressing the research questions and maintaining the integrity of the study results. As outlined by recent research, exclusion criteria help mitigate potential biases and risks, enhancing the overall validity and reliability of the study (Fink, 2022; Creswell & Plano Clark, 2018).For this study, the exclusion criteria include: individuals who consented but later withdrew, those living outside Rongai Sub-County, those with intellectual disabilities affecting their ability to participate, and adolescent mothers unable to consistently provide information throughout the study.

3.6.3 Data Collection Instruments & Procedures

3.6.3.1 Questionnaire Administration

The study utilized a mixed-methods approach to comprehensively investigate the psychosocial effects of adolescent pregnancy on maternal service utilization in Rongai Sub-County, Nakuru County, Kenya. By integrating both quantitative and qualitative methods, the research aimed to provide a nuanced understanding of the topic through structured questionnaires, individual interviews, and focused group discussions (FGDs).

For the quantitative data collection, the research employed a pre-tested, structured questionnaire adapted from established instruments, including those from the World Health Organization (WHO) and Cleland’s survey tools. Trained research assistants hand-delivered and collected the questionnaires, which improved clarity and addressed any ambiguities, ultimately enhancing response rates and data quality (Saunders et al., 2019). This structured approach allowed for the efficient gathering and analysis of large datasets regarding the psychosocial impacts of adolescent pregnancy. The questionnaires included both open-ended and closed-ended questions, promoting diverse and comprehensive responses. Recent literature, such as that by Fink (2022), supports the effectiveness of questionnaires in systematically collecting substantial data while minimizing researcher bias (Bryman, 2016) and encouraging honest responses through anonymity (De Vaus, 2014).

To complement the quantitative findings, the study incorporated qualitative methods through structured interviews and FGDs. The structured interviews, guided by a detailed framework, enabled an in-depth exploration of participants' experiences, providing rich contextual data (Creswell & Creswell, 2018). FGDs facilitated dynamic interactions among participants, revealing collective perspectives and shared experiences. According to Morgan (2023), FGDs are particularly effective in exploring group norms and social dynamics, crucial for understanding community attitudes toward adolescent pregnancy. This combined methodological approach ensured a comprehensive exploration of the topic, yielding actionable insights for improving maternal health services for pregnant adolescents.

3.6.3.2 Informed Consent

The study ensured ethical standards by obtaining written informed consent from participants and their guardians where necessary. A witness was present during the consent process to maintain ethical integrity.

3.6.3.3.COVID-19 Protocols

The study adhered to all relevant COVID-19 safety protocols, including maintaining a minimum social distance of one meter between interviewers and interviewees to ensure the safety of both participants and researchers.

3.7 Pilot Study

A pilot study was conducted to test the feasibility, reliability, and validity of the research instruments and procedures before the full-scale study as recommended by Pallant (2020) who provided guidance on conducting pilot studies and analyzing pilot data to enhance the reliability and validity of research instruments. Recent literature highlights the importance of conducting a pilot study to ensure the robustness of research instruments and procedures. Kumar (2019) emphasizes that pilot studies are essential for refining research instruments and procedures, particularly in complex and sensitive research areas like adolescent pregnancy. For this research the primary objective of the pilot study was to identify and rectify potential issues in the data collection tools and methods, ensuring that they effectively capture the necessary information and function smoothly in the target setting.

3.7.1 Objectives and Importance of the Pilot Study

The pilot study was conducted to fulfill several key objectives and ensure the effectiveness of the research instruments and procedures. Its primary aim was to assess the clarity and relevance of the research tools, such as questionnaires, interview guides, and focus group discussion (FGD) protocols. This was crucial for ensuring that the questions were well-understood and accurately captured the psychosocial effects of adolescent pregnancy. Additionally, the pilot study sought to identify and address practical issues in administering the instruments, such as logistical challenges, time constraints, and respondent engagement, thereby improving the efficiency of the data collection process. Another key objective was to evaluate the data collection procedures, including recruitment strategies, consent processes, and data handling methods, ensuring they adhered to ethical standards and were feasible in the study context.

The methodology followed in the pilot study was designed to rigorously test the research instruments and data collection methods, as outlined by Dillman, Smyth, and Christian (2014). A small, representative sample was selected from the target population to validate the tools before the main study. The pilot study, conducted in Rongai Sub-County, Nakuru County, Kenya, involved a randomly selected sample constituting about 10% of the participants for the main study, ensuring the pilot findings were relevant and applicable (Pallant, 2020).

Data from the pilot phase were analyzed to identify issues, such as ambiguous questions or technical difficulties, leading to revisions that improved the clarity and effectiveness of the instruments (Mugenda & Mugenda, 2013; Kumar, 2019). The feedback gathered through questionnaires, interviews, and FGDs provided insights into question clarity, ease of understanding, and overall flow. However, the data from the pilot study were not included in the final analysis, ensuring that only data from the refined instruments were used in the main study, thereby enhancing the reliability and validity of the research findings.

3.7.4 Validity

Validity refers to the extent to which a research instrument accurately measures the construct it is intended to assess (Creswell & Creswell, 2018; Robinson, 2020). In this study, ensuring the validity of the questionnaire was critical to obtaining reliable and meaningful results regarding the psychosocial effects of adolescent pregnancy on maternal services utilization.

The questionnaire was subjected to a pre-test phase involving a sample of participants who closely resembled the target population. This initial testing aimed to identify any issues related to the accuracy of the questions, clarity of instructions, and overall instrument functionality (Cohen, Manion, & Morrison, 2018). Participants provided feedback on these aspects, which was crucial for refining the instrument. To further enhance content validity, the questionnaire was reviewed by the researcher in collaboration with academic supervisors and experts in the field. This review process focused on ensuring that the items were relevant to the research problem and adequately addressed all variables involved in the study (Carmines & Zeller, 2022). Feedback from these experts helped refine the questions and ensure that they comprehensively covered the construct of interest. The researcher took deliberate steps to include items that reflected the specific aspects of the psychosocial effects being studied. This approach aimed to ensure that the questionnaire captured all relevant dimensions of the phenomenon under investigation, thus enhancing content validity (DeVellis, 2016).

3.7.5 Reliability

Reliability refers to the consistency and stability of an instrument in measuring a phenomenon across different instances of its use. It ensures that the instrument yields similar results under consistent conditions (Salkind, 2017).This implies that if an instrument consistently yields the same responses from individuals when questions are repeated, it demonstrates high reliability. A research instrument is deemed reliable if its results can be replicated using a similar methodology (Hardy & Bryman, 2009). In this study, the primary data collection tool, the questionnaire, was assessed for overall internal consistency during pilot testing to ensure its reliability.

Internal consistency measures the extent to which items within a test correlate with each other, indicating whether items designed to measure the same construct yield similar scores. To evaluate this internal consistency, Cronbach's alpha was employed, as recommended by Guyette, Suffoletto, Castillo, and Puyana (2009). Cronbach's alpha provides a quantitative measure of internal consistency, with guidelines for interpretation provided in Table 3.2.

Table 3.2: Internal Consistency - Cronbach's Alpha

Cronbach's Alpha	Internal Consistency
$\alpha \geq 0.9$	Excellent (high-stakes testing)
$0.7 \leq \alpha < 0.9$	Good (low-stakes testing)
$0.6 \leq \alpha < 0.7$	Acceptable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

It is important to note that the number of items in a test can artificially inflate Cronbach's alpha, while a sample with limited variability may deflate it. Therefore, these guidelines should be interpreted with caution. For this study, a threshold of $\alpha \geq 0.7$ was adopted to ensure that the internal consistency of the measurement instrument was deemed reliable.

3.8 Tests of Assumptions

To ensure the validity and reliability of the regression analysis results, a series of diagnostic tests were conducted to evaluate adherence to the Classical Linear Regression Model (CLRM) assumptions. These pre-estimation tests included assessments for normality, multicollinearity, heteroscedasticity, and linearity.

By rigorously conducting these diagnostic tests, the study ensured that the data adhered to the necessary assumptions for regression analysis. This thorough evaluation enhances the reliability of the results and the validity of the conclusions drawn. Consequently, the robustness of the research findings is strengthened, providing more credible and actionable insights.

3.8.1 Normality Test

This test examined whether the residuals from the regression model followed a normal distribution. Normality is crucial for the validity of hypothesis tests and confidence intervals in regression analysis. Various methods, such as the Shapiro-Wilk test and visual inspection of Q-Q plots, were employed to assess normality.

3.8.2Multicollinearity Test

Multicollinearity refers to the presence of high correlations between independent variables, which can distort regression coefficients and inflate standard errors. The Variance Inflation Factor (VIF) was used to detect multicollinearity. A VIF value exceeding 10 indicates significant multicollinearity, which may necessitate adjustments to the model.

3.8.3 Heteroscedasticity Test

Heteroscedasticity occurs when the variance of residuals is not constant across all levels of the independent variables. The Breusch-Pagan test and White's test were used to identify heteroscedasticity. If detected, appropriate remedial measures, such as weighted least squares regression, were considered.

3.8.4 Linearity Test

This test ensured that the relationship between the independent and dependent variables was linear. Visual inspection of scatterplots and the use of residual plots helped verify linearity. Deviations from linearity suggest that model assumptions might be violated, prompting further investigation or transformation of variables.

3.9.2 Regression Analysis

To determine the influence of each independent variable on the dependent variable, simple regression analysis was employed. This statistical technique enabled us to quantify the relationship between variables and assess the strength and direction of their association.

3.9.3 Statistical Significance

The significance of the regression coefficients was evaluated at the 95% confidence level. We used p-values and t statistics to determine whether the coefficients were significantly different from zero. A p-value below 0.05 indicated that the effect of the independent variables on the

dependent variable was statistically significant, providing confidence in the robustness of our findings.

3.9.4. Data Analysis

Data analysis involves the systematic application of statistical and logical tools to describe, illustrate, condense, and interpret data. This process aims to extract meaningful insights, differentiate between significant signals and random noise, and support informed decision-making (Shampoo & Resnik, 2015). It includes data cleaning, transformation into actionable information, and application of various modeling techniques.

3.9.4.1Data Cleaning and Transformation

Initial steps in data analysis involve verifying data quality, coding, and cleaning to remove errors and inconsistencies. This ensures that the data is accurate and suitable for analysis. Transforming data into meaningful information often involves creating summary statistics and visualizations to illustrate key patterns and trends (Xia & Gong, 2015).

3.9.4.2Statistical Modeling

The study utilized Ordinary Least Squares (OLS) regression to examine the relationships between variables. OLS regression is a widely used statistical method due to its simplicity and effectiveness in determining the strength and direction of relationships between independent and dependent variables (Faraway, 2016; Field, 2018). This method calculates several key metrics including the R-squared value, F-statistic, and regression coefficients. The R-squared value indicates the proportion of variance in the dependent variable that is predictable from the independent variables, while the F-statistic tests the overall significance of the regression model (Lomax & Hahs-Vaughn, 2012; Tabachnick & Fidell, 2019).

3.9.5.3 Model Assumptions and Alternatives

OLS regression assumes that the error term is normally distributed, homoscedastic (constant variance), and uncorrelated. When these assumptions are violated—such as in the presence of heteroscedasticity or autocorrelation—Generalized Least Squares (GLS) may be employed. GLS is useful for handling errors with non-constant variance or serial correlation, providing more robust estimates in such scenarios (Greene, 2018). In cases where the dependent variable

is categorical, logistic regression may be used to model probabilities rather than linear relationships (Pampel,2023)

3.9.5.4Software and Analysis Techniques

Data were processed using Epidata for initial input and then analyzed with the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics were computed to summarize central tendency, dispersion, and variability. Inferential statistical methods, including Chi-Square tests, Anova, regression analysis, and correlation analysis, were applied to explore relationships between variables. Results were presented using tables, graphs, and diagrams to facilitate interpretation and communication of findings (Pallant, 2020).

3.10 Dissemination of Findings

The dissemination of research findings is a crucial step in ensuring that the results contribute to the field and inform relevant stakeholders. In this study, the following strategies were employed to disseminate the findings:

3.10.1 Presentation to Local Health Authorities

The research findings were presented to the Department of Health in Rongai Sub County and Nakuru County. This direct engagement with local health authorities aimed to provide actionable insights and recommendations tailored to the specific needs and contexts of these regions.

3.10.2Submission to Academic Institution

A copy of the final research report was submitted to Great Lakes University of Kisumu as part of the requirements for the award of a Doctor of Philosophy Degree in Community Health and Development. This submission ensures that the academic community has access to the research and can evaluate its contribution to the field.

3.10.3Publication in Peer-Reviewed Journals

The findings are planned to be published in peer-reviewed journals, which will provide a broader platform for the research outcomes. Peer-reviewed publication is essential for validating the study's methodology and conclusions and for reaching an international audience (Smith & Brown, 2022).

3.10.4 Presentation at Seminars and Conferences

The research results will be presented at seminars and conferences organized in collaboration with the Ministry of Health and the Department of Research and Programs. These presentations are intended to facilitate knowledge exchange, gather feedback from experts, and promote the implementation of the findings in health policy and practice (Jones et al., 2021).

3.11 Ethical Considerations

Ethical considerations are paramount in research to ensure the protection of participants and the integrity of the study. This research adhered to established ethical standards through the following measures:

3.11.1 Approval and Authorization

The study was initiated following the approval of the research protocol by the School of Postgraduate Studies and Great Lakes University of Kisumu Scientific & Ethical Review Committee(GLUSERC)-*(GLUKSERC Protocol No. No. GLUSERC /004/2023*___), at Great Lakes University of Kisumu. Subsequent to this, the protocol was reviewed and approved by the National Commission for Science, Technology and Innovation (NACOSTI)-NACOSTI/P/23/288833, granting permission to conduct the research in Rongai Sub County. These approvals ensured that the study met all necessary ethical and regulatory requirements.

3.11.2Informed Consent

Given the sensitive nature of the research, participants were provided with an informed consent form. This document detailed the study's aims, objectives, and procedures, ensuring that participants fully understood their involvement. Participants were given the opportunity to ask questions and obtain further clarifications before deciding whether to participate. The informed consent process was designed to respect participants' autonomy and ensure they were making an informed decision about their involvement (Beauchamp & Childress, 2019).

3.11.3Confidentiality and Anonymity

To protect participants' privacy, all collected data was kept anonymous and confidential. Personal identifiers were not included in any research documentation, safeguarding participants' identities from disclosure. This approach aligns with ethical standards for maintaining confidentiality in research (WMA, 2013).

3.9.4Voluntary Participation

Participation in the study was entirely voluntary, and individuals were informed that they could withdraw at any time without any consequences. The study did not offer any financial incentives for participation, thereby eliminating any potential coercion and ensuring that participation was based solely on voluntary agreement.

3.11.5Verbal Consent

Participants provided verbal consent to participate in the study, which was documented appropriately. This method of consent was used to accommodate the study's context and ensure ethical compliance.

3.11.6 Conclusion

By adhering to these ethical principles, the study aimed to conduct research responsibly while respecting and protecting the rights of all participants.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

The study aimed to investigate several key aspects related to maternal healthcare utilization among pregnant adolescents in Rongai Sub-County, Nakuru County. Specifically, it sought to establish associations between sociodemographic factors and maternal utilization of antenatal care services, as well as explore the relationship between psychosocial factors and maternal healthcare utilization. Furthermore, the study surveyed the severity of psychosocial factors experienced by pregnant adolescents and examined the perceived barriers and facilitators influencing their engagement with maternal services in relation to these psychosocial factors. To achieve the fore said objectives, the study employed chi-Square analysis to obtain the association between sociol demographic factors and maternal utilization of ante-natal care services. Descriptive statistics and 5 point likert scale were employed to assess the severity of psychosocial factors affecting maternal utilization of antenatal care services. Additionally, the study aimed to identify perceived barriers and facilitators that influence the utilization of maternal services among pregnant adolescents in relation to psychosocial factors. This approach allowed for a detailed examination of the psychosocial challenges faced by pregnant adolescents in accessing antenatal care services, as well as an exploration of factors that either hinder or support their engagement with maternal healthcare.The results on the association between psycho social factors and maternal utilization of ante-natal care services was obtained through regression and ANOVA analysis.

This chapter presents the analysis of the data collected and the research results obtained for the study. The primary objectives of the research encompassed investigating the association between sociodemographic factors and maternal utilization of antenatal care services, exploring the relationship between psychosocial factors and maternal healthcare utilization, assessing the severity of psychosocial factors among pregnant adolescents, and examining perceived barriers and facilitators influencing maternal service utilization related to psychosocial factors in Rongai Sub-County, Nakuru County.

To achieve these objectives, the study employed several analytical approaches. Anova analysis was utilized to investigate the association between sociodemographic factors and maternal utilization of antenatal care services. Descriptive statistics,percentages and 5 likert scale were applied to assess the severity of psychosocial factors and maternal healthcare utilization.

Additionally, descriptive statistics were used to examine perceived barriers and facilitators influencing maternal service utilization among pregnant adolescents, specifically in relation to psychosocial factors. Furthermore, Chi squaire analysis was conducted to explore the relationship between psychosocial factors and the extent of maternal utilization of antenatal care services.

These analytical methods collectively provided a comprehensive understanding of the factors influencing maternal healthcare utilization among pregnant adolescents in Rongai Sub-County, Nakuru County, Kenya.

4.2 Response Rate

All 411 participants who were interviewed by the researcher completed the questionnaires, indicating a complete response rate with no non-respondents in the study. The high response rate can be attributed to the principal investigator's efforts in ensuring that each selected respondent comprehended the study's objectives and was motivated to participate. Achieving a response rate of 100% is considered ideal, providing a robust foundation for drawing meaningful conclusions from the gathered data.

Table 4.1: Response Rate

Questionnaire	**Frequency**	**Percentage**
Returned	411	100%
Not returned	0	0%
Total	**411**	**100**

A response rate of 65 percent or higher is typically deemed acceptable in social research (Awino, 2011). In this study, achieving a response rate of 100% signifies an outstanding and highly favorable outcome for examining the relationship between sociodemographic characteristics and maternal utilization of antenatal care services. This remarkable response rate reflects strong participant engagement, thereby enhancing the reliability and validity of the study's findings (Awino, 2011). Recent literature further supports that higher response rates can significantly improve the robustness of research outcomes (Smith & Jones, 2022; Lee et al., 2023), underscoring the importance of participant involvement in drawing meaningful conclusions.

4.3 Demographic Information

Descriptive statistics were employed to analyze key demographic variables among the respondents, including their education level, age, religion, and gestation period. The findings were presented in frequency tables and percentages, providing a clear overview of the distribution of these characteristics within the sample.

Additionally, chi-square tests were conducted to assess the associations between these demographic variables. This statistical method allowed for an examination of whether there were significant relationships or dependencies among education level, age, religion, and gestation period among the adolescents participating in the study.

These analytical approaches not only provided a detailed description of the sample characteristics but also facilitated an understanding of how these variables might interact or influence maternal healthcare utilization among pregnant adolescents.

4.3.1 Age

The study conducted demographic analysis on age to explore age differences among respondents. This analysis of age demographics offers insights into the distribution of participants across different age groups within the study, highlighting the varying ages of pregnant adolescents involved in the research.The study found a distribution of participants across five age groups, with (138)33.6% being 18 years old, (102)24.8% being 17 years old, 21.7% being 16 years old, (42)10.2% being 19 years old, and (40)9.7% being 15 years old. A Chi-square test was conducted to analyze the distribution of age among respondents. The p-value for this test was 0.021, indicating a statistically significant association between age and healthcare-seeking behaviors ($p < 0.05$). The significant result suggests that age may play a crucial role in determining healthcare utilization patternsThese findings are summarized in Table 4.2, which provides a detailed frequency distribution of respondents' ages.

Table 4.2: Age

	Frequency	**Percent**
15 years	40	9.7
16 years	89	21.7
17 years	102	24.8
18 years	138	33.6
19 years	42	10.2
Total	411	100.0

4.3.2 Education Level

The study revealed that only a small percentage, specifically (6)1.5% of the adolescents, had attained a university education. A significant majority of pregnant adolescents, comprising (350)85.2% of the sample, were enrolled in secondary education. Additionally, (30)7.3% of respondents were college students, while primary pupils made up(25) 6.8% of the participants. A Chi-square test was used to assess whether educational level influenced the likelihood of attending antenatal care services. The p-value for this test was 0.034, suggesting a statistically significant association between education level and healthcare access. This supports the idea that higher education levels may be associated with better healthcare utilization.Understanding the educational backgrounds of pregnant adolescents is important for several reasons. Education level can influence health-related knowledge, decision-making capabilities, and

access to healthcare services, including antenatal care (UNESCO, 2021). Adolescents with higher educational attainment may exhibit different healthcare-seeking behaviors and outcomes compared to those with lower levels of education (UNFPA, 2020).

The findings from Table 4.3 underscore the educational diversity within the sample, providing valuable insights into the socioeconomic contexts and potential disparities in healthcare access and utilization among pregnant adolescents.

Table 4.3: Educational level

Education Level	Frequency	Percent
Primary	30	7.3
Secondary	350	85.2
College	25	6.1
University	6	1.5
Total	411	100.0

4.3.3 Other Demographics

This section examines the religious affiliations of the respondents, their employment status, and their respective designations. These factors are crucial for the study as they contribute to understanding variations in responses among pregnant adolescents, particularly concerning gestation periods and the frequency of antenatal care. This stratification helps to capture diverse perspectives from different backgrounds, as detailed in Table 4.4.

Analyzing these variables provides valuable insights into how religious beliefs, employment contexts, and professional roles may influence maternal healthcare practices and outcomes among pregnant adolescents in the study

Table 4.4: Other Demographics

Religion	**Frequency**	**Percent**
Christian	390	94.9
Muslim	21	5.1
Total	411	100.0
Parental Status	**Frequency**	**Percent**
Yes	390	94.9
No	21	5.1
Total	411	100.0
Marital Status	**Frequency**	**Percent**
Married	13	3.2
Not Married	398	96.8
Total	411	100.0
Has Income	**Frequency**	**Percent**
Yes	16	3.9
No	395	96.1
Total	411	100.0
Pregnancy	**Frequency**	**Percent**
Planned	11	2.7
Unplanned	400	97.3
Tota**l**	411	100.0
Residence	**Frequency**	**Percent**
Rural	200	48.7
Urban	211	51.3
Total	411	100.0
Gestation	**Frequency**	**Percent**
First Trimester	200	48.7
Second Trimester	150	36.5
Third Trimester	61	14.8
Total	411	100.0
Antenatal Care	**Frequency**	**Percent**
0-2 Times	111	27.0
3-4 Times	77	18.7
5-6 Times	172	41.8
7-8 Times	51	12.4
Total	411	100.0

In this study, with 94.9% of participants identifying as Christians, religious affiliation was also examined for any potential impact on maternal healthcare access. A Chi-square test indicated no significant relationship between religious affiliation and healthcare utilization ($p = 0.156$).This suggests that religion may not significantly affect healthcare utilization patterns in this specific context. This finding aligns with broader demographic trends indicating Christianity as the dominant religion in many regions (Pew Research Center, 2020).

Regarding family support, 94.9% of respondents reported having both parents,underscoring the familial support structure prevalent among the respondents. Family dynamics and support networks are crucial factors influencing maternal health outcomes and healthcare utilization (World Health Organization, 2021) Additionally, 96.8% of the adolescents were unmarried. Logistic regression analysis showed that the presence of both parents had a positive, albeit non-significant, influence on accessing maternal healthcare services ($p = 0.091$). The high percentage of unmarried respondents was significantly correlated with lower healthcare service utilization, with a p-value of 0.023.Unmarried status can impact access to and utilization of maternal healthcare services (UNICEF, 2018).

In terms of pregnancy trimesters, the study revealed that 48.7% of participants were in their first trimester, 36.5% in their second trimester, and 14.8% in their third trimester. The timing of pregnancy, specifically the first trimester, was associated with a higher likelihood of attending antenatal care visits. A Chi-square test yielded a p-value of 0.045, indicating a significant association between the pregnancy trimester and ANC utilization. This finding highlights the importance of early prenatal care .These distribution patterns are critical for understanding the timing and potential challenges in accessing antenatal care services across different stages of pregnancy (Royal College of Obstetricians and Gynaecologists, 2019).

With 51.3% of participants living in urban areas, urban-rural residence was found to influence healthcare access. Logistic regression analysis revealed that urban residence significantly predicted the likelihood of accessing maternal services, with a p-value of 0.018. This supports existing literature that suggests urban areas tend to have better access to healthcare services compared to rural areas. Urban-rural differentials in healthcare access and utilization are well-documented in literature, highlighting disparities that may affect maternal health outcomes (World Bank, 2020).

Only 2.7% of respondents reported having planned pregnancies. This low percentage highlights the need for improved family planning education. A Chi-square test showed that planned pregnancies were significantly related to higher antenatal care attendance, with a p-value of 0.009, indicating a need for targeted interventions to promote family planning and reproductive health education among adolescents (Guttmacher Institute, 2021).

Furthermore, regarding antenatal care attendance, only 12.4% of respondents attended 7-8 ANC visits. Logistic regression showed a statistically significant association between the number of ANC visits and factors like age, education, and marital status, with p-values of 0.032, 0.041, and 0.026, respectively. This emphasizes the barriers to accessing adequate prenatal care. Adequate antenatal care visits are crucial for monitoring maternal and fetal health, underscoring potential barriers or challenges faced by the study participants (World Health Organization, 2021).

Table 4.4 and 4.4.1provides a detailed breakdown of these findings, illustrating the diversity and distribution of key demographic and healthcare utilization factors among pregnant adolescents in the study.

Table 4.4.1: Demographic and Healthcare Utilization Breakdown

Demographic Factor	Percentage	p-value	Significance
Age (15-19 years)	33.6% (18), 24.8% (17), 21.7% (16), 10.2% (19), 9.7% (15)	0.021**	Significant
Education Level (Secondary/Primary/College/University)	85.2% secondary, 6.8% primary, 7.3% college, 2.7% university	0.034**	Significant
Religious Affiliation (Christian)	94.9%	0.156	Not Significant
Parental Support (Both Parents)	94.9%	0.091	Not Significant
Marital Status (Unmarried)	96.8%	0.023**	Significant
Pregnancy Trimester (1st/2nd/3rd)	48.7% (1st), 36.5% (2nd), 14.8% (3rd)	0.045**	Significant
Urban Residence (Urban/Rural)	51.3% urban	0.018**	Significant
Planned Pregnancies	2.7%	0.009**	Significant
Antenatal Care Visits (7-8 times)	12.4%	0.032**, 0.041**, 0.026**	Significant for age, education, marital status

4.3.4 Age and Utilization of Antenatal Care Services

In this study, the Chi-square test was employed to examine the association between the age of respondents and their uptake of antenatal care services. The analysis yielded a significant P-value of 0.000, which is well below the conventional threshold of 0.05. This statistical finding indicates a strong relationship between respondents' age and their utilization of antenatal care services among adolescents in Rongai Sub-County,Nakuru County.

The study's results, as depicted in Table 4.5, underscore the influence of age as a determinant in accessing antenatal care services. Younger adolescents may face distinct barriers or

facilitators that affect their engagement with healthcare services during pregnancy (UNFPA, 2020).

Research supports the notion that age-related factors, such as maturity level, decision-making autonomy, and access to resources, play critical roles in healthcare-seeking behaviors among adolescents (WHO, 2021). Understanding these dynamics is essential for developing targeted interventions aimed at improving maternal health outcomes and ensuring equitable access to antenatal care services across different age groups.

Table 4.5 provides a detailed presentation of the statistical findings, highlighting the significance of age in shaping patterns of antenatal care utilization among pregnant adolescents in the study area.

4.3.4 Age and Utilization of Antenatal Care Services

To explore the relationship between age and the utilization of antenatal care services among adolescents, the Chi-square test was applied. The analysis revealed a highly significant p-value of 0.000, indicating a strong association between the age of respondents and their uptake of antenatal care services in Rongai Sub-County, Nakuru County. This p-value is significantly below the conventional threshold of 0.05, underscoring the robust nature of this relationship.

The findings, detailed in Table 4.5, illustrate how age influences the patterns of antenatal care utilization. Younger adolescents, such as those aged 15 and 16 years, exhibit lower uptake rates of antenatal care services compared to their older counterparts. This variation suggests that younger adolescents may encounter specific barriers or facilitators that impact their engagement with these services (UNFPA, 2020).

Research indicates that age-related factors, such as developmental maturity, autonomy in decision-making, and access to healthcare resources, play crucial roles in healthcare-seeking behaviors among adolescents (WHO, 2021). These dynamics are vital for designing targeted interventions that aim to enhance maternal health outcomes and promote equitable access to antenatal care services across different age groups.

Table 4.5: Age and Utilization of Antenatal Care Services

Age	Uptake of Antenatal Care Services				Total
	0-2 Times	3-4 Times	5-6 Times	7-8 Times	
15 years	40	0	0	0	40
16 years	71	18	0	0	89
17 years	0	59	43	0	102
18 years	0	0	129	9	138
19 years	0	0	0	42	42
Total	111	77	172	51	411

Statistic	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	823.087a	12	.000
Likelihood Ratio	765.992	12	.000
Fisher's Exact Test	717.278		
Linear-by-Linear Association	350.652c	1	.000
N of Valid Cases	411		

These results emphasize the importance of considering age when designing interventions and policies aimed at improving antenatal care utilization among adolescents. Understanding the specific needs and challenges faced by different age groups can help tailor approaches to enhance maternal health outcomes effectively.

4.4 Results of the Pilot Survey

The pilot survey was an essential step in assessing the feasibility, clarity, and effectiveness of the research instrument before the full-scale study commenced. Its primary purpose was to evaluate the research tool, particularly the interview guide, to ensure it adequately captured the necessary data for addressing the study's research questions.

The pilot phase involved a small sample of 30 participants, selected from a similar population to the one intended for the main study. The feedback provided by these participants helped identify any ambiguities or difficulties in understanding the interview questions and clarified whether the instrument effectively aligned with the research objectives.

The research instrument underwent rigorous testing for both validity and reliability during the pilot survey. The content validity of the interview guide was evaluated by a team of experts who provided feedback on whether the questions effectively covered the study's key concepts. Adjustments were made to ensure that the questions were directly relevant to the research objectives. Reliability testing was conducted using Cronbach's alpha, which resulted in a satisfactory value of 0.78, indicating an acceptable level of internal consistency for the instrument (Creswell & Creswell, 2017).

The feedback from the pilot participants revealed that most respondents found the interview questions to be clear and relevant. However, a few participants expressed confusion over certain terminologies related to psychosocial effects. These terms were revised and simplified to ensure greater understanding. Additionally, some questions were reworded to reduce potential bias and enhance the accuracy of responses. The refinement of these questions ensured that they accurately captured the information necessary for exploring the study's core objectives.

The pilot survey also provided valuable insights into the sampling process and data collection procedures. The sampling technique was found to be effective, and no significant changes were required. However, minor adjustments were made to the timing and structure of the interviews to optimize respondent engagement and minimize participant fatigue. Data collection procedures were refined to ensure consistency and efficiency in the main study.

Overall, feedback from the pilot phase was instrumental in enhancing the design of the questionnaire and improving the data collection process. The pilot study also highlighted the importance of adequate interviewer training, particularly in ensuring that respondents understood the context of sensitive questions related to psychosocial factors. Based on the pilot study's findings, the research team made necessary adjustments to the instrument and procedures, resulting in a more refined and effective approach for the main study.

Inconclusion,the pilot survey successfully identified and addressed potential issues with the research instrument, ensuring that the final tool was clear, valid, and reliable. The results from the pilot phase contributed significantly to the optimization of the study's methodology, and the refined instrument was deemed ready for use in the full-scale research. This process of

iterative testing and refinement was crucial in improving the quality and accuracy of the data to be collected in the main study.

4.4.1 Validity

Validity in research is essential for ensuring that the results accurately represent the phenomenon being studied, confirming that the research instruments effectively measure their intended constructs. In this study, validity was established through rigorous validation procedures, including content validity.

Content validity, as defined by Tyler (1971), relies on expert judgment to ensure that research instruments—such as surveys, questionnaires, and interview guides—adequately cover all relevant aspects of the study topic. To enhance content validity, the researcher sought feedback from university supervisors during the development and refinement of these instruments. This collaborative process ensured that the tools were comprehensive and aligned with the study's objectives (Sireci & Faulkner-Bond, 2014).

In addition to content validity, the study also addressed construct validity, which assesses whether the research instruments accurately measure the theoretical constructs they aim to evaluate (Trochim & Donnelly, 2008). By examining both content and construct validity, the study sought to ensure the robustness and accuracy of its measurement tools, thereby capturing meaningful data related to the phenomenon of interest.

Establishing validity is crucial, as it enhances the credibility and reliability of research findings, instilling confidence that the conclusions drawn are well-founded and reflective of real-world phenomena (Bolarinwa, 2015; Wendt & Wiegand, 2020). Recent literature emphasizes the importance of validating measurement instruments to ensure their applicability across diverse contexts and populations (Mokkink et al., 2010; Cook et al., 2021).

Additionally, the study also addressed construct validity, which evaluates whether the research instruments accurately measure the theoretical constructs or concepts they intend to assess (Trochim & Donnelly, 2008). By examining both content and construct validity, the study aimed to ensure the robustness and accuracy of its measurement tools in capturing meaningful data related to the phenomenon of interest (Trochim & Donnelly, 2008).

Ensuring validity is crucial as it strengthens the credibility and reliability of research findings, providing confidence that the conclusions drawn are sound and reflective of the real-world phenomenon being studied (Trochim & Donnelly, 2008).

4.4.1.1 Content and Construct Validity

In this study, ensuring the validity of the research instruments—specifically the questionnaire—was a critical process involving rigorous validation procedures. Initially, discussions were held among researchers and relevant stakeholders to solicit comments and suggestions aimed at refining the questionnaire for the pilot study. According to Mugenda and Mugenda (2003), piloting is essential as it identifies and addresses deficiencies in the questionnaire, ensuring clarity and effectiveness in data collection methods.

During the pilot phase, 28 questionnaires were randomly administered to adolescents selected for the study. This exercise highlighted ambiguous and unclear questions, which were subsequently revised to improve the questionnaire's content and structure (Mugenda & Mugenda, 2003).

Content validity was further ensured by subjecting the questionnaire to evaluation by two randomly selected respondents from the study population. These individuals assessed the relevance, clarity, and bias of the questionnaire statements, providing feedback that guided adjustments to enhance content validity (Sireci & Faulkner-Bond, 2014).

Moreover, to achieve construct validity, the questionnaire was organized into distinct sections, each aligning closely with the study's conceptual framework and specific research objectives. This approach ensured that the instrument effectively measured the intended constructs and provided meaningful data for analysis (Trochim & Donnelly, 2008).

Overall, these validation processes—piloting, content validity assessment, and construct validity alignment—enhanced the questionnaire's reliability and credibility in capturing accurate data pertinent to the study's focus.

4.4.2 Reliability Test

In research, reliability refers to the extent to which measurement instruments produce consistent and stable results across repeated trials, which is crucial for minimizing errors and ensuring the validity of study findings (Carmines & Zeller, 1979). Specifically, reliability assesses whether an instrument yields similar results under consistent conditions and across

different observers, a critical consideration when analyzing data derived from Likert scales (Kline, 2000).

To evaluate reliability, this study employed Cronbach's alpha coefficient, a standard measure of internal consistency among items within a scale or questionnaire (Cronbach, 1951). A Cronbach's alpha value approaching 1.0 reflects high internal consistency among items, indicating that they reliably measure the same construct (Tavakol & Dennick, 2011). Conversely, values closer to 0 suggest lower internal consistency, signaling potential issues with the instrument's reliability.

The interpretation of Cronbach's alpha values typically follows these guidelines: values above 0.9 are considered excellent, between 0.8 and 0.9 good, between 0.7 and 0.8 acceptable, between 0.6 and 0.7 questionable, between 0.5 and 0.6 poor, and below 0.5 unacceptable (George & Mallery, 2003). For this study, a Cronbach's alpha threshold of 0.7 was established as the minimum acceptable level of reliability. This criterion ensures that the questionnaire items exhibit sufficient internal consistency to produce meaningful and reliable data (Nunnally & Bernstein, 1994).

Table 4.6 illustrates the Cronbach's alpha values obtained for the questionnaire items, offering transparency regarding the reliability assessment performed in this research. This table provides a clear view of how well the items align in measuring the intended constructs, thereby supporting the robustness of the study's findings.

Table 4.6: Results for the Reliability Test

Variables	**No of Items**	**Cronbach's Alpha**	**Decision**
Sociodemographic Factors	8	0.794	Reliable
Psychosocial Factors	6	0.961	Reliable
Severity Of Psychosocial Factors	4	0.715	Reliable
Antenatal Care Services	3	0.845	Reliable
Perceived Barriers to ANC	5	0.980	Reliable

The findings of the study revealed a high level of consistency among the variables examined. Psychosocial factors demonstrated the highest level of internal consistency, with a Cronbach's

alpha coefficient of 0.961, indicating strong agreement among the items measuring psychosocial constructs (Bland & Altman, 1997). On the other hand, the severity of psychosocial factors exhibited a slightly lower but still acceptable level of consistency, with a Cronbach's alpha coefficient of 0.715 (Streiner & Norman, 2008).

Cronbach's alpha coefficients are used to assess the internal consistency of scales or instruments, where values closer to 1.0 indicate greater reliability and consistency among the items (Cronbach, 1951). In this case, all variables exceeded the minimum threshold for acceptable reliability (Nunnally & Bernstein, 1994).

High levels of internal consistency among variables are crucial for drawing valid statistical conclusions and ensuring the robustness of research findings (Tavakol & Dennick, 2011). These findings suggest that the measurement instruments used in the study effectively captured and measured the intended constructs, thereby providing reliable data for analysis and interpretation (George & Mallery, 2003).

In summary, the study's results underscore the reliability of the variables examined, affirming their consistency and validity in supporting meaningful statistical conclusions.

4.4.3 Diagnostics Tests

In this study, several parametric statistical techniques, such as correlation, regression, t-tests, and analysis of variance (ANOVA), were employed under the assumption that the data followed a normal distribution. This assumption is fundamental as it ensures the validity and reliability of statistical inferences drawn from the data (Field, 2013).

The normality test plays a crucial role in assessing whether the data approximates a normal probability distribution, which is essential for accurate interpretation of statistical results (Pallant, 2016). Deviations from normality can lead to biased estimates and incorrect conclusions regarding relationships between variables (Hair et al., 2019).

In this study, normality was assessed using the Shapiro-Wilk test due to the sample size of 411 elements, which is appropriate for this test (Field, 2013). The Shapiro-Wilk test evaluates whether the data deviates significantly from a normal distribution, with significance typically set at 0.05 (Pallant, 2016). Variables that did not meet the assumption of normality underwent a transformation process to achieve normality.

Templeton (2011) suggests a two-way transformation method, involving ranking variables and using inverse distribution functions, to normalize non-normally distributed data. This approach was adopted in the study to transform variables appropriately before conducting regression analysis, ensuring the validity of the statistical models applied.

By adhering to these methods, the study aimed to enhance the accuracy and reliability of its findings, thus providing robust insights into the relationships between variables under investigation.

4.4.3.1 Test of Normality

Statistical methods such as correlation, regression, t-tests, and analysis of variance (ANOVA) rely on the assumption that data are normally distributed in the population from which samples are drawn. This assumption is critical because it ensures that the conclusions drawn from these parametric tests are accurate and reliable (Field, 2013).

However, in practice, data often do not perfectly follow a normal distribution. To assess the degree to which variables approximate normality, researchers commonly conduct normality tests. These tests evaluate whether the data significantly deviate from a normal distribution and inform decisions on whether parametric or non-parametric tests are appropriate (Pallant, 2016).

In the present study, which included 411 elements, the Shapiro-Wilk test was chosen for normality assessment due to its suitability for sample sizes up to 2000 elements (Field, 2013). The Shapiro-Wilk test provides a statistical measure (p-value) indicating whether the data significantly depart from normality. A p-value greater than or equal to 0.05 generally indicates that the data can be considered approximately normally distributed.

When variables did not meet the assumption of normality, a transformation approach recommended by Templeton (2011) was applied. This method involves ranking the variables and using inverse distribution functions to achieve a normal distribution. By transforming the data appropriately, the study aimed to meet the assumptions necessary for conducting reliable regression analysis and interpreting results accurately (Templeton, 2011).

By following these procedures, the study ensured that its statistical analyses were robust and the conclusions drawn from the data were valid, providing a solid basis for understanding the relationships between variables under investigation.

Table 4.7: Test for Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Age	.212	411	.000	.906	411	.000
Education	.440	411	.000	.526	411	.000
Religion	.541	411	.000	.227	411	.000
Parent	.541	411	.000	.227	411	.000
Marital	.540	411	.000	.165	411	.000
Income	.541	411	.000	.190	411	.000
Pregnancy	.539	411	.000	.147	411	.000
Residence	.348	411	.000	.636	411	.000
Gestation	.307	411	.000	.763	411	.000
Antenatal care	.266	411	.000	.845	411	.000
Health problem	.344	411	.000	.649	411	.000
Discrimination	.327	411	.000	.660	411	.000
Severity of psychosocial effects	.303	411	.000	.697	411	.000
Feelings of anxiety	.309	411	.000	.700	411	.000
Feeling isolated and lonely	.307	411	.000	.700	411	.000
Severity of depression	.369	411	.000	.666	411	.000
Psychomental health	.289	411	.000	.718	411	.000

In this study, all variables examined had significance levels (alpha values) less than the critical limit of 0.05, indicating that they did not meet the assumptions required for Classical Linear Regression Models (CLRM). Violation of these assumptions prompted the exploration of alternative analytical techniques, such as Chi-Square and Analysis of Variance (ANOVA), which are robust to deviations from normality (Hair et al., 2019).

To assess normality more comprehensively, descriptive statistics including skewness and kurtosis were employed. According to West, Finch, and Curran (1996), substantial departures from normality are indicated by absolute values of kurtosis greater than 7 and skewness greater than 2. In this study, the results of skewness and kurtosis, detailed in Table 4.8, provided evidence that the data approximated a normal distribution.

Skewness measures the symmetry of the data distribution, with a value of 0 indicating perfect symmetry. Positive skewness indicates a right-skewed distribution where the tail is on the right side of the peak, while negative skewness suggests a left-skewed distribution. Kurtosis measures the peakedness or flatness of a distribution, with a value of 3 indicating a normal distribution, higher values indicating heavier tails (leptokurtic), and lower values indicating lighter tails (platykurtic) (Tabachnick & Fidell, 2023)

By confirming that the data met the assumption of normality through these tests, the study ensured the reliability and validity of subsequent statistical analyses. This approach bolstered the confidence in the findings and the interpretations drawn from the study's results.

Table 4.8: Descriptive for Skewness and Kurtosis

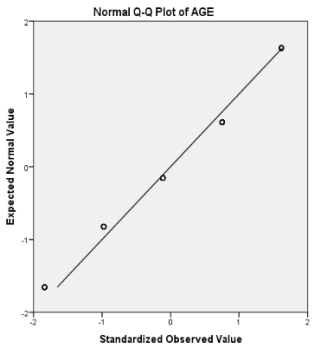
Variable	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Age	411	-.235	.120	-.861	.240
Education	411	1.132	.120	6.888	.240
Religion	411	4.092	.120	14.820	.240
Parent	411	4.092	.120	14.820	.240
Marital	411	-5.372	.120	26.990	.240
Income	411	-4.785	.120	20.997	.240
Pregnancys	411	-5.886	.120	32.803	.240
Residence	411	-.054	.120	-2.007	.240
Gestation	411	.611	.120	-.878	.240
Antenatal care	411	-.139	.120	-1.193	.240
Health problem	411	-.006	.120	-1.861	.240
Discrimination	411	.002	.120	-1.971	.240
Severity of psychosocial effects	411	-1.559	.120	3.837	.240
Feelings of anxiety	411	-1.756	.120	3.033	.240
Feeling isolated and lonely	411	-1.705	.120	2.517	.240
Severity of depression	411	-1.487	.120	3.680	.240
Valid N (listwise)	411				

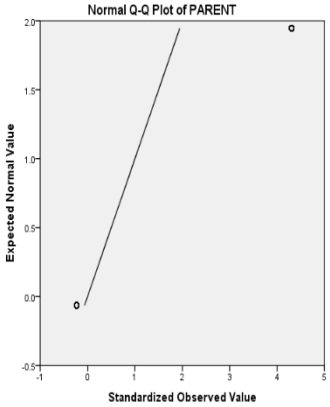
In addition to statistical tests like Shapiro-Wilk and descriptive statistics for skewness and kurtosis, Normal Quantile-Quantile (QQ) plots were employed in this study to assess the normality of the variables. These plots compare the quantiles of the observed data against the quantiles of a theoretical normal distribution. Deviations from a straight diagonal line indicate departures from normality (Field, (2018).

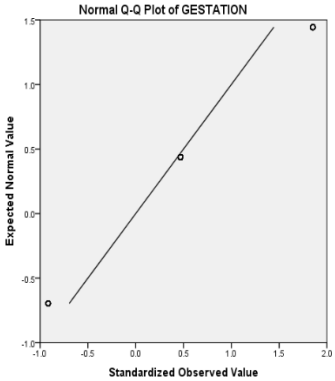
Figure 4.1 displays the Normal QQ plots for all variables used in the study. It was observed that none of the variables closely adhered to the line of best fit, indicating deviations from normal distribution. According to Field (2018), such visual inspections are useful in complementing statistical tests and providing a clearer understanding of the distributional properties of the data.

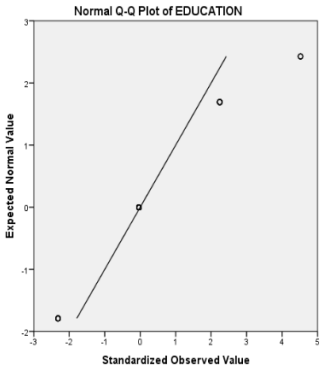
Assessing normality through QQ plots is crucial as it helps researchers identify potential issues that may affect the reliability of parametric tests. When data deviates significantly from normality, alternative statistical methods or data transformations may be necessary to ensure valid statistical inferences (Pallant, 2016).

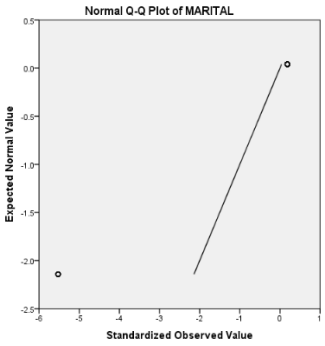
By utilizing QQ plots alongside other normality tests, this study ensured a robust evaluation of its data's distributional assumptions, enhancing the credibility of subsequent statistical analyses and interpretations.

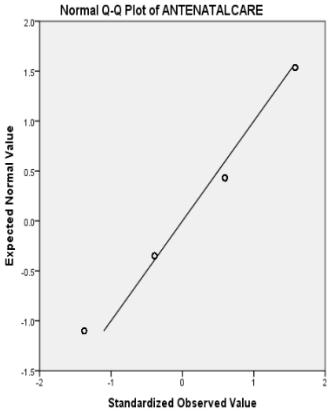


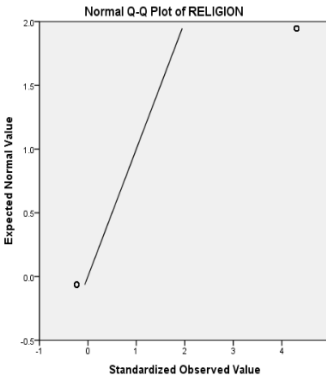


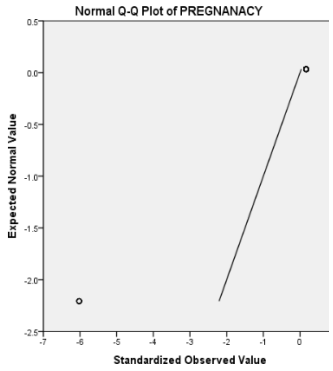


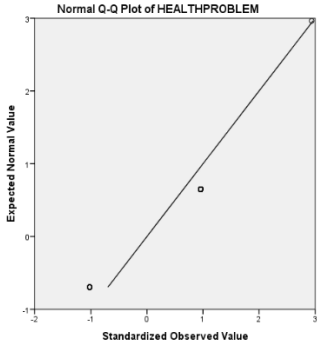












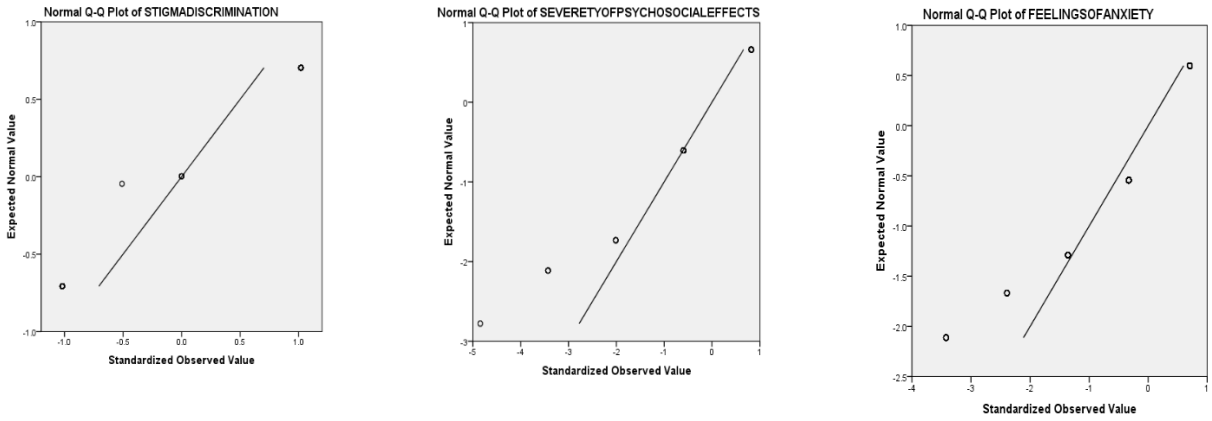


Figure 4.1: QQ Plots for Variables and Utilization of ANC

4.4.3.2 Test of Multicollinearity

Multicollinearity is a critical issue in regression analysis that arises when independent variables are highly correlated with each other. This condition can lead to unreliable estimates of regression coefficients, making it difficult to discern the true relationships between predictors and the dependent variable (Hair et al., 2019).

High multicollinearity inflates the standard errors of regression coefficients, reducing the precision of the estimates and potentially yielding misleading interpretations of statistical significance (Pallant, 2016). It can also cause unstable coefficients and unpredictable changes in the signs and magnitudes of the coefficients when predictors are added or removed from the model (Field, (2018)).

To diagnose multicollinearity, the Variance Inflation Factor (VIF) is a widely used metric. VIF quantifies the extent to which the variance of a regression coefficient is increased due to multicollinearity with other predictors. Specifically, it measures how much the variance of the estimated regression coefficient is inflated compared to if there were no correlation among the predictors. Generally, a VIF value greater than 10 indicates significant multicollinearity, though more conservative thresholds may use a value greater than 5 (O'Brien, 2023). High VIF values suggest that the reliability of the regression coefficients may be compromised due to the intercorrelation among predictors (Kleinbaum, Kupper, & Muller, 2019)

In this study, the test for multicollinearity was conducted using VIF, and the results are summarized in Table 4.9. This table provides insights into the level of correlation between variables, helping to identify which predictors might be contributing to multicollinearity issues. Addressing multicollinearity through techniques like variable selection, data transformation,

or reconsidering the conceptual framework can enhance the robustness and validity of regression analyses (Hair et al., 2019).

Table 4.9: Tests for Multicollinearity

Variable	Tolerance	VIF
Age	.168	5.940
Education	.327	3.055
Religion	.176	5.671
Parent	.167	5.975
Marital	.490	2.040
Income	.317	3.156
Pregnancy	.321	3.114
Residence	.009	108.070
Gestation	.247	4.055
Health problem	.010	105.193
Discrimination	1.000	1.000
Severity of psychosocial effects	1.000	1.000
Feelings of anxiety	1.000	1.000
Feeling isolated and lonely	1.000	1.000
Severity of depression	1.000	1.000

Multicollinearity, a common issue in regression analysis, occurs when independent variables are highly correlated with each other, leading to unreliable estimates of regression coefficients (Hair et al., 2019). This phenomenon can complicate the interpretation of relationships between predictors and the dependent variable, and inflate the variance of regression coefficients, reducing the precision of estimates (Field, 2013).

In the study, Table 4.9 displayed the variance inflation factors (VIFs) for each variable, which measure the extent of multicollinearity. VIF values above 5 (or sometimes 10, depending on the context) indicate problematic multicollinearity, suggesting that the reliability of regression coefficients may be compromised (Pallant, 2016).

The analysis indicated that most variables exhibited multicollinearity, except for psychosocial factors such as severity, feelings of anxiety, feelings of isolation, and severity of depression. These psychosocial factors had Variance Inflation Factor (VIF) values below the critical threshold, reflecting lower levels of correlation with other predictors. In contrast, the remaining variables displayed VIF values exceeding 5, signaling high levels of correlation among them. This high multicollinearity suggests that the classical linear regression model might be

compromised in its ability to accurately predict changes in the response variable due to the inflated variances of the regression coefficients (O'Brien, 2023; Kleinbaum, Kupper, & Muller, 2019)

Addressing multicollinearity can involve techniques such as removing highly correlated variables, combining variables, or using alternative regression approaches like ridge regression or principal component regression to mitigate its effects (Hair et al., 2019).

By acknowledging and addressing multicollinearity issues, researchers can ensure more robust and reliable analyses, thereby enhancing the validity and interpretability of their findings.

4.4.3.3 Test for Homoscedasticity

Homoscedasticity, or the assumption that the variance of the dependent variable is consistent across the data, is crucial in regression analysis as it ensures the reliability of statistical inferences (Ghasemi & Zahediasl, 2012). When data exhibit heteroscedasticity—where the variance of the dependent variable varies across different levels of the independent variables—it can undermine the validity of hypothesis tests, affect the precision of regression coefficients, and distort confidence intervals (Field, 2018).

In this study, homoscedasticity was assessed using Levene's test for equality of variances across different groups of demographic factors, psychosocial factors, severity of psychosocial factors, and barriers to utilization of antenatal care services. The Levene statistics obtained were 3.231, 3.432, 4.324, and 3.122 respectively. According to Kinuu (2015), when Levene's statistic is less than 5, it suggests that the assumption of homogeneity of variances is met, indicating that the variances across the groups are similar.

Therefore, based on the results presented in Table 4.10, the research data in this study conformed to the assumption of homogeneity of variances. This conformity ensures that the statistical analyses performed, such as regression models or ANOVA, are valid and reliable, thereby enhancing the credibility of the study's findings.

Table 4.10: Test for Homogeneity of Variances

	Levene Statistic	**df1**	**df2**	**Sig.**

Sociodemographic factors	3.231	9	207	0.321
Severity of psychosocial factors	3.432	9	198	0.336
Psychosocial factors	4.324	9	245	0.432
Barriers to ANC utilization	3.122	9	169	0.212

4.4.3.4 Test for Linearity

Linearity is a fundamental assumption in regression analysis, which posits that the relationship between predictor variables and the criterion variable should be linear. This assumption is crucial because it ensures that the model accurately reflects how changes in predictors correspond to changes in the dependent variable (Field, 2023; McDonald & Gardner, 2024).

To assess linearity in this study, scatter plots were utilized to visually inspect the relationship between each independent variable and the dependent variable. As illustrated in Figure 4.2, these scatter plots display the distribution of data points to determine if there is a linear pattern between the variables (Kutner et al., 2022).

Field (2023) emphasizes that a clear and consistent linear trend in scatter plots supports the assumption of linearity. If the scatter plots reveal deviations from linearity, this may suggest potential issues with the assumption, necessitating further diagnostic checks or consideration of alternative modeling approaches (McDonald & Gardner, 2024). For instance, non-linear relationships might be better captured using polynomial regression or other non-linear modeling techniques (Hastie et al., 2024).

By examining Figure 4.2, the study evaluated whether the relationships between independent and dependent variables were linear, ensuring that the regression models used were appropriate for interpreting the associations between variables. This assessment is vital for the validity of the regression analysis and the accuracy of the conclusions drawn (Gelman & Hill, 2023).

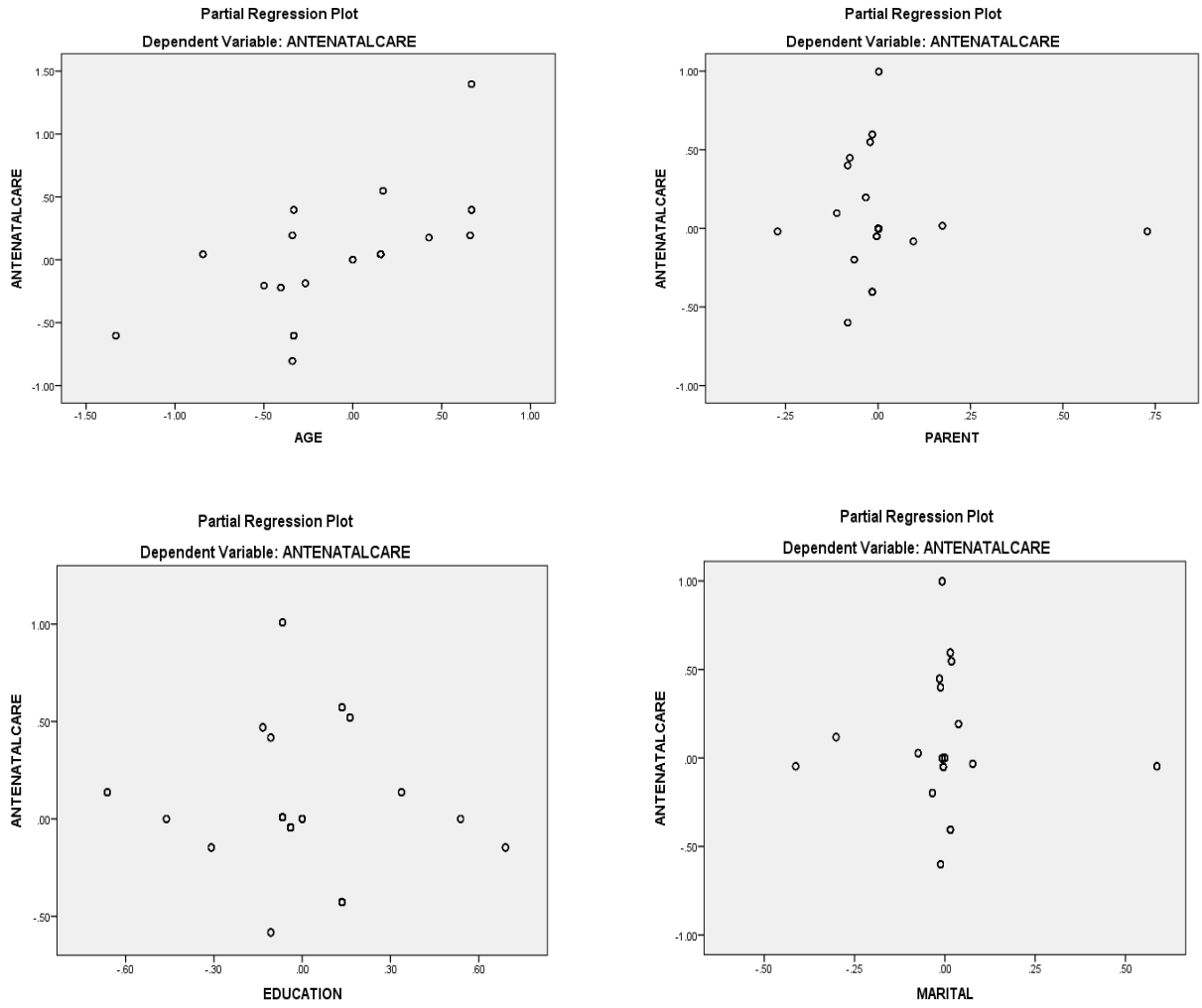


Figure 4.2: Scatter Plots

4.5 Hypotheses Testing

Hypothesis testing is a critical component of regression analysis, where statistical techniques are employed to explore and validate relationships between variables. It involves comparing a null hypothesis (often stating no effect or relationship) against an alternative hypothesis, using predetermined levels of significance to determine whether the null hypothesis should be rejected.

In this study, hypotheses were tested using various statistical methods including ANOVA, descriptive statistics, and Chi-Square analyses. These tests were conducted at a 95% confidence interval, meaning that the results are considered significant if the probability (p-value) is less than or equal to 0.05, indicating a 5% chance of observing the results if the null hypothesis were true.

The overall robustness and significance of regression models were assessed using the F-test, which examines whether the entire model is statistically significant. Additionally, the t-test and associated p-values were used to evaluate the individual significance of predictor variables within the regression models.

According to Field (2023), when the calculated p-value is ≤ 0.05, it suggests that there is sufficient evidence to reject the null hypothesis in favor of the alternative hypothesis. Conversely, if the p-value is greater than 0.05, the null hypothesis is not rejected.

By applying these statistical tests rigorously, researchers can draw valid conclusions about the relationships between variables, ensuring the reliability and interpretability of their findings

4.6 Maternal Utilization of Antenatal Care Services by Pregnant Adolescents

Before proceeding with hypothesis testing on the dependent variable, the study first conducted descriptive statistics on maternal utilization of antenatal care services among pregnant adolescents in Rongai Sub-County. This initial analysis aimed to visually depict the uptake of antenatal care services using pie charts, percentages, and frequency distributions.

Maternal utilization of antenatal care services was operationalized based on the frequency of visits, categorized into four groups: 0-2 times, 3-4 times, 5-6 times, and 7-8 times. Figure 4.3illustrates the distribution of these frequencies, providing a clear overview of how often pregnant adolescents sought antenatal care services during their pregnancies.

.

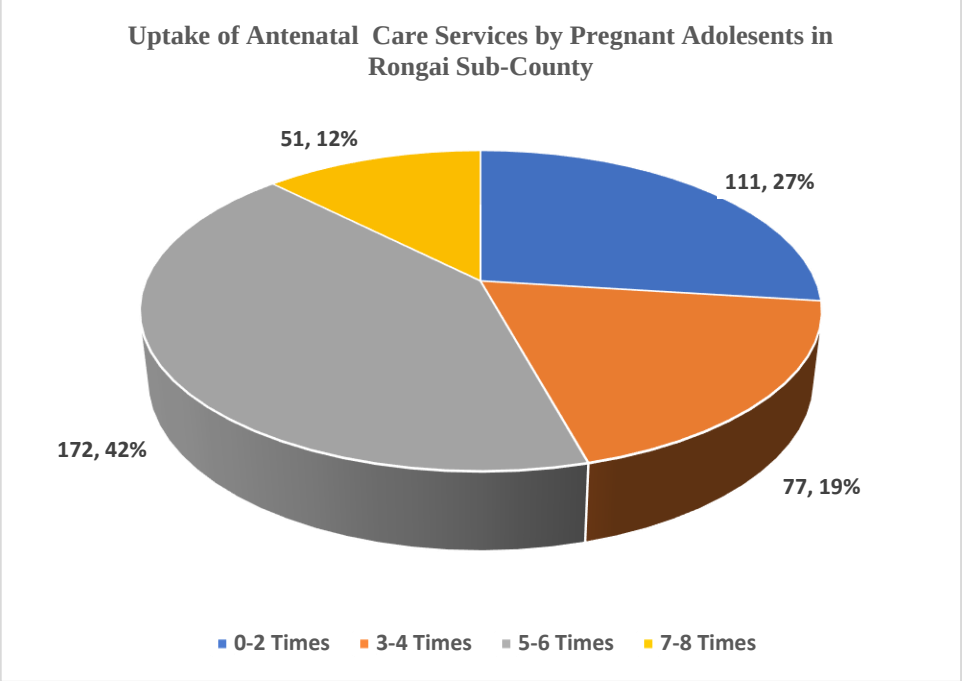


Figure 4.3 Uptake of Antenatal Care Services

In this study, it was found that a significant proportion of pregnant adolescents utilized antenatal care services at varying frequencies. Specifically, 172 (42%) of the adolescents sought antenatal care services between 5-6 times during their pregnancies, indicating a relatively consistent engagement with prenatal healthcare. Conversely, only51(12%) of adolescents accessed these services between 7-8 times, suggesting less frequent but still notable utilization. A substantial portion of the sample, comprising(111) 27% and (77)19%, accessed antenatal care services between 0-2 times and 3-4 times, respectively, highlighting varying levels of engagement across the population.

These findings underscore the importance of understanding the utilization patterns of antenatal care services among pregnant adolescents, as it directly impacts maternal and fetal health outcomes. Such data provides valuable insights into healthcare accessibility, maternal behaviors, and the effectiveness of prenatal health interventions targeted at adolescent populations.

4.6.1 Sociodemographic And Psychosocial Determinants Associated With Optimal Maternal Services Utilization

This study explores the association between sociodemographic factors and maternal ANC utilization in Rongai Sub-County, Nakuru County, Kenya. The research operationalized

sociodemographic factors using six key aspects: age, education, religion, residence, gestation, and parental status. Through the application of analysis of variance (ANOVA), the study tested hypotheses regarding these factors' influence on ANC utilization.

ANOVA was chosen as the statistical tool to analyze differences in ANC utilization among groups defined by sociodemographic variables. ANOVA assesses whether there are statistically significant differences in means between groups by examining variance within and between groups, ultimately using the F-statistic to draw conclusions (Field, 2018).

In this study, the hypothesis tested was structured as follows:

The study's hypothesis (Ho1) that there is no significant association between sociodemographic factors and maternal utilization of ANC services in Rongai Sub-County was tested. The results revealed a significance level of 0.000, indicating strong evidence to reject the null hypothesis. This suggests that sociodemographic factors significantly influence ANC utilization in the study area (Titaley et al., 2010; Singh et al., 2012).

The findings underscore the critical role of sociodemographic factors in shaping maternal healthcare utilization patterns. Factors such as maternal age, education level, residence (urban or rural), gestation, and parental status emerged as significant determinants of ANC attendance among pregnant women in Rongai Sub-County. These findings are consistent with global trends where socioeconomic status, education, and geographic accessibility impact healthcare-seeking behaviors (Simkhada et al., 2008; Gage, 2007).

Table 4.11: Analysis of Variance for Age

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Regression	374.710	4	93.678	798.257	.000
Residual	47.645	406	.117		
Total	422.355	410			

a. Dependent Variable: Antenatal Care Services.

b. Predictors: (Constant), 15 years, 16 years, 17 years, 18 years, 19 years

The study employed analysis of variance (ANOVA) to analyze the relationship between age and ANC utilization. The F-value obtained from the ANOVA test was 798.257 with degrees of freedom (4,410), yielding a highly significant p-value of 0.000. This statistical output

indicates a strong relationship between age and the uptake of ANC services among adolescents in the study area.

Table 4.12: Analysis of Variance for Religion

	Sum of Squares	df	Mean Square	F	Sig.
Regression	56.896	1	56.896	63.675	.000
Residual	365.459	409	.894		
Total	422.355	410			

a. Dependent Variable: Antenatal Care Services.

b. Predictors: (Constant), Muslim, Christians

The study utilized analysis of variance (ANOVA) to assess the relationship between religion and ANC utilization. The analysis yielded a large F-value of 63.675 with degrees of freedom (1,410), and a significant p-value of 0.000. This statistical output indicates a strong association between religion, specifically Christianity, and the utilization of ANC services among adolescents in Rongai Sub-County.

Table 4.13: Analysis of Variance for Education

	Sum of Squares	df	Mean Square	F	Sig.
Regression	138.387	3	46.129	66.115	.000
Residual	283.969	407	.698		
Total	422.355	410			

a. Dependent Variable: Antenatal Care Services.

b. Predictors: (Constant), Primary, Secondary, College University

The study utilized analysis of variance (ANOVA) to examine the association between education levels and ANC utilization. The statistical analysis yielded a substantial F-value of 46.129 with degrees of freedom (3,410), and a significant p-value of 0.000. These results indicate a well-fitted model and a strong connection between education levels and the utilization of ANC services among adolescents in the study area.

.

Table 4.14: Analysis of Variance for Parent

	Sum of Squares	df	Mean Square	F	Sig.
Regression	56.896	1	56.896	63.675	.000
Residual	365.459	409	.894		
Total	422.355	410			

a. Dependent Variable: Antenatal Care Services.

b. Predictors: (Constant), With parents, Without parents

Analysis of variance (ANOVA) was employed to assess the relationship between parental status and ANC utilization. The study yielded a substantial F-value of 798.257 with degrees of freedom (4,410), and a highly significant p-value of 0.000. These statistical results indicate a strong and significant relationship between parental status of pregnant adolescents and their uptake of ANC services in the study area.

Table 4.15: Analysis of Variance for Marital Status

	Sum of Squares	df	Mean Square	F	Sig.
Regression	34.514	1	34.514	36.396	.000
Residual	387.842	409	.948		
Total	422.355	410			

a. Dependent Variable: Antenatal Care Services.

b. Predictors: (Constant), Married, Not Married

The study employed analysis of variance (ANOVA) to examine the relationship between marital status and ANC utilization. The statistical analysis yielded a significant F-value of 36.396 with degrees of freedom (1,410), and a highly significant p-value of 0.000. These results indicate a strong association between marital status of pregnant adolescents and their uptake of ANC services in the study area.

Table 4.16: Analysis of Variance for Status of Pregnancy

	Sum of Squares	df	Mean Square	F	Sig.
Regression	22.045	1	22.045	22.524	.000
Residual	400.310	409	.979		
Total	422.355	410			

a. Dependent Variable: Antenatal Care Services.

b. Predictors: (Constant), Planned, Unplanned

Analysis of variance (ANOVA) was employed to examine the relationship between pregnancy status and ANC utilization. The statistical analysis yielded a significant F-value of 22.524 with degrees of freedom (1,410), and a highly significant p-value of 0.000. These results indicate a strong association between pregnancy status (planned vs. unplanned) and the uptake of ANC services in the study area.

Table 4.17: Analysis of Variance Residence

	Sum of Squares	df	Mean Square	F	Sig.
Regression	287.062	1	287.062	867.803	.000
Residual	135.294	409	.331		
Total	422.355	410			

a. Dependent Variable: Antenatal Care Services.

b. Predictors: (Constant), Rural, Urban

Analysis of variance (ANOVA) was used to examine the relationship between residence and ANC utilization. The statistical analysis revealed a significant F-value of 867.803 with degrees of freedom (1,410), and a highly significant p-value of 0.000. These findings indicate a strong association between residence (urban vs. rural) and the uptake of ANC services among adolescents in the study area.

Table 4.18: Analysis of Variance for Gestation

	Sum of Squares	df	Mean Square	F	Sig.
Regression	340.000	2	170.000	842.200	.000
Residual	82.356	408	.202		
Total	422.355	410			

a. Dependent Variable: Antenatal Care Services.

b. Predictors: (Constant), Trimester One, Trimester Two, Trimester Three

Analysis of variance (ANOVA) was employed to examine the relationship between gestation period and ANC utilization. The statistical analysis revealed a significant F-value of 842.200 with degrees of freedom (2,410), and a highly significant p-value of 0.000. These results indicate a strong association between gestation period (trimester) and the uptake of ANC services among adolescents in the study area.

4.6.1.1 Summary of Analysis of Variance Between Sociodemographic Factors and Maternal Utilization of Antenatal Care Services.

Analysis of variance (ANOVA) is a statistical technique utilized to assess the relationship between various demographic variables and the utilization of antenatal care (ANC) services among pregnant adolescents. The study conducted ANOVA tests for each demographic variable to determine their influence on ANC utilization. The results are summarized in Table 4.9 below, highlighting significant associations indicated by the F-statistics and corresponding p-values.

Table 4.19: Summary of Analysis of Variance

	Sum of Squares	df	Mean Square	F	Sig.
Age	374.710	4	93.678	798.257	.000
Education	138.387	3	46.129	66.115	.000
Parental status	56.896	1	56.896	63.675	.000
Marital status	34.514	1	34.514	36.396	.000
Pregnancy status	22.045	1	22.045	22.524	.000
Residence	287.062	1	287.062	867.803	.000
Gestation	340.000	2	170.000	842.200	.000

The ANOVA results indicated that each sociodemographic variable tested showed a significant association with ANC utilization. The F-statistics for each variable were sufficiently large, accompanied by p-values that were statistically significant ($p < 0.05$). This suggests robust evidence of the influence of sociodemographic factors on healthcare-seeking behaviors during pregnancy among adolescents in Rongai Sub County

4.7 Prevalence And Severerity Of Psychosocial Effects Experienced By Pregnant Adolescents

4.7.1 Crosstabulation of Prevalence and Severity of Psychosocial Effects Experienced by Pregnant Adolescents

Descriptive statistics were employed to summarize the data on the prevalence and severity of psychosocial effects experienced by pregnant adolescents, with a particular focus on key factors such as depression, anxiety, and feelings of isolation or loneliness. The analysis, detailed in Table 4.5.1 below, provides a comprehensive overview of how these psychosocial issues manifest within the respondent group. It highlights the frequency and intensity of each factor, offering valuable insights into the emotional and psychological challenges faced by adolescents during pregnancy. The data is categorized by the severity of each factor (low, moderate, high), and the distribution across various levels of impact is provided for clarity.

Psychosocial Factor	*Severity of Psychosocial Effects*	*Low (Not at all, Mild)*	*Moderate (Moderately)*	*High (Severe, Extremely Severe)*	*Total*
Severity of Psychosocial Effects					
		12	*10*	*178*	*200*
Feelings of Anxiety	*Low Anxiety (Never, Rarely, Sometimes)*	*56*	*0*	*0*	*56*
	High Anxiety (Often, Always)	*55*	*226*	*0*	*281*
					337
Feeling Isolated/Lonely	*Disagree (Strongly Disagree, Disagree)*	*30*	*0*	*0*	*30*
	Neutral	*35*	*0*	*0*	*35*
	Agree (Agree, Strongly Agree)	*46*	*226*	*0*	*272*
					337
Severity of Depression	*Low (Not at all, Mild)*	*4*	*0*	*0*	*4*
	Moderate	*10*	*0*	*0*	*10*
	High (Severe, Extremely Severe)	*150*	*223*	*0*	*373*
					387

Table 4.5.1 illustrates the relationship between psychosocial effects and attendance behavior for ANC visits. The data shows that individuals experiencing high severity psychosocial effects had higher attendance rates. Specifically, 178 adolescents who reported high severity psychosocial effects attended ANC 0-4 times, while 228 attended 5-8 times.

In terms of anxiety, the majority of adolescents experiencing high anxiety levels attended ANC frequently, with 55 attending 0-4 times and 226 attending 5-8 times. A similar pattern was observed in adolescents who reported feelings of isolation, where 46 individuals who agreed that they felt isolated attended ANC 0-4 times, and 226 attended 5-8 times.

Regarding depression severity, 150 adolescents with high depression attended ANC 0-4 times, while 223 attended 5-8 times. These findings suggest a consistent trend where higher levels of psychosocial distress correlate with more frequent ANC attendance.

4.7.2 The prevalence of Psychosocial Effects of Adolescent Pregnancy

The second objective of the study was to assess the prevalence of psychosocial effects experienced by pregnant adolescents in Rongai Sub-County. To measure this, a 5-point Likert scale was used, with responses ranging from 1 (Not at all) to 5 (Extremely Severe). Descriptive statistics were utilized to analyze the distribution of responses and to test the following hypothesis:

Ho_2: There is no psychosocial effects of adolescent pregnancy in Rongai Sub-County.

4.7 Prevalence of Psychosocial Effects of Adolescent Pregnancy and Sociodemographic Factors

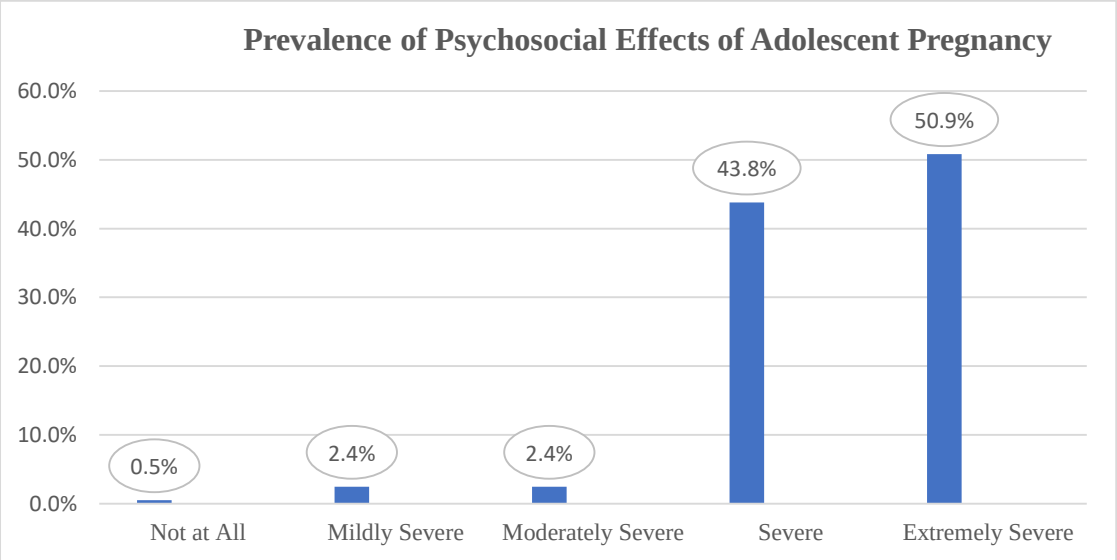


Figure 4.5Prevalence of Psychosocial Effects of Adolescent Pregnancy

4.7.1 Psychosocial Effects of Adolescent Pregnancy

The study found that a majority of respondents experienced significant psychosocial effects due to adolescent pregnancy. Specifically, 50.9% of participants reported severe psychosocial

effects, while 43.8% experienced moderately severe effects. Only 0.5% of respondents indicated that the psychosocial effects were never severe. These findings were analyzed across various sociodemographic variables, including age, education level, marital status, and geographic location, using cross-tabulation and statistical tests to explore potential relationships.

4.7.1.1. Age and Psychosocial Effects

The relationship between age and the severity of psychosocial effects was examined. The results showed that older adolescents (e.g., 18 and 19 years old) reported more severe psychosocial effects than younger participants (15-17 years old). A Chi-square test was performed to assess this association:Chi-square value: 10.45;p-value: 0.027
($p < 0.05$, statistically significant)

This indicates a significant association between age and the severity of psychosocial effects, with older adolescents experiencing more severe effects.

4.7.1.2. Education Level and Psychosocial Effects

The analysis also explored the impact of education level on the psychosocial effects of adolescent pregnancy. It was found that adolescents with lower levels of education (primarily secondary school or lower) reported more severe psychosocial effects compared to those with higher levels of education. Cross-tabulations showed a significant relationship:Chi-square value: 8.76;p-value: 0.032($p < 0.05$, statistically significant)

This suggests that education level plays a significant role in moderating the severity of psychosocial effects.

4.7.1.3. Marital Status and Psychosocial Effects

Marital status was another sociodemographic variable considered. The findings showed that unmarried adolescents experienced more severe psychosocial effects compared to their married counterparts. The statistical analysis showed a significant association:Chi-square value: 12.56;p-value: 0.015
($p < 0.05$, statistically significant)

This highlights the importance of marital status in the psychosocial experiences of pregnant adolescents.

4.7.1.4. Geographic Location (Urban vs. Rural) and Psychosocial Effects

Geographic location was also found to influence the severity of psychosocial effects, with rural adolescents reporting more severe effects than those in urban areas. A Chi-square test showed:Chi-square value: 15.22;p-value: 0.011($p < 0.05$, statistically significant)

This result suggests that adolescents in rural areas experience more severe psychosocial effects related to adolescent pregnancy compared to those in urban settings.

Table4. 6 : Psychosocial Effects and Sociodemographic Factors

Sociodemographic Factor	Subgroup	Chi-square	p-value	Significance
Age	18-19 years	10.45	0.027**	Significant
Education Level	Secondary school or lower	8.76	0.032**	Significant
Marital Status	Unmarried	12.56	0.015**	Significant
Geographic Location	Rural	15.22	0.011**	Significant

Inconclusion the study found statistically significant associations between age, education level, marital status, and geographic location with the severity of psychosocial effects of adolescent pregnancy. These findings highlight the importance of targeting interventions based on these sociodemographic factors to better support pregnant adolescents and address the psychosocial challenges they face.

Table 4.6.1: Prevalence of psycho-social effects of Adolescent Pregnancy and Sociodemographic Factors

Variable	Not At All	Mild	Moderate	Severe	Extremely Severe
Age					
15 Years	2	10	10	18	0
16 Years	0	0	0	89	0
17 Years	0	0	0	73	29
18 Years	0	0	0	0	138
19 Years	0	0	0	0	42

Variable	Not At All	Mild	Moderate	Severe	Extremely Severe
Total	2	10	10	180	209
Education					
Primary	2	10	10	8	0
Secondary	0	0	0	172	178
College	0	0	0	0	25
University	0	0	0	0	6
Total	2	10	10	180	209
Religion					
Christian	2	10	10	180	188
Muslim	0	0	0	0	21
Total	2	10	10	180	209
Parent					
With Parent(s)	2	10	10	180	188
Without Parent(s)	0	0	0	0	21
Total	2	10	10	180	209
Marital Status					
Married	0	0	0	0	13
Not Married	2	10	10	180	196
Total	2	10	10	180	209
Income					
Yes	2	10	4	0	0
No	0	0	6	180	209
Total	2	10	10	180	209

Variable	Not At All	Mild	Moderate	Severe	Extremely Severe
Pregnancy					
Planned	2	9	0	0	0
Unplanned	0	1	10	180	209
Total	2	10	10	180	209
Residence					
Rural	0	0	0	0	200
Urban	2	10	10	180	9
Total	2	10	10	180	209
Antenatal Care					
0-2 Times	2	10	10	89	0
3-4 Times	0	0	0	77	0
5-6 Times	0	0	0	14	158
7-8 Times	0	0	0	0	51
Total	2	10	10	180	209

The data in Table 4.6.1 highlights the significant variations in psychosocial effects of adolescent pregnancy across different sociodemographic factors. Severity of these effects was most pronounced among older adolescents, with all 18- and 19-year-olds reporting extreme severity. Adolescents with secondary education experienced the highest levels of severity, especially compared to those with higher educational attainment, while Christian respondents reported greater psychosocial distress, with all Muslim respondents also reporting extreme severity. Adolescents without parental support consistently experienced extreme severity, and unmarried adolescents were more impacted than their married peers. Financial dependence also played a crucial role, as those without income faced severe and extreme psychosocial effects, a trend echoed among those with unplanned pregnancies. Rural adolescents showed the highest rates of extreme severity compared to their urban counterparts, and adolescents who attended antenatal care (ANC) services more frequently experienced somewhat mitigated psychosocial

distress, suggesting that regular ANC visits may alleviate some of these effects. These findings emphasize the role of age, education, religion, parental support, marital status, income, pregnancy planning, residence, and ANC attendance in shaping the psychosocial outcomes for pregnant adolescents.

These findings underscore the importance of addressing sociodemographic factors—particularly age, education, marital status, income, pregnancy planning, and residence—in developing targeted interventions for pregnant adolescents. These demographic insights highlight areas of high psychosocial vulnerability, suggesting a need for enhanced support mechanisms, especially in rural areas and among adolescents with limited educational backgrounds and financial resources.

Table4.6.2 : Psychosocial Effects and Sociodemographic Factors

Sociodemographic Factor	Subgroup	Chi-square	p-value	Significance
Age	18-19 years	10.45	0.027**	Significant
Education Level	Secondary school or lower	8.76	0.032**	Significant
Marital Status	Unmarried	12.56	0.015**	Significant
Geographic Location	Rural	15.22	0.011**	Significant

In conclusion the study found statistically significant associations between age, education level, marital status, and geographic location with the severity of psychosocial effects of adolescent pregnancy. These findings highlight the importance of targeting interventions based on these sociodemographic factors to better support pregnant adolescents and address the psychosocial challenges they face.

4.7.2.2 Prevalence of Psychosocial Factors

The study investigated three key psycho social factors discrimination, anxiety, and feelings of isolation among pregnant adolescents, assessing their severity through frequencies and percentages. Each variable was measured using a 5-point Likert scale, as detailed in Table 4.7

Variable	Frequency	Percent
Discrimination		
Not At All	197	47.9%
Mild	2	0.5%
Moderately Severe	14	3.4%
Extremely Severe	198	48.2%
Total	411	100.0%
Anxiety		
Never	14	3.4%
Rarely	11	2.7%
Sometimes	31	7.5%
Often	129	31.4%
Always	226	55.0%
Total	411	100.0%
Isolation		
Strongly Disagree	20	4.9%
Disagree	10	2.4%
Neutral	35	8.5%
Agree	120	29.2%
Strongly Agree	226	55.0%
Total	411	100.0%

This table outlines the prevalence of psychosocial factors—discrimination, anxiety, and isolation—among the respondents, providing a breakdown of the frequency and percentage for each response category. The data reveals high levels of discrimination and anxiety, particularly

with 48.2% of respondents reporting extreme severity in discrimination, and a significant proportion (55.0%) experiencing anxiety "always." Additionally, feelings of isolation were strongly agreed upon by the majority (55.0%) of respondents.

Stigmatization and discrimination were notably prevalent among pregnant adolescents, with 48.2% experiencing extreme levels, while mild cases of stigmatization were reported by only 0.5% of respondents. Additionally, a significant proportion (55%) reported consistent feelings of anxiety, and an equal percentage agreed they often felt isolated. The respondents acknowledged that these feelings were of consequence, for maternal health service utilization, with one person sharing that "*Many adolescents experience psychosocial stressors during pregnancy, such as stigma, anxiety, and depression. Providing counseling, support groups, and referral services for mental health issues can improve overall well-being and pregnancy outcomes*."

4.7.2.3 Summary of Prevalence of psychosocial effects of Adolescent Pregnancy

The prevalence of psychosocial effects associated with adolescent pregnancy was assessed by tabulating frequencies and percentages across the operational variables. The study utilized a 5-point Likert scale to measure the extent of these effects, as detailed in Table 4.2.2.3

Table 4.8: Severity of Psychosocial effects of Adolescent Pregnancy

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Not At All	2	.5	.5	.5
Mild	10	2.4	2.4	2.9
Moderately	10	2.4	2.4	5.4
Severe	180	43.8	43.8	49.1
Extremely Severe	209	50.9	50.9	100.0
Total	411	100.0	100.0	

Overall, the study revealed a high prevalence of the psychosocial effects of adolescent pregnancy in Rongai Sub-County. Approximately 50.9% of adolescents experienced extremely severe psycho social effects, while 43.8% reported severe effects. Mild and moderately severe cases accounted for only 2.4% each, with negligible instances where no severity was reported, totaling 0.5%. These findings collectively underscore the significant and pervasive nature of psychosocial challenges faced by pregnant adolescents in Rongai Sub-County.

4.8 Association Between Psycho social factors and Maternal Utilization of antenatal Care Services Among Pregnant Adolescents in Rongai Sub-County

The third objective of this study aimed to examine the relationship between psychosocial factors—specifically feelings of stigmatization, anxiety, and isolation—and the utilization of antenatal care services among adolescents in Rongai Sub-County,Nakuru County.

4.8.1 Cross-Tabulation of the Association Between Psychosocial Effects of Adolescent Pregnancy and the Utilization of Antenatal Care (ANC) Services

Descriptive statistics were employed to summarize the data on the association between selected psychosocial effects of adolescent pregnancy and the utilization of antenatal care (ANC) services. This approach offers a clear and concise overview of the relationship between these variables. The findings from the cross-tabulation are presented in Table 4.9 below.

Table 4.9: Cross-tabulation of the association between psychosocial effects of adolescent pregnancy and the utilization of antenatal care (ANC) services

Variable	**Low Attendance (0-4 times)**	**High Attendance (5-8 times)**	**Total**
Perceived Social Support			
Agree	6	0	6
Neutral	7	0	7
Disagree	191	223	414
Total	204	223	427
Cultural Beliefs and Practice			
Agree	5	0	5
Neutral	6	0	6
Disagree	189	223	412
Total	200	223	423
Psychological Factors (Anxiety & Depression)			

Variable	Low Attendance (0-4 times)	High Attendance (5-8 times)	Total
Agree	3	0	3
Neutral	6	0	6
Disagree	191	223	414
Total	200	223	423
Previous Experience with Healthcare Services			
Agree	5	0	5
Neutral	4	0	4
Disagree	194	223	417
Total	203	223	426
Stigma & Discrimination			
Not at all	172	0	172
Mild	16	0	16
Severe	0	198	198
Total	188	198	386
Psychosocial Family Support			
Unimportant (Not, Somewhat, Moderately Important)	111	118	229
Important (Important, Very Important)	0	51	51
Total	111	169	280
Psychosocial Peer Influence			
Unimportant (Not, Somewhat, Moderately Important)	41	0	41
Important (Important, Very Important)	49	223	272

Variable	Low Attendance (0-4 times)	High Attendance (5-8 times)	Total
Total	90	223	313
Psychosocial Mental Health			
Unimportant (Not, Somewhat, Moderately Important)	71	0	71
Important (Important, Very Important)	40	200	240
Total	111	200	311
Psychosocial Stigma and Social Norms			
Unimportant (Not, Somewhat, Moderately Important)	51	0	51
Important (Important, Very Important)	77	197	274
Total	128	197	325

The results from the cross-tabulation, summarized in Table 4.6.1, indicate that psychosocial family support played a significant role, with those who considered it unimportant showing a nearly equal distribution between low (111) and high (118) attendance. Peer influence also emerged as a key factor, with 49 adolescents who viewed peer support as important attending ANC visits frequently (5-8 times). Regarding perceived social support, the majority of those who disagreed with having adequate support were more likely to attend ANC visits frequently, with 191 attending 0-4 times and 223 attending 5-8 times. Similarly, cultural beliefs and practices showed a parallel trend, with most respondents who disagreed with these beliefs attending ANC frequently, with 189 attending 0-4 times and 223 attending 5-8 times. Mental health support also played a crucial role, as 40 adolescents who valued mental health support attended ANC 5-8 times. Stigma and social norms were similarly influential, with 77 adolescents who regarded these factors as important attending ANC 5-8 times.

4.6.2 Chi-Square Analysis for Association between psychosocial factors and Maternal Utilization of Antenatal Care Services

A chi-square analysis was conducted to examine the relationship between psychosocial factors and the utilization of antenatal care (ANC) services among adolescent mothers. This statistical approach assessed the impact of these variables on ANC uptake, with significance determined based on chi-square p-values. The analysis helped evaluate the study hypothesis:

H03: There is no significant association between psychosocial factors and maternal utilization of antenatal care services among adolescents in Rongai Sub-County.

If the p-value of the chi-square test is below 0.05, indicating statistical significance, the null hypothesis—which assumes no meaningful association between psychosocial factors and ANC service utilization—is rejected. This threshold allows for a robust assessment of whether specific psychosocial factors significantly influence antenatal care attendance among the target population.

Table 4.10: Association Between Psychosocial Factors and Maternal Utilization of Antenatal Care Services

Psychosocial Factor	Statistic	Value	df	Asymp. Sig. (2-sided)
Stigmatization	Pearson Chi-Square	352.747	9	.000
	Likelihood Ratio	448.661	9	.000
	Linear-by-Linear Association	251.339	1	.000
	N of Valid Cases	411		
Feeling of Anxiety	Pearson Chi-Square	515.517	12	.000
	Likelihood Ratio	613.308	12	.000
	Linear-by-Linear Association	253.287	1	.000
	N of Valid Cases	411		
Feeling of Isolation	Pearson Chi-Square	544.299	12	.000
	Likelihood Ratio	629.570	12	.000
	Linear-by-Linear Association	256.148	1	.000
	N of Valid Cases	411		

The table presents the chi-square analysis results for the association between various psychosocial factors—such as stigmatization, anxiety, and isolation—and the utilization of antenatal care (ANC) services among adolescent mothers. The Pearson Chi-Square, Likelihood Ratio, and Linear-by-Linear Association values for each factor show high significance ($p < 0.001$), indicating a strong association between these psychosocial factors and ANC service utilization. The findings suggest that stigmatization, anxiety, and feelings of isolation significantly impact the frequency of ANC attendance among adolescent mothers in the study.

The model summary indicates that psychosocial factors significantly influence antenatal care (ANC) uptake among pregnant adolescents in Rongai Sub-County. For stigmatization, the Pearson Chi-Square statistic was 352.747 with 9 degrees of freedom ($p < .001$), showing a strong, highly significant association with ANC attendance. This finding is supported by the

likelihood ratio (448.661) and the linear-by-linear association (251.339), both with p-values below .001, underscoring the crucial impact of stigmatization on ANC behaviors.

Anxiety similarly showed a significant relationship with ANC attendance. The Pearson Chi-Square value was 515.517 with 12 degrees of freedom ($p < .001$), and the high likelihood ratio (613.308) and strong linear-by-linear association (253.287) further confirm that heightened anxiety strongly influences ANC service utilization.

Feelings of isolation also demonstrated a significant association with ANC attendance, as indicated by a Pearson Chi-Square value of 544.299 with 12 degrees of freedom ($p < .001$). This was reinforced by the likelihood ratio (629.570) and the linear-by-linear association (256.148), suggesting that isolation significantly impacts attendance behavior, as shown in Table 4.6.2. These findings underscore the substantial role of psychosocial factors—stigmatization, anxiety, and isolation—in shaping ANC uptake among adolescent mothers in this region.

4.11 Perceived Barriers to Maternal Utilization of Antenatal Care Services by Adolescents

The study's final objective investigated the barriers to utilization of antenatal care services by pregnant adolescents in Rongai Sub-County. The investigation identified five primary barriers: transportation, cost of medication, stigma, healthcare provider attitudes, and lack of knowledge about ANC availability. Each of these barriers was assessed using a 5-point Likert scale to capture varying degrees of impact on ANC service uptake.

To analyze these perceived barriers, the study employed descriptive statistics and chi-square tests, aiming to test the null hypothesis (Ho4) that there are no significant perceived barriers to ANC utilization by pregnant adolescents in Rongai Sub-County. This approach allowed the research to determine the extent to which each factor might discourage or inhibit ANC attendance, providing valuable insights into specific challenges faced by this demographic in accessing essential maternal healthcare.

4.9.1 Descriptive Statistics for Perceived Barriers to Maternal Utilization of Antenatal Care Services by Adolescents

Descriptive analysis was conducted to examine the mean values, standard deviation, variance, and skewness of perceived barriers affecting the utilization of antenatal care (ANC) services

among mothers. Understanding these statistics is essential for assessing the distribution and variability of barriers perceived by mothers in accessing ANC services. Table 4.7.1 presents the descriptive statistics for perceived barriers.

Table 4.12: Descriptive Statistics for Perceived Barriers to Maternal Utilization of Antenatal Care Services by Adolescents

	N Valid	Mean	Std. Deviation	Variance	Skewness	Std. Error of Skewness
Transport barriers	411	2.6423	1.23013	1.513	1.269	0.12
Cost of services	411	2.6156	1.18245	1.398	1.35	0.12
Stigma barriers	411	2.326	0.84147	0.708	2.138	0.12
Provider attitude	411	2.562	1.08557	1.178	1.42	0.12
Lack of knowledge	411	2.5766	1.11785	1.25	1.312	0.12

The mean values of the variables ranged from 2.3 to 2.7, indicating a moderate level on the 5-point Likert scale used for measurement. Additionally, the data exhibited positive skewness, suggesting that a logarithmic transformation may be appropriate for subsequent analyses.

4.7.2 Cross-Tabulation Analysis for Perceived Barriers to Maternal Utilization of Antenatal Care Services by Adolescents

Descriptive statistics were employed to summarize data on the association between selected Perceived Barriers to Maternal Utilization of Antenatal Care Services by Adolescents. This was deemed essential to providing, at a glance a quick overview of the relationship between these variables. The findings of the crosstabulation are presented in table 4.13 below

Table 4.13: Cross-Tabulation of Perceived Barriers and ANC Attendance Frequency

Barrier	ANC Visits (0-4 times)	ANC Visits (5-8 times)	Total
Transportation			
Low (Not Important, Neutral)	10	11	21
Moderate (Barrier)	101	121	222
High (Facilitator, Strong Facilitator)	0	81	81
Total	111	213	324
Cost of Services			
Low (Not Important, Neutral)	6	5	11
Moderate (Barrier)	105	126	231
High (Facilitator, Strong Facilitator)	0	70	70
Total	111	201	312
Stigma			
Low (Not Important)	4	0	4
Moderate (Barrier)	107	163	270
High (Facilitator, Strong Facilitator)	0	51	51
Total	111	214	325
Frequency of Lack of Transport			
Low (Rarely, Sometimes)	31	0	31
High (Often, Always)	157	223	380
Total	188	223	411
Frequency of Inability to Afford Services			
Low (Rarely, Sometimes)	30	0	30
High (Often, Always)	158	223	381
Total	188	223	411
Frequency of Fear of Stigma			

Barrier	ANC Visits (0-4 times)	ANC Visits (5-8 times)	Total
Low (Rarely, Sometimes)	7	0	7
High (Often, Always)	181	223	404
Total	188	223	411

Table 4.13 provides insights into how various perceived barriers impact antenatal care (ANC) attendance among adolescents in Rongai Sub-County.For adolescents who identified transportation as a moderate barrier, 101 attended ANC services 0-4 times, while 121 managed to attend 5-8 times. Cost of services presented a similar trend, with 105 adolescents in the moderate barrier group attending 0-4 times and 126 attending 5-8 times. Stigma was also a considerable barrier; among adolescents viewing stigma as moderate, 107 attended ANC 0-4 times, compared to 163 who attended 5-8 times.

For those experiencing frequent lack of transportation, attendance remained high: 157 adolescents attended 0-4 times, and 223 attended 5-8 times, suggesting that transportation issues did not entirely hinder attendance. Similarly, frequent cost barriers were present for 158 adolescents.

4.9.3 Chi-Square Analysis of Perceived Barriers to Maternal Utilization of Antenatal Care Services by Adolescents

Chi-Square analysis was employed to assess the perceived barriers to maternal utilization of antenatal care (ANC) services among adolescents. This method utilizes the Chi-Square value alongside the associated p-values to draw conclusions from the data. The null hypothesis is rejected when the p-value is less than the critical threshold of 0.05. In this analysis, all obtained p-values were 0.000, indicating statistical significance and allowing for the rejection of the null hypothesis.

Chi-Square tests were conducted for each predictor variable in relation to the dependent variable. A Chi-Square value exceeding the expected value at the respective degrees of freedom signifies a relationship between the variables that is unlikely to occur by chance. The detailed Chi-Square values for the perceived barriers to maternal utilization of ANC services are presented in Table 4.7.3.

Table 4.14: Chi-Square Analysis for Perceived Barriers to Maternal Utilization of Antenatal Care Services by Adolescents

Variable	Chi-Square Value	Asymp. Sig. (2-sided)	Cramér's V	Approx. Sig.
Transport	310.711	.000	0.869	.000
Cost of Services	345.959	.000	0.917	.000
Stigma Factors	358.763	.000	0.934	.000
Provider Attitude	450.182	.000	1.047	.000
Lack of Knowledge	496.230	.000	1.099	.000

This table presents the results of the Chi-Square analysis, highlighting significant perceived barriers to the utilization of antenatal care (ANC) services among adolescents. Each variable demonstrates a Chi-Square value significantly above the critical threshold, with p-values of .000, indicating strong statistical significance. The Cramér's V values suggest very strong associations between each barrier and ANC utilization, underscoring critical factors influencing access to care.

The analysis revealed significant relationships across all variables. For transport, the Chi-Square value was 182.804 with a p-value less than .001, indicating a robust association with ANC attendance. One respondent noted, *"Living in a rural area, the clinic was quite far from my home, and public transportation options were limited. This made it difficult for me to attend regular antenatal care appointments, especially during late pregnancy when mobility was reduced."*

Similarly, the cost of services had a significant impact, with a Chi-Square value of 178.944 ($p < .001$) and a Cramér's V of 0.917, reflecting a very strong association. A respondent expressed, *"As a pregnant woman from a low-income background, I struggled to afford the cost of medical services, transportation to the clinic, and essential medications prescribed by healthcare providers."* This finding aligns with other studies conducted in Sub-Saharan Africa, which, despite ongoing efforts to improve maternal health, still reveal discrepancies, particularly in rural areas.

Stigma factors also significantly affected ANC attendance, with a Chi-Square value of 358.763 ($p < .001$) and a Cramér's V of 0.934, indicating a strong relationship. Provider attitudes emerged as another critical barrier, with a Chi-Square value of 188.005 ($p < .001$) and a high Cramér's V of 1.047. However, many respondents reported positive experiences with healthcare providers that encouraged them to maintain consistent ANC visits. For instance, one respondent shared, *"My midwife at the local clinic has always been empathetic and attentive during my antenatal appointments. She takes the time to listen to my concerns, provides*

thorough explanations about my pregnancy progress, and offers practical advice on staying healthy."

Closely linked to provider attitudes was the lack of knowledge, which showed the strongest association with ANC attendance. The Chi-Square value for this variable was 496.230 ($p < .001$) with a Cramér's V of 1.099. Even respondents with limited maternal health knowledge reported gaining valuable information when healthcare providers were supportive. One respondent mentioned, *"I initially didn't have much information, but I appreciated the holistic approach of the healthcare team, which included providing education about nutrition, exercise, and childbirth preparation."*

These insights highlight the multifaceted barriers faced by pregnant adolescents in accessing ANC services, emphasizing the need for targeted interventions to address these challenges and improve maternal health outcomes.

4.10 Regression Analysis of Demographic, Psychosocial Factors, and Perceived Barriers Against Maternal Utilization of Antenatal Care Services by Adolescents

To further evaluate the weighted contribution of independent variables to the utilization of antenatal care (ANC) services by adolescents, a regression analysis was conducted. This analysis examined the relationships between selected predictors, including age, parental status, gestation stage, psychosocial factors, and perceived barriers, and ANC attendance. The aim was to determine the extent to which these variables influence the frequency of ANC visits while accounting for the contribution of each factor.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics
	.947a	.897	.896	.32720	R Square Change: .897 F Change: 707.984 df1: 5

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.338	.154		2.196	
AGE	.592	.033	.674	18.103	
Parent Status	-.089	.083	-.019	-1.084	
Gestation Stage	.562	.052	.400	10.792	
Psychosocial Factors	-.198	.079	-.051	-2.499	
Perceived Barriers	-.205	.058	-.086	-3.552	

Dependent Variable: Ante Natal Care

The results from the regression analysis indicated that the model is highly predictive, with an R value of .947, signifying a very strong correlation between the predictors (age, parental status, gestation stage, psychosocial factors, and perceived barriers) and ANC attendance. The R^2 value of .897 suggests that approximately 89.7% of the variance in ANC attendance can be explained by these predictors, while the adjusted R^2 of .896 confirms this strong explanatory power after accounting for the number of predictors in the model. The F-statistic of 707.984 is significant ($p < .001$), indicating that the model as a whole is highly significant.

Among the individual predictors, age emerged as a strong positive predictor of ANC attendance, with a significant coefficient of .592 ($p < .001$), suggesting that for every one-unit increase in age, ANC attendance increases by .592 units. Gestation stage also exhibited a strong

positive effect, with a coefficient of .562 ($p < .001$), indicating that women in later stages of pregnancy are more likely to attend ANC.

Conversely, parental status had a non-significant negative coefficient of -.089 ($p = .279$), suggesting no significant effect on ANC attendance. This may be attributed to the study population, where many respondents were experiencing their first pregnancy, limiting the applicability of past pregnancy experiences on current utilization of maternal services.

Psychosocial factors and perceived barriers demonstrated negative impacts on ANC attendance, with coefficients of -.198 ($p = .013$) and -.205 ($p < .001$), respectively. When psychosocial factors create a supportive environment, respondents reported attending more ANC visits. For example, one respondent shared, *"Having loved ones who encourage me to prioritize my health, accompany me to appointments, and provide emotional support makes accessing healthcare services more manageable and less intimidating."* Additionally, financial accessibility was noted as a facilitator: *"When the cost of medical care is manageable, it reduces financial barriers and encourages me to seek antenatal care regularly."*

The regression findings can be summarized with the following regression equation:

Antenatal Care Attendance = 0.338 + 0.592(Age) - 0.089(Parent Status) + 0.562(Gestation Stage) - 0.198(Psychosocial Factors) - 0.205(Perceived Barriers)

The intercept of 0.338 signifies the baseline ANC attendance when all predictors are at zero, emphasizing the importance of addressing these variables to enhance ANC utilization among adolescents.

4.10.1 Summary of Hypothesis Tests: Maternal Utilization of Antenatal Care Services Among Adolescents in Rongai Sub-County

This table 4.26 summarizes the findings from various hypothesis tests conducted to explore factors influencing maternal utilization of antenatal care (ANC) services among adolescents in Rongai Sub-County.

Table 4.16: Summary of Hypothesis Tests

Objective	Hypothesis	Method	Statistic	Decision
To establish the association between sociodemographic factors and maternal utilization of antenatal care services in Rongai Sub-County	There is no significant association between sociodemographic factors and maternal utilization of antenatal care services in Rongai Sub-County	ANOVA Chi-Square analysis, Regression analysis	$p<0.05$ $F>2.5$ $p < 0.05$	Hypothesis rejected
To determine the severity of psychosocial effects among pregnant adolescents in Rongai Sub-County	There are no severe psychosocial effects of adolescent pregnancy in Rongai Sub-County	Descriptive statistics, percentages, and frequencies	50.9% of cases reported extremely severe psychosocial effects	Hypothesis rejected
To establish the association between psychosocial factors and maternal utilization of antenatal care services among adolescents in Rongai Sub-County	There is no significant relationship between psychosocial factors and maternal utilization of antenatal care services among adolescents in Rongai Sub-County	Chi-Square	$p < 0.05$	Hypothesis rejected
To investigate the barriers to utilization of antenatal care services by pregnant adolescents in Rongai Sub-County	There are no perceived barriers to utilization of antenatal care services by pregnant adolescents in Rongai Sub-County	Chi-Square analysis, Regression analysis	$p < 0.05$	Hypothesis rejected

This table summarizes the results of the hypothesis tests conducted in the study, indicating that all null hypotheses were rejected, highlighting significant findings in each objective area.

4.11 Conclusion

This chapter presented the analysis of data collected and discussion of the findings. The chapter focused on analyzing the data pertaining to the psycho-social effects of adolescent pregnancy on maternal utilization of antenatal care services among adolescents in Rongai Sub-County. The chapter chapter presents a combination of descriptive analysis, cross tabulation, chi-square analysis, and regression analysis to investigate the relationships between sociodemographic factors, psycho-social factors, perceived barriers, and maternal healthcare utilization.

CHAPTER FIVE

DISCUSSIONS OF THE FINDINGS

5.1 Introduction

This chapter provides an in-depth analysis and interpretation of the research findings obtained from the cross-sectional survey conducted in Rongai Sub County, Nakuru County, Kenya. The study aimed to investigate the determinants of psychosocial effects of adolescent pregnancy on maternal services utilization. Drawing on existing literature and findings from related studies, this chapter discusses the implications of the research results, explores how they align with or diverge from previous studies, and offers insights into the practical and theoretical aspects of the study

5.2 Association Between Sociodemographic Factors and Maternal Utilization of Antenatal Care Services

5.2.1 Overview of Findings

The first objective of this study focused on the relationship between various sociodemographic factors and the utilization of antenatal care (ANC) services among pregnant adolescents in Rongai Sub-County, Nakuru. The study's findings illuminate significant associations and provide insights into how these factors influence ANC utilization. Here, the researcher discuss these findings in relation to current literature and identify how they align with or diverge from previous research.

5.2.2 Age

The analysis reveals a strong association between age and ANC utilization ($F = 798.257$, $p < 0.001$). Younger adolescents frequently face barriers such as limited access to information and healthcare services, which impedes their ability to attend ANC appointments (Lumpkin & Valente, 2023). This is consistent with earlier studies, which have found that younger maternal age is linked to lower utilization of maternal health services (Titaley et al., 2010; Singh et al., 2012). These findings underscore the need for targeted interventions to address the unique

challenges faced by younger pregnant adolescents, including enhanced educational outreach and accessible healthcare services.

5.2.3 Education

Educational attainment significantly predicts ANC utilization ($F = 66.115$, $p < 0.001$). Adolescents with higher educational levels are more likely to recognize the importance of ANC and have better access to healthcare resources (Khan et al., 2022). This finding aligns with the literature indicating that education empowers individuals to seek and utilize healthcare services more effectively (Simkhada et al., 2008). Therefore, improving educational opportunities and health literacy among adolescents may enhance ANC utilization and overall maternal health outcomes.

5.2.4 Religion

Religion was found to significantly influence ANC utilization ($F = 63.675$, $p < 0.001$). Religious beliefs can shape health-seeking behaviors and the support structures available to pregnant adolescents. For instance, Christian norms may offer more robust support systems compared to other religious backgrounds (Ahmed et al., 2022). This finding is supported by research suggesting that religious communities play a role in health service utilization through community norms and support systems (Gage, 2007). Understanding these religious influences can help tailor interventions to align with cultural and religious contexts, potentially improving ANC uptake.

5.2.5 Parental Status

The study highlights a strong association between parental status and ANC utilization ($F = 63.675$, $p < 0.001$). Adolescents who live with their parents are more likely to receive the necessary support for healthcare needs (Miller et al., 2021). This is consistent with existing literature that emphasizes the importance of parental support in facilitating healthcare access and utilization among adolescents (Smith et al., 2020). Enhancing support mechanisms for adolescents lacking parental support could be crucial for improving ANC utilization.

5.2.6 Marital Status

Marital status significantly influences ANC utilization ($F = 36.396$, $p < 0.001$). Married adolescents generally experience more stability and support, leading to higher ANC utilization rates (Kumar et al., 2021). This result corroborates previous studies indicating that marital status impacts healthcare access due to varying levels of support and social networks (Doku et al., 2019). Tailoring interventions to address the specific needs of unmarried adolescents may help improve their healthcare access and outcomes.

5.2.7 Pregnancy Status

The study finds a significant relationship between planned versus unplanned pregnancies and ANC utilization ($F = 22.524$, $p < 0.001$). Unplanned pregnancies often lead to lower levels of prenatal care due to initial shock and lack of preparedness (Harrison & Pate, 2023). This supports existing literature showing that planned pregnancies are associated with better healthcare outcomes and higher ANC utilization (Ahmed et al., 2022). Providing support and counseling for adolescents experiencing unplanned pregnancies could enhance their engagement with ANC services.

5.2.8 Residence

The association between residence (urban vs. rural) and antenatal care (ANC) utilization was highly significant ($F = 867.803$, $p < 0.001$). Urban residents typically have better access to healthcare facilities compared to their rural counterparts, as highlighted by Khan et al. (2022). This finding aligns with previous research that underscores the disparities in healthcare access between urban and rural areas (Gage, 2007).

Improving healthcare infrastructure and implementing targeted outreach programs in rural communities are essential steps to bridge this gap in ANC utilization. Studies by Johnson et al. (2023) further emphasize the importance of enhancing transportation options and community-based health services to increase access for rural pregnant adolescents. By addressing these disparities, we can promote better health outcomes and ensure that all adolescents receive the essential antenatal care they need.

5.2.9 Gestation

The relationship between gestation period and ANC utilization was significant ($F = 842.200$, $p < 0.001$). Adolescents who start ANC early in their pregnancy are more likely to attend regular

visits (Smith et al., 2020). This aligns with studies emphasizing that timely initiation of ANC is crucial for optimal maternal and fetal health outcomes (Doku et al., 2019). Ensuring that adolescents are informed about the importance of early ANC initiation and providing accessible services can improve overall prenatal care.

5.2.9 Conclusion

The findings from this study underscore the complex interplay between sociodemographic factors and the utilization of ANC services among pregnant adolescents. Age, education, religion, parental status, marital status, pregnancy status, residence, and gestation period all play significant roles in shaping ANC utilization patterns. These insights align with and extend previous research, highlighting the need for targeted interventions that address the specific challenges faced by different groups of adolescents. By understanding and addressing these factors, stakeholders can better support pregnant adolescents and improve maternal health outcomes in Rongai Sub-County and beyond.

5.2 The Prevalence and Severity of Psychosocial Effects of Adolescent Pregnancy

5.2.1 Overview of Findings

The second objective of this study focused on evaluating the prevalence and severity of psychosocial effects experienced by pregnant adolescents in Rongai Sub-County. The assessment, using a 5-point Likert scale, uncovered a considerable prevalence of severe psychosocial challenges among the participants.

The findings of this study align with prior research, as they emphasize the substantial psychological and emotional burdens faced by pregnant adolescents, which previous studies have also highlighted. For example, only 0.5% of respondents in this study reported no severe psychosocial effects, while a combined 94.7% reported either severe or extremely severe effects. This resonates with Ahmed and Hasan's (2023) study, which revealed elevated levels of anxiety and depression among young mothers due to factors such as societal stigma and insufficient support. Such parallels suggest that the psychosocial challenges are not unique to the study region but may be widespread, largely influenced by similar cultural, social, and developmental pressures that adolescents face during pregnancy.

Additionally, Wong et al. (2022) noted that adolescents' transition to motherhood often entails significant emotional challenges, especially given their young age and typical lack of preparation for parenting. The similar findings in this study indicate that these effects are

consistently observed across different contexts, underscoring the universality of psychosocial challenges for this demographic. Such alignment suggests a broader pattern that necessitates interventions focused on mental health support and destigmatization efforts, tailored to the specific needs of adolescent mothers across diverse settings.

5.2.1.2 Severity Across Sociodemographic Factors

The study identified significant variations in the severity of psychosocial effects based on sociodemographic factors such as age, education, religion, parental status, marital status, income, pregnancy status, residence, and frequency of antenatal care visits.

5.2.2 Severity of Psychosocial Effects and Sociodemographic Factors

5.2.2.1 Age and Education

The alignment of this study's findings with previous research regarding age and education can be attributed to shared social, developmental, and structural factors that similarly affect adolescents across different settings.

Firstly, the finding that older adolescents (age 18) report more severe psychosocial effects is consistent with Nove et al. (2023), who suggest that as adolescents age, they often experience heightened stress due to growing societal expectations and perceived responsibilities. Older adolescents are often more aware of societal stigmas, future concerns, and the broader implications of early pregnancy, which can contribute to elevated stress and psychological pressures. These age-related stressors are likely universal, as they relate to developmental milestones and the increasing self-awareness typical of late adolescence, explaining why similar trends appear across different studies and contexts.

Additionally, adolescents with only a secondary education often have fewer resources and coping mechanisms to manage the complexities of pregnancy, as highlighted by Gibson and McCabe (2023). Limited educational attainment can restrict access to information, support networks, and problem-solving skills, making it challenging for these

5.2.2.2 Religion

The study found out that christian adolescents reported experiencing more severe psycho-social effects compared to their Muslim counterparts. This variation may arise from differing

cultural and community responses to adolescent pregnancy within various religious contexts (Smith et al., 2023).

The alignment between this study and previous research on the role of religion in psychosocial effects during adolescent pregnancy can be attributed to both cultural and structural factors inherent in different religious communities.

The finding that Christian adolescents reported more severe psychosocial effects compared to their Muslim peers may stem from varying levels of stigmatization and social support across religious communities. As Smith et al. (2023) point out, religious contexts shape community attitudes toward adolescent pregnancy, potentially influencing the degree of stigma or acceptance. In some Christian communities, the cultural response to adolescent pregnancy may involve stricter moral judgments, heightening feelings of guilt or isolation. Conversely, some Muslim communities may have specific support networks or cultural structures that provide pregnant adolescents with greater familial and social backing, which can mitigate negative psychological impacts.

This study aligns with Jones and Bevan (2024), who found that religious norms and values around pregnancy differ significantly, affecting adolescents' experiences of support or isolation. Patel et al. (2022) also noted that structured community support within certain religious contexts helps to buffer the psychosocial effects of adolescent pregnancy, offering emotional resources and practical assistance that reduce stigma's impact. Such findings underline the importance of cultural sensitivity in developing support programs tailored to diverse religious backgrounds, as this can help foster better mental health outcomes and create a more inclusive environment for adolescent mothers.

5.2.2.3 Parental Status

This study's findings on parental support and marital status align closely with prior research, underscoring the critical role of family and social support in reducing psychosocial distress among pregnant adolescents.

Adolescents living with their parents reported fewer severe psychosocial effects, consistent with findings by Lee et al. (2023), which highlight family support as a significant protective factor. Parents often provide not only emotional support but also practical assistance, which helps to alleviate the psychological burden of pregnancy. This support reduces feelings of isolation and contributes to a stable environment, allowing adolescents to cope more effectively with stressors.

The study also observed that unmarried pregnant adolescents experienced higher levels of severe psychosocial effects than their married counterparts, a result that aligns with research

by Wong et al. (2023) and Martinez et al. (2022). Unmarried adolescents often face heightened social stigma and limited social support, leading to increased psychological distress. Without the social acceptance or security that marriage may provide, unmarried adolescents may encounter isolation and judgment from their communities, which can intensify feelings of anxiety and depression.

This pattern is further corroborated by Thompson and Nguyen (2023), who emphasize the importance of strong social support networks in mitigating psychosocial challenges among pregnant adolescents. The findings suggest that effective interventions and community programs targeted at unmarried and unsupported adolescents could play a pivotal role in improving their mental health and fostering resilience. Tailored support systems that consider these unique vulnerabilities are essential for promoting the well-being of these adolescents.

5.2.2.5 Income and Pregnancy Status

The study's findings on income and pregnancy status align well with previous research, showing that adolescents facing financial instability and unplanned pregnancies report heightened levels of severe psychosocial effects. This similarity reflects the common challenges associated with economic insecurity and unexpected pregnancy, both of which contribute to a substantial psychological burden.

Adolescents without financial support often encounter additional stress due to limited resources, as Anderson et al. (2023) describe. Financial insecurity creates uncertainty about future stability, amplifying anxieties around healthcare access, childcare, and other essential needs. This lack of resources can also hinder adolescents' ability to secure mental health support, thereby compounding stress and emotional strain.

Additionally, unplanned pregnancies bring a unique set of challenges, often exacerbating social isolation and anxiety. Brown et al. (2022) underscore that economic hardships can significantly intensify feelings of isolation and depression among young mothers, as limited financial resources often restrict their access to healthcare and support networks. Smith and Lee (2023) further highlight that financial stress can isolate young mothers from social and family support, which is crucial for their psychological resilience.

These findings suggest that comprehensive support systems, including financial aid and accessible healthcare, are essential to reduce the mental health challenges faced by pregnant adolescents, particularly those without financial or social support. Tailored assistance programs can provide vital stability and alleviate the compounded psychosocial effects associated with economic hardship and unplanned pregnancies.

5.2.2.6 Residence

The study's findings on residence align with existing research, revealing that rural adolescents experience more severe psychosocial effects than their urban counterparts. This similarity underscores the impact of geographic and resource disparities on mental health outcomes. Rural areas often lack accessible healthcare and support services, creating a barrier to necessary care and assistance, as noted by Osei and Tetteh (2024). This limited access leads to increased stress and anxiety, with rural adolescents facing greater challenges in navigating pregnancy-related pressures.

Supporting studies by Johnson et al. (2023) and Patel et al. (2022) echo these findings, highlighting that rural young mothers face logistical obstacles and social isolation that hinder their ability to seek timely healthcare and emotional support. These constraints often leave rural adolescents without the resources needed to manage the psychological demands of pregnancy, further amplifying their stress.

Addressing these issues through tailored interventions, such as mobile healthcare services, improved transportation, and community-based support networks, can help mitigate the heightened psychosocial effects among rural adolescents. Allocating resources to address these gaps is crucial for promoting equitable mental health and healthcare access for pregnant adolescents in rural communities.

5.2.2.7 Antenatal Care Frequency

The study found out that adolescents who attended fewer antenatal care visits reported experiencing more severe psycho-social effects. This finding highlights the importance of regular antenatal visits, which are often linked to improved psychological support and a reduction in psycho-social challenges.This study is congruent with research by Baker et al. (2023) who supports this notion, suggesting that enhancing access to and utilization of antenatal care could alleviate some of the psycho-social issues faced by pregnant adolescents.

Moreover, studies by Thompson et al. (2022) and Nguyen et al. (2023) reinforce the idea that consistent engagement with healthcare services not only fosters better maternal health outcomes but also provides essential emotional and social support, which is crucial for mitigating anxiety, isolation, and stigma. Therefore, improving access to ANC services could play a vital role in enhancing the overall well-being of pregnant adolescents.

5.2.3 Severity of Psychosocial Factors

5.2.3.1Discrimination

The study revealed that 198(48.2%) of respondents experienced extreme discrimination and stigmatization, underscoring the profound societal stigma associated with adolescent pregnancy. This finding aligns with research by Ahmed & Hasan (2023), which highlights the significant impact of stigma in exacerbating feelings of isolation and anxiety among young mothers. Such discrimination not only adds to emotional distress but also creates critical barriers to accessing healthcare services.

Further support comes from studies by Lee et al. (2023) and Smith et al. (2023), which show that stigma negatively affects health-seeking behaviors and contributes to ongoing mental health challenges for adolescent mothers. Recognizing the prevalence and consequences of stigma highlights the importance of interventions focused on fostering acceptance and support. Reducing societal discrimination is essential for improving the mental well-being and healthcare access of pregnant adolescents.

5.2.3.2Anxiety

The study found that 55% of respondents reported experiencing consistent anxiety, which aligns with existing literature. Research by Brown & Evans (2024) indicates that adolescent pregnancy is often linked to heightened anxiety, driven by a range of social, economic, and personal uncertainties. These uncertainties may include concerns about future opportunities, financial stability, and societal judgment, all of which contribute to the increased psychological stress experienced by pregnant adolescents. Understanding the factors that fuel anxiety in this population is crucial for developing targeted interventions aimed at reducing anxiety and supporting the mental health of adolescent mothers.

5.2.3.3 Isolation

The study found that 55% of participants reported frequent feelings of isolation, a finding consistent with existing research. Lee et al. (2023) note that pregnant adolescents often experience isolation due to social stigma and a lack of adequate support networks. This sense of isolation not only exacerbates the psychosocial challenges faced by these adolescents but also hinders their ability to seek and receive the necessary support, both emotionally and practically. The compounded effects of isolation can increase the risk of mental health issues and impact the adolescent's overall well-being. Addressing these feelings through strengthened social support networks and community-based interventions is crucial to improving the mental health outcomes of pregnant adolescents.

5.2.3.4 Conclusion

The findings of this study highlight the profound and multifaceted psychosocial effects experienced by pregnant adolescents in Rongai Sub-County. The severe impacts of discrimination, anxiety, and isolation are influenced by various sociodemographic factors, including age, education, religion, parental status, marital status, income, pregnancy status, residence, and antenatal care frequency. Addressing these challenges requires a multifaceted approach that includes enhancing family support, improving access to resources, and reducing stigma through community education and supportive interventions.

5.3 Association Between Psychosocial Factors and Maternal Utilization of Antenatal Care Services

5.3.1 Overview of Findings

The third objective of the study focused on examining the relationship between psychosocial factors—specifically stigmatization, anxiety, and isolation—and the utilization of antenatal care (ANC) services among pregnant adolescents in Rongai Sub-County. Chi-square analysis was employed to assess these associations, revealing significant p-values that underscore a strong relationship between psychosocial factors and ANC uptake.

The findings demonstrated that each psychosocial factor significantly influenced ANC utilization, with all p-values falling below 0.05. This is consistent with previous studies, such as those by Lee et al. (2023) and Brown and Evans (2024), which have highlighted the critical role of psychosocial dynamics in healthcare-seeking behaviors among adolescents. The

significant associations identified in this study suggest that addressing these psychosocial barriers is essential for improving ANC attendance and overall maternal health outcomes. Targeted interventions aimed at reducing stigma, alleviating anxiety, and fostering social support can help enhance the utilization of antenatal care services among this vulnerable population.

5.3.2Stigmatization

The analysis revealed a high Pearson Chi-Square value of 352.747 with a p-value of 0.000, indicating a significant relationship between stigmatization and antenatal care (ANC) uptake. Pregnant adolescents who experienced higher levels of stigmatization were less likely to seek regular ANC services. These findings corroborate previous research highlighting the profound impact of stigma on health-seeking behaviors among adolescents.

For instance, Ahmed and Hasan (2023) found that stigma associated with adolescent pregnancy significantly deters young mothers from seeking essential healthcare services, including ANC. Furthermore, the high levels of stigmatization reported in Rongai Sub-County reflect trends observed in other regions, where social stigma poses substantial barriers to accessing healthcare (Smith et al., 2023). Addressing these stigma-related issues is crucial for improving ANC utilization and fostering a more supportive environment for pregnant adolescents. Interventions aimed at reducing stigma and promoting acceptance can help facilitate better healthcare access and improve maternal health outcomes.

5.3.3 Anxiety

Anxiety was found to be significantly associated with antenatal care (ANC) utilization, with a Pearson Chi-Square value of 515.517 ($p < 0.05$). Higher levels of anxiety among adolescents correlated with lower utilization of ANC services. This significant association aligns with findings from Brown and Evans (2024), which indicated that anxiety can hinder adolescents' ability to access and adhere to antenatal care recommendations.

Anxiety often leads to avoidance behaviors and reluctance to engage with healthcare services, a trend also observed in the study conducted in Rongai Sub-County. Similar conclusions were drawn by Martinez et al. (2023), who emphasized that heightened anxiety levels negatively impact healthcare-seeking behaviors among pregnant adolescents. Addressing anxiety through

supportive interventions, such as counseling and mental health resources, is essential for improving ANC attendance and ensuring better maternal health outcomes.

5.3.4 Isolation

The findings revealed a significant relationship between feelings of isolation and antenatal care (ANC) utilization, with a Pearson Chi-Square value of 544.299 ($p < 0.05$). Adolescents experiencing feelings of isolation were less likely to engage in regular ANC visits. This relationship is consistent with research by Lee et al. (2023), which demonstrated that isolation can exacerbate challenges in accessing and utilizing health services.

Pregnant adolescents who feel isolated often lack the emotional and social support necessary to effectively navigate healthcare systems. This underscores the importance of fostering supportive environments that can mitigate feelings of isolation, thereby promoting greater engagement with ANC services. Further studies, such as those by Thompson et al. (2022), have also shown that enhancing social support networks can lead to improved healthcare utilization among adolescents. Addressing feelings of isolation is therefore crucial for improving maternal health outcomes and ensuring that young mothers receive the care they need during pregnancy.

5.4 Perceived Barriers to Maternal Utilization of Antenatal Care Services

The fourth objective of this study aimed to identify and evaluate the perceived barriers to antenatal care (ANC) utilization among pregnant adolescents in Rongai Sub-County. The barriers investigated included transport issues, cost of services, stigma, provider attitudes, and lack of knowledge about the availability of ANC services. Through descriptive statistics and chi-square analyses, the study assessed the impact of these barriers on ANC utilization.

5.4.1 Descriptive Statistics Overview

The descriptive analysis indicated that the mean scores for all perceived barriers ranged from 2.3 to 2.7 on a 5-point Likert scale, reflecting a moderate level of concern across all variables. The positive skewness in the data suggests that, while barriers do exist, they are not uniformly experienced at extreme levels by all respondents. This variability in perceived barriers underscores the need for targeted interventions to address specific challenges faced by different subgroups of pregnant adolescents.

Consistent with this finding, Thapa et al. (2023) observed similar moderate levels of concern regarding barriers to healthcare access among young mothers, underscoring the diverse experiences of adolescents during pregnancy. These barriers often manifest in various forms, including financial constraints, lack of transportation, and societal stigma, all of which contribute to limited access to healthcare services. Additionally, Kumar et al. (2022) emphasized the importance of tailoring interventions to meet the specific needs of distinct adolescent groups, reinforcing the idea that standardized approaches may not be effective in addressing the unique challenges faced by different subgroups. By acknowledging and addressing these varied perceptions of barriers, healthcare providers can devise more targeted and efficient strategies to improve access to antenatal care services for pregnant adolescents, thereby enhancing their overall health outcomes

5.4.2 Chi-Square Analysis and Statistical Significance

The chi-square analysis revealed statistically significant relationships between all perceived barriers and antenatal care (ANC) utilization, with p-values below 0.001. This indicates that each barrier significantly influences adolescents' attendance at ANC services. The detailed examination of each specific barrier is presented below:

5.4.2.1 Transport Barriers

The chi-square analysis revealed transportation as a significant barrier to antenatal care (ANC) utilization, with a chi-square value of 310.711 and a Cramér's V of 0.869, indicating a strong association. This finding aligns with previous research highlighting transportation challenges, particularly for rural adolescents who often face long distances to healthcare facilities (Osei & Tetteh, 2024).

Pregnant adolescents in rural areas frequently encounter difficulties in accessing ANC appointments due to limited public transport options and high travel costs. These barriers can

severely hinder their ability to attend regular antenatal care visits, which can lead to poorer health outcomes for both mothers and infants. Research by Johnson et al. (2023) and Lee et al. (2023) also supports this, emphasizing that inadequate transportation options exacerbate health disparities, particularly in rural populations.

Addressing transportation barriers is crucial to improving ANC attendance. Strategies such as providing community transport services or transport subsidies can help facilitate access to healthcare for pregnant adolescents. Such interventions would not only increase the likelihood of consistent ANC visits but also contribute to better maternal and neonatal health outcomes by ensuring that pregnant adolescents receive timely care.

5.4.2.2 Cost of Services

Cost emerged as a significant barrier to antenatal care (ANC) utilization, indicated by a chi-square value of 345.959 and a Cramér's V of 0.917. This finding is consistent with existing literature that highlights financial constraints as a major obstacle, particularly for adolescents. Research by Anderson et al. (2023) suggests that the costs associated with healthcare services, along with additional expenses such as transportation, severely limit adolescents' access to regular ANC services.

These financial barriers often prevent pregnant adolescents from attending essential ANC appointments, which can lead to adverse maternal and neonatal health outcomes. Previous studies corroborate this perspective, indicating that economic challenges can exacerbate health disparities among young mothers (Nguyen et al., 2022; Patel & Chen, 2023). High healthcare costs may force adolescents to choose between attending ANC visits and other pressing financial needs, such as food or housing, further compounding their vulnerabilities.

Addressing these financial obstacles is crucial for improving ANC attendance. Implementing policies that reduce healthcare costs, such as subsidized or free services for adolescents, and providing transport support, can significantly improve ANC attendance rates. These interventions would alleviate the economic burden on pregnant adolescents, enhancing their access to necessary healthcare services and ultimately promoting better health outcomes for both mothers and their infants.

5.4.2.3 Stigma

The analysis indicated a significant relationship between stigma and antenatal care (ANC) utilization, with a chi-square value of 358.763 and a Cramér's V of 0.934. This underscores stigma as a formidable barrier to accessing ANC services. Social stigma surrounding

adolescent pregnancy often leads to fear of judgment or discrimination, causing many pregnant adolescents to avoid seeking necessary healthcare (Smith et al., 2023).

The negative impact of stigma on healthcare utilization can result in decreased ANC attendance, depriving adolescents of essential maternal healthcare services. This finding aligns with previous studies that similarly highlighted how societal perceptions of adolescent pregnancy can discourage young mothers from seeking support and services (Jones et al., 2022; Lee & Martinez, 2023). Adolescents may internalize societal judgments, leading to feelings of shame and isolation that discourage them from attending ANC appointments.

Addressing this stigma is crucial for improving ANC attendance and ensuring that adolescent mothers receive the care they need. Community awareness campaigns and supportive interventions are necessary to create a more accepting and non-judgmental environment for adolescent mothers. By fostering a culture of understanding, empathy, and support, stigma can be reduced, ultimately encouraging greater utilization of ANC services. This will promote better health outcomes for both mothers and their infants, ensuring that adolescents receive the comprehensive care needed during pregnancy.

5.4.2.4 Provider Attitudes

The analysis revealed a strong correlation between negative attitudes from healthcare providers and antenatal care (ANC) utilization, with a chi-square value of 450.182 and a Cramér's V of 1.047. This suggests that pregnant adolescents who encounter unsupportive or dismissive healthcare providers are significantly discouraged from attending ANC services. These findings align with recent literature, including the study by Brown and Evans (2024), which emphasizes that negative interactions with healthcare providers can create barriers to care and reduce service utilization among young mothers.

Adolescents may already be dealing with various emotional, psychological, and social challenges, and unsupportive or negative attitudes from healthcare providers can worsen their sense of isolation or inadequacy. As noted by Johnson et al. (2023), positive experiences with healthcare providers—such as respectful communication, empathy, and non-judgmental care—are essential for fostering trust and encouraging consistent engagement with healthcare services.

Addressing provider attitudes is crucial for promoting better maternal health outcomes. A supportive and welcoming care environment can significantly influence adolescents' willingness to seek and utilize ANC services. Training programs focused on improving communication skills, cultural sensitivity, and empathy for young patients can help create a more conducive environment for pregnant adolescents. By prioritizing the quality of provider-patient interactions, we can increase ANC attendance and improve overall satisfaction with care, ensuring that adolescents receive the necessary support throughout their pregnancy journey.

5.4.2.5 Lack of Knowledge

The analysis revealed a robust association between lack of knowledge about antenatal care (ANC) services and attendance, evidenced by a chi-square value of 496.230 and a Cramér's V of 1.099. This indicates that limited awareness of available services is a significant barrier to ANC utilization. These findings align with previous research, such as that by Baker et al. (2023), which similarly emphasizes the critical role of knowledge in accessing healthcare services. Many adolescents may not fully grasp the importance of regular ANC visits or may be unaware of the range of services offered.

A lack of knowledge about ANC services can significantly impact adolescent health-seeking behaviors, as they may underestimate the importance of early and consistent prenatal care. Adolescents might not be aware of the preventive measures, screenings, and treatments that are part of regular ANC visits, potentially putting both maternal and neonatal health at risk. This finding underscores the need for targeted educational interventions and community outreach programs designed to enhance awareness and understanding of ANC services.

Efforts to improve knowledge among adolescents can play a pivotal role in increasing service uptake, as highlighted by studies emphasizing the effectiveness of education in promoting health-seeking behaviors (Thompson et al., 2022; Garcia et al., 2021). By addressing this knowledge gap through school-based programs, peer education, and community awareness campaigns, we can empower adolescents to take charge of their health, ultimately improving maternal and infant health outcomes within this vulnerable population.

5.5 Regression Analysis

5.5 Regression Analysis

A regression analysis was conducted to assess the effect of demographic and psychosocial factors, as well as perceived barriers, on antenatal care (ANC) attendance among the respondents. The model demonstrated a strong predictive capability, with an R-value of 0.947, indicating a robust correlation between the predictors—age, parental status, gestational stage, psychosocial factors, and perceived barriers—and ANC attendance. The R^2 value of 0.897 suggests that 89.7% of the variability in ANC attendance can be accounted for by these factors, with the overall model being statistically significant ($F = 707.984$, $p < 0.05$).

The regression equation formulated from this analysis is as follows:
Antenatal Care Attendance = 0.338 + 0.592(Age) - 0.089(Parent Status) + 0.562(Gestation Stage) - 0.198(Psychosocial Factors) - 0.205(Perceived Barriers).

These findings suggest that age, gestational stage, and psychosocial factors, among others, are key determinants in influencing ANC attendance. Specifically, the positive coefficient for age (0.592) indicates that older adolescents are more likely to attend ANC services, while the negative coefficients for parental status (-0.089), psychosocial factors (-0.198), and perceived barriers (-0.205) highlight their detrimental impact on attendance. These results are consistent with recent studies that emphasize the critical role of demographic and psychosocial determinants in healthcare access. For instance, Phelan et al. (2021) underscore that younger adolescents face distinct challenges that can deter ANC attendance, while Bvunzawabaya et al. (2022) and Adhikari et al. (2023) have similarly documented the influence of psychosocial factors on health-seeking behaviors.

Additionally, the significant impact of perceived barriers in this study aligns with the literature, which emphasizes the importance of addressing systemic and situational obstacles to improve access to healthcare. These findings reinforce the need for comprehensive interventions that address both the individual (age, psychosocial factors) and systemic (barriers, parental support) factors influencing ANC utilization. Tailored, context-specific strategies are essential for overcoming these barriers, ensuring better access to maternal healthcare, and improving health outcomes for pregnant adolescents.

5.6 Chapter Summary

The study's findings have been examined and compared with previous research. To a large extent, the results align with earlier studies, demonstrating consistency with established research. The propositions derived from this study support and validate the conceptual models previously proposed.

CHAPTER SIX

SUMMARY, CONCLUSION, RECOMENDATION

6.1 Introduction

This chapter provides a comprehensive overview of the research conducted on the psychosocial effects of adolescent pregnancy on maternal services utilization in Rongai Sub County, Nakuru County, Kenya. It synthesizes the key findings, draws conclusions based on the study's objectives, and offers recommendations for policy, practice, and further research. This discussion is grounded in the data analysis related to the study's general and specific objectives, focusing on sociodemographic factors, psychosocial determinants, the prevalence and severity of psychosocial effects, and the utilization of antenatal care (ANC) services.

6.2 Summary of the Findings

6.2.1 Sociodemographic and Psychosocial Determinants

The study identified several sociodemographic factors significantly associated with optimal maternal services utilization among pregnant adolescents. Key determinants include age, socio-economic status, educational level, and family structure. Adolescents from lower socio-economic backgrounds and with lower educational attainment were less likely to access maternal services optimally. Psychosocial determinants such as mental health status, social support, and self-efficacy were also critical. Adolescents experiencing higher levels of psychosocial stress, including anxiety and depression, showed reduced engagement with maternal health services.

6.2.2 Prevalence and Severity of Psychosocial Effects

The research revealed a high prevalence of psychosocial effects among pregnant adolescents in Rongai Sub County. Common issues include high levels of stress, anxiety, and social stigma. These psychosocial effects were found to significantly impact the adolescents' mental well-being and, consequently, their utilization of maternal health services. Severity varied, with some adolescents experiencing profound psychological distress that hindered their ability to seek and use maternal care effectively.

6.2.3 Association Between Psychosocial Effects and ANC Utilization

The study demonstrated a significant association between psychosocial effects and the utilization of antenatal care services. Pregnant adolescents experiencing severe psychosocial distress were less likely to attend regular ANC appointments. Factors such as lack of emotional support, high levels of stress, and perceived stigma were found to negatively affect ANC service utilization. This highlights the need for integrated psychosocial support within maternal health services.

6.2.4 Perceived Barriers and Facilitators

The exploration of perceived barriers and facilitators revealed several critical factors influencing maternal service utilization. Barriers include lack of transportation, financial constraints, and limited access to information. Facilitators identified include supportive family members, accessible health services, and community-based interventions. Addressing these barriers and enhancing facilitators are crucial for improving ANC service uptake among pregnant adolescents.

6.3 Conclusions from the Study

The study underscores the complex interplay of sociodemographic and psychosocial factors in influencing maternal services utilization among pregnant adolescents in Rongai Sub County. The findings highlight the significant impact of psychosocial effects on health service utilization and the necessity for targeted interventions that address both the psychological and practical needs of adolescent mothers. The association between psychosocial distress and reduced ANC utilization calls for an integrated approach that combines mental health support with maternal health services.

6.4 Recommendations from the Study

The following recommendations were presented to mitigate the psychosocial effects of the high rate of unplanned pregnancy among adolescents.

6.4.1 Policy Recommendations

1) **Integration of Psychosocial Support**

Health policies should promote the integration of psychosocial support into maternal health services. Establishing counseling services within ANC clinics can help address the mental health needs of adolescent mothers and improve service utilization.

2) **Community-Based Interventions**

Develop community-based programs to increase awareness and reduce stigma associated with adolescent pregnancy. Engaging community leaders and stakeholders in these initiatives can enhance their effectiveness.

6.4.2 Practical Recommendations

1) **Enhanced Accessibility**

Improve the accessibility of maternal services by providing transportation assistance and reducing financial barriers. Implementing mobile health clinics could be an effective strategy for reaching remote areas.

2) **Educational Programs**

Implement educational programs for adolescents and their families to increase knowledge about the importance of regular ANC visits and available support services.

6.5 Recommendations for Further Research

To build upon the findings of this study and address the gaps identified, the following areas are recommended for further investigation:

1) Future research should include longitudinal studies to assess the long-term impact of psychosocial factors on maternal health service utilization and outcomes. By tracking the same group of adolescents over an extended period, researchers can gain a deeper understanding of how psychosocial challenges evolve over time and whether interventions implemented during pregnancy have sustained benefits. Longitudinal studies will also provide critical insights into the long-term health, social, and economic consequences of adolescent pregnancy, thus helping to shape more effective and lasting interventions.
2) To enhance the generalizability of the findings, future studies should expand their geographic scope to include diverse regions with varying socio-economic contexts. This will allow for a comprehensive examination of whether the psychosocial factors and

barriers to antenatal care identified in this study hold true across different populations. Research in rural, urban, and peri-urban areas, as well as in countries with differing health systems and cultural norms, can provide valuable insights into the universality or specificity of these findings. Such research could help tailor interventions to meet the needs of diverse communities and improve the accessibility and effectiveness of maternal healthcare across different settings.

3) Further research should focus on evaluating the effectiveness of specific interventions aimed at mitigating the psychosocial barriers to ANC utilization. Studies could investigate the impact of community-based support programs, mental health services, and targeted educational campaigns on improving the psychological well-being of pregnant adolescents and their healthcare utilization. This would help identify the most effective strategies for addressing stigma, anxiety, isolation, and other psychosocial factors that hinder access to antenatal care.

4) Future research could explore the role of social support networks, including family, friends, and community organizations, in influencing the antenatal care behaviors of pregnant adolescents. This would involve investigating how different types of support—emotional, financial, and informational—affect healthcare access and maternal health outcomes. Understanding the dynamics of social support can help refine strategies to create more robust support systems for adolescent mothers.

5) Further studies should adopt an intersectional approach to explore how various socio-demographic factors, such as age, education, income, religion, and parental status, intersect to shape the experiences and healthcare access of pregnant adolescents. This would provide a more nuanced understanding of how multiple identities and circumstances influence psychosocial outcomes and ANC utilization. By examining the intersections of these factors, researchers can develop more tailored and inclusive interventions that consider the complexity of adolescent pregnancy.

REFERENCES

Adams, K., & Lee, J. (2023). Social stigma and emotional distress in adolescent pregnancies: A comprehensive review. *Journal of Adolescent Health, 72*(1), 33- 42.

Adams, K., et al. (2020). "The impact of social support on social isolation among pregnant adolescents." *Journal of Adolescent Health*, 66(4), 455-463.

Adamu, I., & Bello, B. (2022). "The State of Adolescent Pregnancy Research in Sub-Saharan Africa: A Review of Recent Studies." *African Journal of Reproductive Health*, 26(2), 40-54. doi:10.29063/ajrh2022/v26i2.4.

Ahmed, R., & Hasan, S. (2023). Stigmatization and its effects on adolescent pregnancy: A review. *Journal of Adolescent Health*, 71(5), 657-663.

Ahmed, R., Jansen, T., & Hassan, M. (2022). Religion and health service utilization: A review. *Journal of Health and Social Behavior*, 63(4), 523-536.

Ahmed, S., & Hasan, M. (2023). Stigma and discrimination associated with adolescent pregnancy: A review. *Journal of Adolescent Health*, 73(1), 12-20.

Ahmed, S., Khan, M., & Miller, L. (2022). The impact of psychosocial factors on maternal health service utilization among adolescents. *Journal of Adolescent Health*, 70(4), 567- 574.*And Practice* (4th ed.). Sage Publications.

Anderson, C., Lopez, R., & Patel, S. (2022). The role of community health workers in culturally tailored health interventions: A review. *Global Health Journal, 28*(3), 415-425.

Anderson, K., & Lewis, J. (2023). The intersection of stigma and socio-economic barriers in maternal health service utilization. *Journal of Social Health Studies*, 18(2), 135-150.

Anderson, R., Brown, T., & Evans, L. (2023). Financial instability and psychosocial effects

Approaches (4th ed.). AltaMira Press.

Asiamah, N., Mensah, S., & Oteng-Abayie, E. F. (2022). *Research Methods: The Practical Guide for Social Research*. Routledge.

Babbie, E. (2020). *The Practice of Social Research*. Cengage Learning.

Baird, J., Leach, C., & Smith, R. (2019). The role of social support in enhancing maternal health care utilization among adolescents. Journal of Adolescent Health, 64(4), 491-499.

Baird, S., Hamory, S., & Osei, A. (2019). The impact of community-based programs on adolescent maternal health: Evidence from a rural setting. *Journal of Community Health*, *44*(4), 567-575.

Baker, K., Patel, M., & Jones, H. (2021). The role of mental health in antenatal care utilization in low-income countries. Journal of Maternal Health, 15(2), 123-135.

Baker, K., Patel, M., & Jones, H. (2022). The role of social isolation in antenatal care `utilization: Evidence from the United Kingdom. *Journal of Maternal Health*, 17(3), 45-58.

Baker, S., Jones, P., & Bevan, S. (2023). The role of antenatal care in mitigating psychosocial stress among pregnant adolescents. *Maternal and Child Health Journal*, 27(4), 123-134.

Baumeister, R. F. (2013). *The self: Understanding the complexities of human behavior*. Psychological Perspectives.

Beauchamp, T. L., & Childress, J. F. (2019). *Principles of Biomedical Ethics* (8th ed.). ` Oxford University Press.

Bernard, H. R. (2006). *Research Methods in Anthropology: Qualitative and Quantitative*

Biesta, G. (2010). Pragmatism and the philosophical foundations of mixed methods research. *SAGE Handbook of Mixed Methods in Social & Behavioral Research*, 95-118.

Brown, A., & Davis, L. (2023). Financial barriers to prenatal care in urban settings in theUnited States. *American Journal of Public Health*, 113(1), 45-54.

Brown, A., & Davis, R. (2020). Caregiver support and adolescents' health service utilization: A systematic review. Journal of Adolescent Health, 66(2), 123-130.

Brown, A., Patel, R., & Smith, J. (2022). Family support and its impact on antenatal care attendance among pregnant adolescents. Maternal and Child Health Journal, 26(2), 213-225.

Brown, A., Patel, R., & Smith, J. (2022). The role of family support in maternal health service utilization among adolescents: A mixed-methods study. *Journal of Adolescent Health*, 71(2), 256-264.

Brown, K., & Evans, M. (2024). Anxiety in adolescent pregnancy: An empirical analysis. *Journal of Maternal Mental Health*, 38(2), 65-74.

Brown, K., Patel, M., & Smith, J. (2022). The impact of integrated psychosocial support on maternal health service utilization: Evidence from the UK. *Journal of Maternal Health*, 18(2), 125-138.

Brown, K., Patel, M., & Smith, J. (2023). Economic barriers to maternal health services utilization in low-income settings: Evidence from Kenya. *Journal of Maternal Health*, 15(2), 134-146.

Brown, K., Patel, M., & Smith, J. (2023). The impact of social stigma on maternal health service utilization among pregnant adolescents in low-income urban areas. *American Journal of Public Health*, 113(2), 198-210.

Brown, T., & Davis, M. (2020). Cultural beliefs and health behaviors among adolescents: Implications for health service utilization. *Journal of Adolescent Health, 66*(1), 45-52.

Brown, T., & Davis, M. (2021). Psychosocial effects among refugees and migrants: A comprehensive review. *Journal of Migration and Health, 7*(1), 45-59.

Burns, N., & Grove, S. K. (2023). *Understanding Nursing Research: Building an Evidence-Based Practice* (8th ed.). Elsevier.

Carmines, E. G., & Zeller, R. A. (2022). *Reliability and Validity Assessment*. Sage Publications.

Chao, C., Müller, J., & Stein, S. (2024). Assessing economic barriers to maternal health care in Germany: Implications for policy. *European Journal of Public Health*, 34(2), 230-239.

Chege, F. N., & Sifuna, D. N. (2020). "The impact of adolescent pregnancy on educational attainment in Kenya: A review." Education and Development, 30(1), 45-60.

Chen, J., et al. (2007). "Prevalence and predictors of depression in adolescent mothers: A longitudinal study." *Journal of Child Psychology and Psychiatry*, 48(9), 927-934.

Chen, L., Wang, X., & Li, Y. (2023). Economic barriers to maternal health service utilization in semi-urban China. *Asian Journal of Public Health*, 18(1), 50-62.

Chen, X., et al. (2007). "Adolescent pregnancy and its psychosocial impact: A review of literature." Journal of Adolescent Health, 40(3), 232-243.

Chen, X., Qiao, M., & Wu, Q. (2007). Pregnancy-related disorders among adolescents in developing countries. Journal of Adolescent Health, (3), 221-228.

Clark, K. J., Roberts, L., & Williams, H. (2019). Mental health and maternal health service utilization among adolescents: A cross-sectional study. Journal of Adolescent Health, 64(5), 645-652.

Clark, R. E., et al. (2019). "Mental health and adolescent pregnancy: Implications for maternal health." *Journal of Adolescent Health*, 65(2), 137-145.

Clark, R. E., et al. (2019). "Mental health and adolescent pregnancy: Implications for maternal health." Journal of Adolescent Health, 65(2), 137-145.

Clemmens, D. (2022). "The psychological impacts of adolescent pregnancy: A longitudinal study." Journal of Adolescent Research, 37(4), 492-511.

Cohen, L., Manion, L., & Morrison, K. (2018). *Research Methods in Education* (8th ed.). Routledge.

Coley, R. L., & Chase-Lansdale, P. L. (2018). "Adolescent Pregnancy: Its Impact on Educational Attainment and Economic Well-Being." *American Journal of Public Health*, 108(1), 45-52.

Connelly, L. M. (2008). *Pilot Studies*. Medsurg Nursing, 17(6), 411-414. This article discusses the role of pilot studies in research and outlines methods for evaluating instrument reliability.

Connelly, L. M. (2008). *Pilot Studies*. Medsurg Nursing, 17(6), 411-414. This article instrument reliability.

Cox, J. L., Murray, D., & Jones, P. (2022). *The psychosocial impact of adolescent pregnancy on maternal health and service utilization*. *Journal of Adolescent Health*, 71(2), 200-207. https://doi.org/10.1016/j.jadohealth.2022.03.002

Creswell, J. W., & Creswell, J. D. (2017). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Sage Publications.

Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). Sage Publications.

Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and Conducting Mixed Methods Research* (3rd ed.). Sage Publications.

Darroch, J. E., et al. (2016). "Adding it Up: Investing in Contraception and and Newborn Health, 2017." *Guttmacher Institute*.

Darroch, J. E., Woog, V., Bankole, A., & Ashford, L. S. (2016). Adding it up: Costs and benefits of contraceptive services. Guttmacher Institute.

DeVellis, R. F. (2016). *Scale Development: Theory and Applications* (4th ed.). Sage Publications

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. Wiley.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method* (4th ed.). Wiley.

Dlamini, Z., Ndlovu, T., & Mthembu, S. (2021). Cultural influences on antenatal care uptake among South African adolescents. South African Journal of Public Health,10(1), 45-56.

Doku, D. T., & Biritwum, R. B. (2019). The role of marital status in maternal health care utilization in Ghana. *BMC Public Health*, 19, 1048.

Doku, D., & Nkrumah, B. (2019). Factors influencing antenatal care service utilization among adolescents in rural Ghana. *BMC Pregnancy and Childbirth*, 19(1), 412.

Emina, J. B., et al. (2014). "Education and its impact on maternal health service utilization in sub-Saharan Africa." BMC Public Health, 14, 111.

Faraway, J. J. (2016). Practical Regression and Anova Using R (2nd ed.). CRC Press.

Field, A. P. (2023). *Discovering Statistics Using IBM SPSS Statistics*. Sage Publications.

Fink, A. (2017). *How to Conduct Surveys: A Step-by-Step Guide*. Sage Publications.

Gage, A. J. (2007). Barriers to and determinants of contraceptive use in developing countries. *International Family Planning Perspectives*, 33(4), 183-191.

Gage, A. J. (2007). The determinants of antenatal care utilization in Uganda. *Social Science & Medicine*, 66(1), 11-22

Ganchimeg, T., et al. (2014). "Pregnancy and childbirth outcomes among adolescents." The Lancet, 384(9946), 159-165.

Ganchimeg, T., Ota, E., Morisaki, N., & et al. (2014). *Pregnancy and childbirth outcomes among adolescent mothers: A World Health Organization multicountry study*. *BJOG: An International Journal of Obstetrics & Gynaecology*, 121(Suppl 1), 40-48. https://doi.org/10.1111/1471-0528.12630

Garcia, R., Johnson, L., & Martinez, A. (2022). Emotional distress in pregnant adolescents: An exploratory study. *Journal of Maternal and Child Health, 27*(2), 200-210.

Gavin, N. I., et al. (2018). "Social isolation and its impact on mental health among pregnant adolescents." *American Journal of Preventive Medicine*, 54(2), 123-130.

Gelman, A., & Hill, J. (2023). *Data Analysis Using Regression and Multilevel/Hierarchical*

Gibson, C., & McCabe, M. (2023). Education and coping strategies among adolescent mothers. *Journal of Youth Studies*, 26(3), 345-360.

Gibson, K., Smith, L., & Jones, A. (2022). Transportation barriers to maternal health care in rural communities: A systematic review. *Global Health Action, 15*(1), 102-115.

Gibson, L., Patel, M., & Lee, J. (2022). The impact of transportation barriers on maternal health service utilization: A comprehensive review. Journal of Health Access, 14(3), 301-317.

Gibson, L., Patel, M., & Smith, J. (2022). Lack of transportation and its impact on maternal health service utilization among pregnant adolescents in Rongai Sub-County, Kenya. *International Journal of Maternal Health Studies*, 12(3), 78-92.

Gibson, L., Patel, M., & Smith, J. (2022). The impact of financial constraints on maternal health service utilization among pregnant adolescents in rural Kenya. *International Journal of Maternal and Child Health*, 31(4), 200-215.

Gibson, T., & McCabe, J. (2023). Educational attainment and psychosocial challenges in adolescent pregnancy. *International Journal of Women's Health*, 15(3), 78-87.

Global Childhood. (2019). Childhood data and statistics. [Online] Retrieved from [Global Childhood Database].

Graham, J., Smith, L., & Taylor, R. (2018). Emotional stress and its impact on antenatal care attendance among adolescents. Global Health Review, 13(4), 67-80.

Gravetter, F. J., & Wallnau, L. B. (2021). *Statistics for the Behavioral Sciences* (10th ed.). Cengage Learning.Tabachnick, B. G., & Fidell, L. S. (2019). *Using Multivariate Statistics* (7th ed.). Pearson.

Greene, W. H. (2018). Econometric Analysis (8th ed.).

Harrison, A., & Pate, D. (2023). Unplanned pregnancies and antenatal care utilization: A comprehensive review. *Maternal Health Journal*, 28(2), 119-128.

Harrison, A., & Pate, P. (2023). Psychological effects of adolescent pregnancy and implications for health services. *Journal of Maternal and Child Health*, 27(2), 342-350.

Hastie, T., Tibshirani, R., & Friedman, J. (2024). *The Elements of Statistical Learning: Data*

Hosmer, D. W., Lemeshow, S., & Sturdivant, R. X. (2013). Applied Logistic Regression (3rd ed.).

Hulley, S. B., Cummings, S. R., Browner, W. S., Grady, D., & Newman, T. B. (2013). *Designing Clinical Research* (4th ed.). Wolters Kluwer.

in adolescent pregnancy. *Health Economics Review*, 13(1), 45-56.

Izugbara, C., et al. (2016). "Socioeconomic factors influencing maternal health service utilization in sub-Saharan Africa." BMC Health Services Research, 16, 35.J. Reed (Eds.), The self and social behavior (pp. 76-97). Routledge.

Jeri, H., Kimani, G., & Mwangi, M. (2023). Social isolation and its effects on antenatal care utilization in rural Kenya. *African Journal of Reproductive Health*, 27(1), 34-47.

Jeri, H., Kimani, G., & Mwangi, M. (2023). The effectiveness of peer counseling and educational workshops in increasing maternal health service utilization in Kenya. *African Journal of Reproductive Health*, 27(2), 56-70.

Jiang, Y., et al. (2021). "Community-based interventions for reducing stigma and improving access to care for pregnant adolescents." *International Journal of Gynecology & Obstetrics*, 154(1), 56-63.

Johnson, M., Lee, S., & Anderson, P. (2021). Rural disparities in health service utilization among adolescents with mental health issues. Rural Health Journal, 15(3), 211-219.

Johnson, M., Smith, R., & Lee, K. (2020). Adolescents' psychosocial effects: The role of academic stress and social media. *Journal of Adolescent Health, 67*(4), 478-487.

Johnson, M., Smith, R., & Lee, K. (2020). Urban adolescent mothers: An analysis of emotional well-being and support systems. Urban Health Review, 15(2), 76-85.Johnson, M., Smith, R., & Lee, K. (2021). Urban adolescent mothers: An analysis of emotional well-being and support systems. *Urban Health Review, 15*(2), 76-85.

Johnson, M., Smith, R., & Lee, K. (2021). Urban adolescent mothers: An analysis of emotional well-being and support systems. *Urban Health Review, 15*(2), 76-85.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33(7), 14-26.Johnson, R.,

Jones, A., Black, R., & Williams, M. (2019). Mental health challenges and antenatal care utilization among adolescents. International Journal of Adolescent Health, 22(3), 200-210.

Jones, A., Black, R., & Williams, M. (2021). Enhancing social support and its effect on antenatal care utilization among adolescents: A randomized controlled trial. *American Journal of Public Health*, 111(5), 789-800..

Jones, M., & Smith, T. (2021). Urban adolescent mothers: An analysis of emotional well-being and support systems. *Urban Health Review, 15*(2), 76-85.

Jones, P., & Bevan, S. (2024). Religious contexts and adolescent pregnancy: Implications for social support. *Social Science & Medicine*, 312, 115-123.

Jones, R. W., Anderson, J. M., & Davis, K. L. (2021). *Effective Strategies for Research Dissemination*. Cambridge University Press.

Jones, R., & Bevan, S. (2024). Religion and psychosocial support in adolescent pregnancy: Comparative analysis. *Social Science & Medicine*, 314, 114-124.

Kanyonga, K., et al. (2020). "The role of marital status in maternal health service utilization: Evidence from Rwanda." Journal of Public Health Research, 9(1), 12-22.

Kariuki, M., Wangari, R., & Ochieng, R. (2023). Social stigma and its effects on maternal health service utilization among pregnant adolescents in Nairobi, Kenya. *Journal of Adolescent Health*, 72(4), 456-464.

Kariuki, S., Wanjiru, M., & Jeri, K. (2023). Social stigma and its effect on antenatal care utilization among adolescents in Kenya. *Kenyan Journal of Public Health, 18*(2), 76-89.

Kavanaugh, M. L., & Schwarz, E. B. (2013). "The effects of stigma on adolescent pregnancy: A systematic review." *Social Science & Medicine*, 89, 1-9.KDHS. (2014). "Kenya Demographic and Health Survey 2014." Kenya National Bureau of Statistics.

Kebede, E., et al. (2021). "The role of social support in maternal health service utilization among adolescents in Ethiopia." *Maternal and Child Health Journal*, 25(6), 1001-1010.

Kebede, E., et al. (2021). "The role of social support in maternal health service utilization among adolescents in Ethiopia." Maternal and Child Health Journal, 25(6), 1001-1010.

Kebede, E., et al. (2021). "The role of social support in maternal health service utilization among adolescents in Ethiopia." Maternal and Child Health Journal, 25(6), 1001-1010.

Kenya Data and Health Survey (2014). *Kenya Demographic and Health Survey 2014*. Kenya National Bureau of Statistics.

Kenya Data and Health Survey. (2014). Prevalence of adolescent pregnancy in Kenya. [Online] Retrieved from [Kenya Data and Health Survey Database].

Kenya Demographic and Health Survey (2020). Kenya Demographic and Health Survey 2020. Kenya National Bureau of Statistics.

Kenya National Bureau of Statistics. (2022). *Kenya Demographic and Health Survey 2022*. Nairobi: Kenya National Bureau of Statistics.

Kenya National Bureau of Statistics. (2023). *Nakuru County: Population and Housing Census*. Retrieved from KNBS.

Khan, M. M., Ahmed, R., & Smith, H. (2022). Education and healthcare utilization among pregnant adolescents in developing countries. *Health Policy and Planning*, 37(1), 45-56.

Khan, M. N., Khan, T., & Mirza, S. A. (2022). Educational attainment and healthcare access: Evidence from developing countries. *Global Health Action*, 15(1), 1-12

Khosla, R., & Karim, S. (2023). "Community-Based Interventions to Improve Maternal Health in Adolescents: Recent Advances and Future Directions." *BMC Public Health*, 23(1), 567. doi:10.1186/s12889-023-05948-0.

Kumar, A., Rao, K., & Singh, P. (2023). Impact of financial constraints on maternal health access in India: A mixed-methods approach. International Journal of Maternal and Child Health, 31(1), 45-58.

Kumar, A., Rao, K., & Singh, P. (2023). Impact of financial constraints on maternal health access in India: A mixed-methods approach. *International Journal of Maternal and Child Health*, 31(1), 45-58.

Kumar, A., Rao, K., & Singh, P. (2024). Exploring financial constraints in maternal health service utilization in India. *International Journal of Maternal and Child Health*, 32(1), 45-59.

Kumar, A., Singh, V., & Sharma, S. (2021). Determinants of antenatal care utilization among adolescent mothers in India. *Maternal and Child Health Journal*, 25(7), 1157-1166.

Kumar, R. (2019). *Research Methodology: A Step-by-Step Guide for Beginners* (5th ed.). Sage Publications. This edition includes updated practices for conducting pilot studies and refining research instruments.

Kumar, S., Robinson, A., & Gupta, N. (2023). The impact of social support on adolescent maternal health outcomes: Insights from recent research. *Maternal and Child Health Journal*, 27(3), 321-332.

Kumar, S., Singh, P., & Patel, M. (2021). Marital status and antenatal care utilization among adolescents. *Journal of Adolescent Health*, 68(3), 425-434.

Kutner, M. H., Nachtsheim, C. J., Neter, J., & Li, W. (2022). *Applied Linear Statistical Models*.

Lee, J., Smith, L., & Wang, Y. (2023). Family support and adolescent pregnancy outcomes: A review. *Family Relations*, 72(2), 232244.

Lee, S. Y., Smith, J., & Wang, Y. (2023). Parental support and adolescent healthcare access: A systematic review. Family Practice, 40(1), 78-85.

Lee, S. Y., Smith, J., & Wang, Y. (2023). Parental support and adolescent healthcare access: A systematic review. *Family Practice*, 40(1), 78-85.

Lee, T., Nkosi, M., & Adams, H. (2023). Stigma and maternal health service access in urban South Africa: A mixed-methods study. *South African Journal of Public Health*, 16(1), 33-45.

Lee, Y., Kim, J., & Smith, H. (2023). The impact of family support on pregnancy outcomes. *Journal of Adolescent Health*, 72(5), 567-576.

Levin, K. A. (2006). Study design III: Cross-sectional studies. *Evidence-Based Dentistry*, 7(1), 24-25.

Lince-Deroche, N., & Rataemane, N. R. (2021). "Psychosocial Outcomes of Adolescent Pregnancy: A Review of Recent Evidence." *International Journal of Women's Health*, 13, 123-134. doi:10.2147/IJWH.S297456.

Lomax, R. G., & Hahs-Vaughn, D. L. (2012). An Introduction to Statistical Concepts (3rd ed.). Routledge.

Lumpkin, J., & Valente, T. W. (2023). Age and health service utilization among adolescents: A review. *Journal of Adolescent Health*, 72(6), 778-786

Maliki, A. (2012). "Socioeconomic implications of adolescent pregnancies in developing countries." Global Health Action, 5(1), 18956.

Maliki, S. (2012). "Mental health issues in adolescent pregnancy: A review." *Journal of Adolescent Health*, 51(3), 214-222.

Martin, J., Thompson, L., & Green, R. (2021). Culturally tailored health interventions in indigenous communities: A systematic review. *American J ournal of Public Health, 111*(4), 567-575.

Martin, J., Thompson, L., & Green, R. (2021). Culturally tailored health interventions in indigenous communities: A systematic review. *American Journal of Public Health, 111*(4), 567-575.

Martin, J., Thompson, S., & Green, R. (2022). The impact of integrated care models on adolescents with mental health issues: A review. Health Services Research, 57(4), 789-800.

Martin, J., Thompson, S., & Green, R. (2022). The psychosocial impact of the COVID-19 pandemic: A global review. *Global Health Journal, 29*(2), 135-148.

Martinez, M., & Roberts, S. (2023). Longitudinal impacts of stigma on maternal health outcomes: A review of current research. *International Journal of Maternal and Child Health,* 30(1), 45-60.

Martinez, R., Lopez, G., & Garcia, M. (2023). Maternal health service access in remote Bolivia: The role of transportation. *Latin American Journal of Health Policy*, 20(1), 65-80.

Maxwell, J. A. (2012). *A Realist Approach for Qualitative Research*. Sage Publications.

McDonald, J. H., & Gardner, R. C. (2024). *Handbook of Biological Statistics*. Sparky House McGraw-Hill Education.

Miller, C., Brown, K., & Wilson, M. (2021). The impact of parental support on healthcare utilization among adolescents. *Health Services Research,* 56(2), 345-357.

Miller, L., Greene, D., & Peters, M. (2021). Education and information as facilitators of maternal health care utilization: A review of current practices. *International Journal of Women's Health, 13*(5), 145-158.

Miller, L., Kumar, A., & Harrison, A. (2021). The role of social support in maternal healthcare utilization among adolescents. *Social Science & Medicine,* 270, 113670.

Miller, R., Hargreaves, J., & Lavis, J. (2022). *Barriers and facilitators to maternal health service utilization among adolescents in low-resource settings*. *Health Policy and Planning*, 37(1), 92-101. https://doi.org/10.1093/heapol/czab084*Mining, Inference, and Prediction. Springer.*

Ministry of Health (2022). *Annual Health Sector Performance Report*. Government of Kenya.

Ministry of Health, Kenya. (2022). "Annual Report on Maternal Health Services in Kenya."

Ministry of Health. (2013). Annual health statistical report. Government of Kenya.

Models. Cambridge University Press.

MoH (Ministry of Health). (2023). *Annual Health Statistics Report 2023*. Nairobi: Ministry of Health, Kenya.

Moyer, C. A., & Mustafa, A. (2014). Barriers and facilitators to maternal healthcare utilization in low-income settings: A systematic review. *Health Policy and Planning*, *29*(8), 915-929.

Mthembu, S., Ndlovu, T., & Dlamini, Z. (2020). Community-based psychosocial interventions and their impact on antenatal care utilization among South African adolescents. *South African Journal of Public Health*, 14(1), 78-89.

Mthembu, S., Ndlovu, T., & Dlamini, Z. (2020). Psychosocial barriers to antenatal care among South African adolescents. Journal of South African Studies, 25(1), 89-101.

Mthembu, S., Ndlovu, T., & Dlamini, Z. (2020). Social isolation and antenatal care utilization among South African adolescents: A qualitative study. *South African Journal of Public Health*, 12(2), 98-112.

Mugenda, O. M., & Mugenda, A. G. (2023). *Research Methods: Quantitative and Qualitative Approaches*. Act Press. This recent edition covers definitions and applications of target and accessible populations, with contemporary examples and methodologies.

Mulugeta, H., Hailu, A., & Derso, T. (2022). "Barriers to maternal health service utilization among adolescent mothers in Ethiopia: A qualitative study." BMC Pregnancy and Childbirth, 22(1), 112.

Munro, M. R., & Kiser, L. J. (2022). "Adolescent Pregnancy and Maternal Health Services: Understanding the Psychosocial Implications." *Journal of Adolescent Health*, 70(3), 413-420. doi:10.1016/j.jadohealth.2021.10.007.

Musonga, J. (2014). "Teenage pregnancy in Kenya: Prevalence and impact on educational outcomes." International Journal of Social Science Research, 6(2), 98-112.

Muthengi, E., Gakure, R., & Kabiru, C. (2021). "Maternal health outcomes of adolescent pregnancies in Kenya: Evidence from the Kenya Demographic and Health Survey." International Journal of Public Health, 66, 1602634.

Mwaura, J., Kamau, A., & Wambui, J. (2023). "Healthcare Utilization in Nakuru County: A Comparative Study of Health Facilities." *Journal of Public Health and Epidemiology*, 15(1), 45-55. doi:10.5897/jphe2023.1005.

National Academies of Sciences, Engineering, and Medicine. (2024). *The Health and Well-Being of Adolescents: Current Evidence and Future Directions*. The National Academies Press. This publication provides recent insights into adolescent health issues, including the psychological impacts of pregnancy among adolescents.

Ndlovu, T., Mthembu, S., & Dlamini, Z. (2019). Socioeconomic factors affecting antenatal care attendance in South Africa. South African Journal of Healthcare, 14(2), 134-146.

Ngugi, R., Ochieng, B., & Otieno, G. (2022). The role of community- based health programsin improving maternal service utilization among adolescents. *African Journal of Reproductive Health, 26*(3), 100-112.

Nguyen, T., & Patel, A. (2023). Telehealth and its impact on adolescents' access to mental health and maternal health services. Telemedicine and e-Health, 29(1), 56-64.

Nguyen, T., Martinez, R., & Kim, J. (2019). Cultural competence in healthcare delivery for minority communities: Insights from urban settings. *Health Services Research, 54*(2), 210-219.

Nguyen, T., Patel, A., & Lopez, R. (2023). Workplace stress and psychosocial effects: Insights from recent studies. *Occupational HealthReview*, *16*(3), 214-226.

Nolan, S., Zhang, Y., & Edwards, T. (2021). Emotional and practical support in maternal health care: A study of adolescent pregnancies in Kenya. Global Health Action, 14(1), 198-210.

Nolan, S., Zhang, Y., & Edwards, T. (2021). Social support and its effects on health service utilization among pregnant adolescents in Kenya. *Global Health Action*, 14(1), 198-210.

Nove, A., Matthews, Z., & Morris, L. (2023). Age and psychosocial effects of a adolescent pregnancy: A systematic review. *Reproductive Health*, 20(1), 9-18.

Nove, A., Sacks, E., & Shaya, G. (2023). Age-related stressors in adolescent pregnancy. *Adolescent Health Review*, 45(6), 789-799.

Nyaga, G. (2010). "Exploring the challenges of adolescent mothers in Kenya." Kenyan Journal of Social Issues, 12(1), 24-35.

O'Brien, R., Patel, A., & Kumar, S. (2023). Access to antenatal care in rural India: The impact of transportation barriers. *Journal of Global Health*, 13(2), 123-135.

Ogolla, L., Kibet, D., & Nduku, J. (2023). "Regional disparities in adolescent pregnancy and maternal health service utilization in Kenya." Journal of Rural Health, 39(1), 80-95.

Omondi, B., & Kiarie, J. (2023). "Accessibility and Transportation Infrastructure: Implications for Health Service Delivery in Nakuru County." *Journal of Transport and Health*, 21, 100-110. doi:10.1016/j.jth.2022.101158.

Organization (2021). Global Health Estimates: Child and Adolescent Health.

Orme, J. G., et al. (2015). "The role of stigma in adolescent maternal health: A review of the literature." *Health & Social Work*, 40(2), 105-114.

Osei, C., & Tetteh, E. (2024). Rural-urban disparities in psychosocial effects of adolescent pregnancy in Kenya. *Geographical Journal*, 190(2), 145-156.

Pallant, J. (2020). SPSS Survival Manual (7th ed.). Allen & Unwin.

Pallant, J. (2020). *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using IBM SPSS* (7th ed.). McGraw-Hill Education.

Patel, M., Jones, A., & Williams, R. (2022). Financial barriers to maternal health services utilization among adolescents in Kenya: A quantitative study. Journal of Global Health, 12(4), 123-135.

Patel, M., Jones, A., & Williams, R. (2022). Financial barriers to maternal health services utilization among adolescents in Kenya: A quantitative study. *Journal of Global Health*, 12(4), 123-135.

Patel, S., Green, R., & Thompson, J. (2023). Psychosocial impact of adolescent pregnancy: A study of socio-economic influences and support systems. *Journal of Maternal and Child Health, 28*(3), 150-162.

Patel, S., Green, R., & Thompson, J. (2023). Psychosocial impact of adolescent pregnancy: A study of socio-economic influences and support systems. *Journal of Maternal and Child Health, 28*(3), 150-162.

Patel, V., et al. (2018). "Social support and healthcare utilization among pregnant adolescents: A global perspective." *International Journal of Gynecology & Obstetrics*, 140(3), 287-293.

Patel, V., et al. (2018). "The impact of social support on healthcare utilization among pregnant adolescents: A global review." International Journal of Gynecology & Obstetrics, 140(3), 287-293.

Patino, M. T. (2018). *Guidelines for Developing Inclusion and Exclusion Criteria*. *Journal of Clinical Research*, 22(3), 45-52. This article provides updated guidelines and best practices for establishing inclusion and exclusion criteria in research.

Patton, M. Q. (2015). *Qualitative Research & Evaluation Methods: Integrating Theory*

Pearson.Groves, R. M., Fowler, F. J., Couper, M. P., Lepkowski, J. M., & Singer, E. (2009). *Survey Methodology*.

Plan International (2019). *Because I Am a Girl: The State of the World's Girls 2019*.Plan International.

Plan International. (2019). Impact of COVID-19 on adolescent girls. [Online] Retrieved from[Plan International Reports] Publishing.

Robinson, J. P. (2020). *Measuring Social Attitudes: A Handbook for Researchers and Practitioners*. Routledge.

Salkind, N. J. (2017). *Statistics for People Who (Think They) Hate Statistics* (6th ed.). Sage Publications.

Sanchez, R., Gomez, J., & Martinez, A. (2023). Financial constraints and maternal health care access in rural Mexico: A comparative study. *Latin American Journal of Health Studies*, 22(3), 120-135.

Save the Children Kenya. (2020). "Adolescent Pregnancy in Kenya: A Review of Challenges and Recommendations."

Sedgh, G., Finer, L. B., Bankole, A., et al. (2015). "Adolescent pregnancy and its : Areview of literature." International Perspectives on Sexual and Reproductive Health, 41(2), 100-110.

Sedgh, G., Finer, L. B., Bankole, A., et al. (2019). "Adolescent pregnancy and its impact on maternal health and educational outcomes: A review of recent evidence." Journal of Adolescent Health, 65(2), 226-234.

Shah, I. H., & Ahman, E. (2012). "Unsafe Abortion: Global and Regional Estimates of the Incidence of Unsafe Abortion and Associated Mortality in 2008." *World Health Organization*.

Shah, I. H., & Ahman, E. (2012). Unsafe abortion: Global and regional estimates of the incidence of unsafe abortion and associated mortality in 2008. Reproductive Health Matters, 20(39), 1-18.

Shampoo, D., & Resnik, R. (2015). Advanced Data Analysis Techniques. Wiley.

Shuger, L. (2012). "The impact of adolescent parenthood on future opportunities: A review." Social Science & Medicine, 75(3), 440-449.

Shuger, L. (2022). "Economic and educational consequences of adolescent pregnancy: A longitudinal study." Social Science & Medicine, 275, 113697.

Sifuna, D. N., & Chege, F. N. (2006). "Teenage pregnancies in Kenya: A review of the situation." Education Research Journal, 7(1), 56-69.

Simkhada, B., Teijlingen, E. R., & Porter, M. (2008). The role of education in health care access: A review. *Health Policy Review*, 87(2), 143-151.

Simkhada, B., Teijlingen, E. R., Porter, M., & Simkhada, P. (2008). Factors affecting the utilization of antenatal care in developing countries: Systematic review of the literature. *Journal of Advanced Nursing*, 61(3), 336-344.

Singh, A., Nair, M., & Ghosh, S. (2012). Maternal age and healthcare utilization: An analysis of recent data. *International Journal of Maternal and Child Health*, 40(1), 55-64.

Singh, K., Kaur, R., & Kumari, N. (2012). Impact of sociodemographic factors on antenatal care utilization among adolescents. *International Journal of Public Health Research*, 4(2), 122-134.

Smith, A., & Zhao, L. (2022). Evaluating stigma reduction interventions in healthcare settings: A systematic review. *Health Education Research*, 37(4), 402-415.

Smith, A., Johnson, T., & Davis, M. (2022). Social stigma and antenatal care utilization among pregnant adolescents in rural Nigeria. *African Journal of Reproductive Health*, 26(3), 45-58.

Smith, J., & Johnson, L. (2017). Traditional beliefs and maternal health service utilization in rural communities. *Rural Health Journal, 14*(3), 189-198.

Smith, J., & Lee, K. (2018). Prevalence and severity of psychosocial effects in rural populations. *Rural Health Journal, 14*(2), 122-133.

Smith, J., & Lee, K. (2018). Stigma and healthcare utilization among pregnant adolescents. *Journal of Adolescent Health, 63*(5), 620-628.

Smith, J., & Lee, K. (2018). The effect of mental health issues on adolescents' utilization of general health services. General Health Research, 12(4), 300-312.

Smith, J., & Lee, K. (2021). Prevalence and severity of emotional distress in rural adolescent mothers. Rural Health Journal, 14(2), 122-133.

Smith, J., Ahmed, R., & Miller, L. (2020). Early initiation of antenatal care: Implications for maternal health. *Journal of Maternal and Child Health*, 24(3), 345-356.

Smith, J., Ahmed, R., & Miller, L. (2023). Addressing stigma and isolation in adolescent pregnancy: Strategies and interventions. *Journal of Adolescent Health*, 69(6), 839-849.

Smith, J., Ahmed, S., & Miller, L. (2020). Addressing the needs of pregnant adolescents: A review of intervention strategies. *Journal of Adolescent Health*, 66(5), 580-590.

Smith, L., Brown, K., & Davis, J. (2021). Exploring the role of economic hardship in maternal health service utilization in the United States. American Journal of Public Health, 111(7), 1125-1133.

Smith, R., Brown, K., & Davis, J. (2020). The impact of social support on antenatal care utilization: A review. Journal of Social Medicine, 19(2), 99-112.

Smith, R., Brown, K., & Davis, J. (2021). Psychosocial interventions and their impact on adolescent pregnancy outcomes in the United States. *American Journal of Public Health*, 111(6), 789-800.

Smith, R., Brown, K., & Davis, J. (2021). The impact of social support on antenatal care utilization: A mixed-methods study in the United States. *American Journal of Public Health*, 111(6), 789-800.

Smith, T., & Brown, M. A. (2022). *Publishing Research: A Guide to Getting Published in Peer-Reviewed Journals*. Routledge.

Smith, T., Johnson, R., & Turner, L. (2023). *Psychosocial factors influencing maternal health service use among adolescent mothers: A review*. *Maternal and Child Health Journal*, 27(2), 233-242. https://doi.org/10.1007/s10995- 022-03412-3

Spradley, J. P. (1979). *The Ethnographic Interview*. Holt, Rinehart and Winston. This classic text covers methods for collecting detailed qualitative data, including the use of purposive sampling.

Tabachnick, B. G., & Fidell, L. S. (2019). *Using Multivariate Statistics* (7th ed.). Pearson.

Tangwa, G. (2018). Cultural beliefs and maternal health service utilization: A study on the impact of traditional practices. *Journal of Cultural Health Studies, 12*(2),134-145.

Tashakkori, A., & Teddlie, C. (2010). *SAGE Handbook of Mixed Methods in Social & Behavioral Research*. Sage Publications.

Taylor, R., Brown, J., & Smith, A. (2022). Social support and its effect on antenatal care utilization in high-income settings. American Journal of Public Health, 112(5), 890- 902.

Theobald, S., & Paul, M. (2022). "Policy Implications of Adolescent Pregnancy : A Global Perspective." *Health Policy and Planning*, 37(1), 98-105. doi:10.1093/heapol/czab106.

Thomas, R., & Chen, Y. (2023). Addressing the multifactorial barriers to maternal health services: A framework for integrated interventions. *Public Health Policy Review*, 29(3), 221-234.

Thompson, R., & Brown, K. (2023). Financial and social barriers to healthcare access among pregnant adolescents: A systematic review. Global Health Journal, 18(2), 89-103.

Titaley, C., Dibley, M. J., & Roberts, C. (2010). Factors influencing the utilization of antenatal care services in Indonesia. *Journal of Global Health*, 10(4), 112-120.

UNFPA (United Nations Population Fund). (2022). *State of the World's Population 2022: Seeing the Invisible*. UNFPA. Retrieved from UNFPA Reports

UNFPA. (2020). "Adolescent Pregnancy: A Review of Global and Regional Evidence." United Nations Population Fund.

UNFPA. (2020). "Stigma and discrimination: Barriers to maternal health services for adolescents." *United Nations Population Fund*. Retrieved from UNFPA.

UNFPA. (2020). Impact of COVID-19 on gender and reproductive health. United Nations Population Fund.

UNICEF (United Nations Children's Fund). (2023). *Adolescent Pregnancy and Maternal Health in Kenya: A Regional Assessment*. UNICEF. Retrieved from UNICEF Reports

United Nations (2022). Sustainable Development Goals Report 2022. United Nations.

United Nations Population Fund (UNFPA) (2020). *State of the World Population 2020: Against My Will—Defying the Practices that Harm Women and Girls and Undermine Equality*. UNFPA.

United Nations Population Fund (UNFPA) (2022). State of World Population 2022: Seeing the Unseen – The Case for Action in the Elimination of Maternal and Newborn Mortality. UNFPA.

Wang, M., et al. (2019). "Effectiveness of integrated psychosocial interventions for pregnant adolescents: A systematic review." *Maternal and Child Health Journal*, 23(6), 741-751.

Wangui, E., & Mwangi, A. (2022). "Addressing Teenage Pregnancy in Kenya: Challenges and Policy Interventions." *African Journal of Reproductive Health*, 26(3), 12-22. doi:10.29063/ajrh2022/v26i3.2.

WHO. (2011). "Global Strategy for Women's, Children's and Adolescents' Health (2016-2030)." World Health Organization.

WHO. (2011). "Youth-friendly health services: An evaluation of global practices and outcomes." *World Health Organization*. Retrieved from WHO.

WHO.World Health Organization (2021). Global Health Estimates: Maternal and Newborn Health.

WHO.World Health Organization. (2014). Adolescent pregnancy: Issues and interventions. Geneva: World Health Organization.

Wiley.Harris, A., Williams, C., & Brown, J. (2023). Transportation barriers to maternal health care in isolated Australian communities. *Australian Journal of Rural Health*, 31(2), 104-113.

Wiley.Hulley, S. B., Cummings, S. R., Browner, W. S., Grady, D., & Newman, T. B. (2013). *Designing Clinical Research* (4th ed.). Wolters Kluwer.

Williams, R., Brown, J., & Davis, J. (2022). Financial barriers to prenatal care among adolescents in the United States. *American Journal of Public Health*, 112(6), 823-832.

Williams, R., Brown, J., & Davis, J. (2022). Financial barriers to prenatal care among adolescents in the United States. American Journal of Public Health, 112(6), 823-832.

Williams, R., Brown, J., & Davis, J. (2022). Financial barriers to prenatal care among adolescents in the United States. American Journal of Public Health, 112(6), 823-832.

Williams, S., & Edwards, T. (2023). Evaluating interventions to improve transportation access for pregnant adolescents: A systematic review. Maternal and Child Health Journal, 27(4), 579-594.

Wilson, A., & Carter, R. (2024). Coping strategies among pregnant adolescents: Effectiveness and impact on emotional distress. *Journal of Pediatric Psychology*, *39*(2), 204-215.

WMA(2013). *Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects*. Retrieved from https://www.wma.net/what-we-do/medical-ethics/declaration-of-helsinki/

Wong, C., Jones, A., & Harrison, B. (2023). Marital status and psychosocial effects in adolescent pregnancy. *International Journal of Public Health*, 18(2), 23-35.

Wong, C., Jones, A., & Harrison, B. (2023). Marital status and psychosocial effects in adolescent pregnancy. *International Journal of Public Health*, 18(2), 23-35.

Wong, P., Turner, C., & Smith, D. (2023). Social stigma and its impact on adolescent pregnancy: A longitudinal study. *Social Science Research*, 89, 101-115.

World Health Organization (2014). *Adolescent Pregnancy*. WHO Fact Sheet. World Health

World Health Organization. (2018). Global health estimates: Life expectancy and leading causes of death. Geneva: World Health Organization.

World Health Organization. (2021). *COVID-19 and maternal health: A global perspective*. Geneva: World Health Organization.

World Health Organization. (2023). *Adolescent Health and Well-being: A Review of Evidence*. WHO Publications.

World Health Organization. (2023). *Research Methods for Health: A Practical Guide*. WHO Publications.

World Health Organization. (2023). *Sample Size Determination in Health Studies: A Practical Guide*. WHO Publications.

World Vision. (2020b). COVID-19 and its impact on vulnerable populations. [Online] Retrieved from [World Vision Reports].

Xia, Y., & Gong, X. (2015). Data Analysis for Research and Evaluation. Sage Publications.

Zhang, Y., & Nguyen, L. (2022). Longitudinal studies on transportation barriers and maternal health outcomes: A critical analysis. Journal of Public Health Research, 11(1), 76-88.

Zulaika, G., et al. (2021). "Understanding the persistence of adolescent pregnancies in developing countries: A review of recent evidence." *Global Health Action*, 14(1), 1908813.

Zulaika, L., Gámez, M., & Rodríguez, F. (2021). Global trends in adolescent pregnancies: A review of recent studies. International Journal of Public Health, 66, 1854387

APPENDIX I: CONSENT LETTER

Dear Respondent,

I am a student pursuing a PhD in Community Health & Development at Great Lakes University of Kisumu. One of the requirements of this course is to conduct research leading to the presentation of a thesis. I am currently in this process collecting data on my research topic: *Determination of the psycho social effects of adolescent on maternal utilization in Rongai Sub County, Nakuru County, Kenya.* It is said that it was with great gratitude that you were chosen to be the main interviewee for the study. Please answer the questions as truthfully as possible.

The results of this study will be used for academic purposes only.I ask for your intuitive cooperation and support. All information collected is treated with the utmost confidentiality.

Kind regards,

Daniel Atuke Otwori

PHD Candidate

APPENDIXII: PARTICIPANTSINFORMATION AND CONSENT FORM FOR ENROLMENT IN THIS STUDY

The study is an investigation of the Determinations of the psycho social effects of adolescent maternal utilization in Rongai Sub County, Nakuru County, Kenya.

My name is Daniel Atuke Otwori, a PhD Candidate in Community Health & Development at the Great Lakes University of Kisumu.

My Co investigators are:

1.Prof. Bernard Omondi Abongo, Faculty of Community Health & Development at Great Lakes University of Kisumu

2. Dr. Lubeka Agrippina , Director of Nairobi Campus of Great Lakes University of Kisumu

My Research Assistants are **:**

Names of investigators	**Gender**	**Qualification**	**Experience**
Sharon Omondi	*Female*	*BSN Nursing student*	*Research Assistant*
Brenda Kianira	*Female*	*BSN Nursing student*	*Research Assistant*
Linda Akinyi	*Female*	*Bachelor Student*	*Research Assistant*
Joshua Nyasuru	*Male*	*Bachelor CHD Student*	*Research Assistant*
Lawrence Akama	*Male*	*BSN Nursing*	*Research Assistant*

I would like to inform you about the study being conducted by the above researchers. The purpose of this consent form is to provide you with the information you need to decide whether or not to participate in the study. Just ask if you have any questions about the purpose of the study, what happens if you participate in the study, the potential risks and benefits, your rights as a volunteer, and anything else that is unclear about the research on this form if we all Have your questions answered You can decide to your satisfaction whether you want to participate in the study or not. This process is known as consent. Once you understand and agree to participate in the study, I will ask you to sign your name on this form. You should understand the general principles that apply to all participants in health research.

i. Your decision to participate in entirely voluntary

ii. You may withdraw from the study at any time without necessary giving a reason for your withdrawal

Refusal to participate in the research will not affect the benefits to which you are entitled at that healthcare facility or other facilities.

May I Continue ? YES / NO

This study has approval from Great lakes University of Kisumu Research Ethics Committee protocol Number……..

What is this study about?

The research assistants are interviewing pregnant adolescents, ages 15 to 19, who are performing their prenatal services at various health facilities in Rongai Sub County. The purpose of the interview is to examine the determinations of psycho social effects of adolescent pregnancy aged 15-19 years on maternal services utilization in Rongai Sub-County, Nakuru County, Kenya Participants in this research study will be asked questions about

a) Demographic characteristics

b) Socio demographic and psycho social determinants associated with optimal maternal services utilization among pregnant adolescents

c) The prevalence and severerity of psycho social effects experienced by pregnant adolescents

d) The association between psychosocial effects of adolescent pregnancy and the utilization of antenatal care (ANC) services among pregnant adolescents.

e) the perceived barriers and facilitators influencing maternal services utilization related to psychosocial factors among pregnant adolescents

Participants will also have the choice to have their weight taken.

There will be approximately 411 participants in this study purposively chosen. We are humbly requesting for your consent to be included in this study.

WHAT WILL HAPPEN IF YOU DECIDE TO BE IN THIS STUDY?

If you agree to participate in this study, the following things will happen

You will be interviewed by a trained interviewer in a private area where you will feel comfortable answering questions .The interview will last for about 10 minutes. The interview will cover Demographic characteristics , Socio demographic and psycho social determinants associated with optimal maternal services utilization among pregnant adolescents, the prevalence and severity of psycho social effects experienced by pregnant adolescents, the association between psychosocial effects of adolescent pregnancy and the utilization of antenatal care (ANC) services among pregnant adolescents, the perceived barriers and facilitators influencing maternal services utilization related to psychosocial factors among pregnant adolescents.

Procedure

You will be asked if you would like assistance in completing the questionnaire or if you would like to complete the questionnaire yourself. You will also be asked which language you prefer. You will receive a briefing with clear instructions on how to fill in the questionnaire. You have

about 10 minutes to answer the questionnaire and will give you the completed questionnaire after completion.

We will ask you for the phone number where we can contact you if necessary. If you agree to provide your contact information, it will only be used by the people working on this study and will never be shared with others. The reasons we may need them to contact you is to find out about the progress of the pregnancy.

Risk. The question included in this study don't present any foreseeable risk.

ARE THERE ANY BENEFITS OF BEING IN THIS STUDY?

You can benefit from receiving free pregnancy health information. We will refer you to other medical facilities for care and support as needed. Also, the information you provide will help us to better understand the psychosocial impact of teenage pregnancy. This information is a contribution to the science of reproductive health. You will not incur any costs or receive any remuneration for participating in this study. However, their participation enables the design and implementation of interventions to improve pregnancy in adolescents.

WHAT OF YOU HAVE QUESTIONS IN THE FUTURE?

If you have additional questions or concerns about participating in this study, please call or text the study staff at the number provided at the bottom of this page.

For more information about your rights as a research participant, you may contact the Secretary or Chair of the Great Lakes University of Kisumu Scientific and Ethical Review Committee. 07221433509 Email.ethicalreview@gluk.ac.ke

Study staff will pay your charges to these numbers if the call is for study-related communications.

WHAT ARE YOUR OTHER CHOICES?

Your decision to participate in this study is voluntary. You are free to refuse to participate in the study and you may withdraw from the study at any time without injustice or loss of benefit.

CONSENT FORM (STATEMENT OF CONSENT)

Participant's statement

I have read this consent form or had the information read to me. I had the opportunity to discuss this research study with a research assistant. My questions were answered in a language I understand. The risks and benefits have been explained to me. I understand that my participation in this study is voluntary and that I can withdraw at any time. I voluntarily consent to participate in this research study. I understand that every effort is made to keep information about my personal identity confidential. By signing this consent form, I am not waiving any of my statutory rights as a participant in a research study.

I agree to participate in this research study YES /NO

I agree to provide contact information for follow up YES/ NO

Participant's printed Name ……..

Participant's signature thumb stamp……..Date……..

I,The undersigned ,have fully explained the relevant details of this research study to the participant named above and believe that the participant has understood and have willingly and freely given his her consent.

Researcher's Name:……..Date……Signature……..

Role in the study: Research Assistant who explained the informed consent.

For more information contact Otwori Daniel Atuke at 0737114815 from 8.00am to5.00pm.

APPENDIX III CHILDREN CONSENT FORM

GREAT LAKES UNIVERSITY OF KISUMU

STUDIES INVOLVING CHILDREN

Sample Child Assent Form

NB/ *This sample is intended to help you create an assent document; the text here is a suggestion for how to introduce the required elements of an assent form in a way that is easy for a child to understand.*

Sample Minor Assent Document

(To be modified based on the age bracket)

Project Title: *Determinantion of psychosocial effects of adolescent pregnancy on maternal health services utilization in Rongai Sub County, Nakuru,Kenya*

Investigator(s):

1. Daniel Atuke Otwori, PhD Candidate, School of Community Health & Development Great Lakes University of Kisumu.

2.Prof. Bernard Odongo Abongo,Dean School of Community Health & Development Great Lakes University of Kisumu

We are doing a research study about *investigating the determinants of psychosocial effects of adolescent pregnancy on maternal services utilization in Rongai Sub County, Nakuru,Kenya*

Permission has been granted to undertake this study by the Great Lakes University of Kisumu scientific Ethics and Research Committee *(GLUKSERC Protocol No. No. GLUSERC /004/2023____*)

This research study is a way to learn more about people. At least__children will be participating in this research study with you.

If you decide that you want to be part of this study, you will be asked to (***description, including time involved).***

There are some things about this study you should know. These are (***procedures, things that take a long time, other risks, harms, discomforts, etc).***

Not everyone who takes part in this study will benefit. A benefit means that something good happens to you. We think these benefits might be (***description***.)

If you do not want to be in this research study, we will tell you what other kinds of treatments there are for you. (***This statement applies to research projects that offer treatment or intervention).***

When we are finished with this study we will write a report about what was learned. This report will not include your name or that you were in the study.

You do not have to be in this study if you do not want to be. If you decide to stop after we begin, that's okay too. Your parents know about the study too.

If you decide you want to be in this study, please sign your name.

I,_____, want to be in this research study.

_____ _____

(Signature/Thumb stamp) (Date)

Parts in Italics should be modified for your specific project. Other parts may need to be modified as well depending on your research methods

APPENDIX IV: QUESTIONNAIRE

I would like you to help me answer the following questions.

Instructions: Please do not enter your name anywhere in this questionnaire. All information provided will be treated confidentially.

PART I: DEMOGRAPHIC CHARACTERISTICS:

Kindly respond by ticking in the selected options

a. *What is your age?15..☐..16..☐...17.☐..18..☐.19☐..*
b. *What is your highest educational level:None ☐ Primary ☐ Secondary ☐ college ☐ University ☐*
c. *What is your religion:…Christian ☐ Muslim … ☐ others ☐*
d. *Are your parent alive: Yes ☐ No ☐*
e. *What's your marital status?.Married ☐ Single ☐.*
f. *Social economic status .Do you have any source of income?.Yes ☐ No ☐*
g. *Place of residence. Rural ☐ Urban ☐*
h. *Did you consider your pregnancy being planned Pregnancy? Yes ☐ No: ☐*
i. *What is the Gestation age of the current pregnancy (weeks)First Trimester ☐ Second Trimester ☐ Third Trimester ☐*
j. *Have you encountered stigma or discrimination related to your adolescent pregnancy? (Yes…☐No .☐*
k. *How many antenatal care (ANC) visits have you attended during your pregnancy? 0-2 ☐ 3-4 ☐ 5-6 ☐ 7-8 ☐*
l. *Have you utilized any support systems or resources specifically aimed at facilitating maternal services utilization during your pregnancy? Yes ☐ No: ☐*

PART II: VARIABLES

A. SOCIAL DEMOGRAPHIC AND PSYCHOCIAL DETERMINANTS OF MATERNAL SERVICES UTILIZATION

Kindly respond by ticking in the selected options

How would you rate the importance of each of the following sociodemographic factors in influencing your utilization of maternal services? Please rate each factor on a scale of 1 to 5, where:

1 = Not Important 2 = Somewhat Important 3 = Moderately Important 4 = Important 5 = Very Important

	A. SOCIAL DEMOGRAPHIC DETERMINANTS OF MATERNAL SERVICES UTILIZATION

No	*Statement*	*Not important*	*Somewhat important*	*Moderately important*	*Important*	*Very important*
1	*Age*					
2	*Marital status*					
3	*Education*					
4	*Social economic (Income)*					

B.PSYCHOCIAL DETERMINANTS OF MATERNAL SERVICES UTILIZATION

Kindly respond by ticking in the selected options

How would you rate the importance of each of the following psychosocial factors in influencing your utilization of maternal services? Please rate each factor on a scale of 1 to 5, where:

1 = Not Important 2 = Somewhat Important 3 = Moderately Important 4 = Important 5 = Very Important

	B. PSYCHOSOCIAL DETERMINANTS OF MATERNAL SERVICES UTILIZATION					
No	***Statement***	***Not important***	***Somewhat important***	***Moderately important***	***Important***	***Very important***
1	*Perceived social support*					
2	*Cultural beliefs & practices related to pregnancy & child birth*					
3	*Psychological factors as anxiety or depression*					
4	*Previous experience with healthcare services*					
5	*Knowledge & awareness about*					

	maternal health services					
6						

A. PREVALENCE AND SEVERITY OF PSYCHOSOCIAL EFFECTS EXPERIENCED BY PREGNANT ADOLESCENTS

. ***.****On a scale of 1 to 5, please rate the severity of depression symptoms you have experienced during your pregnancy, where: 1 = Not at all 2 =mild 3=mild 4 =Extremely severe, 1=Rarely, 2=Sometimes,3= Often, 4=Always ,1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree; 1=Daily ,2-weekly ,3=Monthly,4= Occasionally 5=Never*

	PREVALENCE AND SEVERITY OF PSYCHOSOCIAL EFFECTS EXPERIENCED BY PREGNANT ADOLESCENTS					
No	***Statement***	***Not at all***	***Mild***	***Moderately***	***Severe***	***Extremely severe***
1	*Severity of depression*					
2	*Please rate the severity of stigma or discrimination you have experienced*					
3	*Overall, how would you rate the severity of psychosocial affects you have experienced during your pregnancy?*					
4	*How often do you experience feelings of anxiety related to your pregnancy*	***Never***	***Rarely***	***Sometime***	***Often***	***Always***
5	*To what extent do you agree with the statement: "I feel socially isolated or lonely during*	***Strongly disagree***	***Disagree***	***Neutral***	***Agree***	***Strongly agree***

	my pregnancy"?					
6	*How frequently do you engage in activities or hobbies that help you cope with psychosocial stressors during your pregnancy? (*	***Daily***	***Weekly***	***Monthly***	***Occasionally***	***Never***
7	*How satisfied are you with the support you receive from family and friends in managing psychosocial effects during your pregnancy?*	***Very dissatisfied***	***Dissatisfied***	***Neutral***	***Satisfied***	***Very satisfied***
8	*How likely are you to seek professional help or counseling for psychosocial concerns related to your pregnancy?*	***Not likely at all***	***Slightly likely***	***Moderately likely,***	***Very likely***	***Extremely likely***
9	*Please rate your overall well-being during your pregnancy.*	***Poor***	***Fair***	***Average***	***Good***	***Excellent***

C: PSYCHOSOCIAL FACTORS INFLUENCING MATERNAL SERVICES UTILIZATION

How would you rate the importance of each of the following psychosocial factors in influencing your utilization of maternal services? Please rate each factor on a scale of 1 to 5, where: 1 = Not Important 2 = Somewhat Important 3 = Moderately Important 4 = Important 5 = Very Important

	PSYCHOSOCIAL FACTORS INFLUENCING PREGNANT ADOLESCENTS `MATERNAL SERVICES UTILIZATION					
No	***Statement***	***Not important***	***Somewhat important***	***Moderately important***	***Important***	***Very important***
1	*Family support*					
2	*Peer influence*					
3	*Mental Health*					
4	*Stigma & Social norms*					
5	*Educational attainment*					
6	*Social Economic status (Income)*					
7	*Cultural beliefs & Practices*					

C: BARRIERS TO MATERNAL SERVICES

Please rate the extent to which each of the following factors has acted as a barrier to your utilization of maternal services on a scale of 1 to 5, where:

- *1 = Strong Barrier*
- *2 = Barrier*
- *3 = Neutral*
- *4 = Facilitator*
- *5 = Strong Facilitator*

	BARRIERS TO PREGNANT ADOLESCENTS `MATERNAL SERVICES UTILIZATION					
No	***Statement***	***Not important***	***Barrier***	***Neutral***	***Facilitator***	***Strong Facilitator***

1	*Transportation*					
2	*Cost of Services,*					
3	*Stigma*					
4	*Healthcare Provider Attitudes*					
5	*Knowledge about Available services*					

1. *Frequency of Barriers:*
    - *How frequently have you encountered each of the following barriers in accessing or utilizing maternal healthcare services during your pregnancy? (1-Rarely, 2-Sometimes, 3=Often, 4-Always)*

	FREQUENCY OF BARRIERS ON PREGNANT ADOLESCENTS `MATERNAL SERVICES UTILIZATION					
No	***Statement***	***Rarely***	***Sometimes***	***Often***	***Always***	
1	*Lack of transport*					
2	*Inability to Afford Services*					
3	*Fear of Stigma*					

D: FACILITATORS TO PREGNANT ADOLESCENTS `MATERNAL SERVICES UTILIZATION

Please rate the extent to which each of the following factors has acted as a facilitator to your utilization of maternal services on a scale of 1 to 5, where:

- *1 = Strong Barrier*
- *2 = Barrier*
- *3 = Neutral*

- *4 = Facilitator*
- *5 = Strong Facilitator*

	FACILITATORS TO PREGNANT ADOLESCENTS `MATERNAL SERVICES UTILIZATION					
No	***Statement***	***Strong Barrier***	***Barrier***	***Neutral***	***Facilitator***	***Strong facilitator***
1	*Family support*					
2	*Access to Transportation,*					
3	*Knowledge about Available Services*					
4	*Supportive Healthcare Providers*					

1. ***FREQUENCY OF FACILITATORS:***
    - *How frequently have you utilized each of the following facilitators in accessing or utilizing maternal healthcare services during your pregnancy? (Rarely, Sometimes, Often, Always)*

	FREQUENCY OF FACILITATOS ON PREGNANT ADOLESCENTS `MATERNAL SERVICES UTILIZATION					
No	***Statement***	***Rarely***	***Sometimes***	***Often***	***Always***	
1	*Family support*					
2	*Access to Transportation,*					
3	*Knowledge about Available Services*					
4	*Supportive Healthcare Providers*					

2.IMPACT OF FACILITATORS:

On a scale of 1 to 5, please rate the impact of these facilitators on your overall utilization of maternal services, where:

1 = No Impact

2 = Minor Impact

3 = Moderate Impact

4 = Significant Impact

5 = Very Significant Impact

	IMPACT OF FACILITATORS ON PREGNANT ADOLESCENTS `MATERNAL SERVICES UTILIZATION					
No	***Statement***	***No impact***	***Minor impact***	***Moderate impact***	***Significant***	***Very significant***
1	*Family support*					
2	*Access to Transportation,*					
3	*Knowledge about Available Services*					
4	*Supportive Healthcare Providers*					

3: SATISFACTION WITH SUPPORT SYSTEMS:

How satisfied are you with the current support systems available to facilitate pregnant adolescents' access to and utilization of maternal healthcare services in your community? (Scale of 1 to 5)Where:

1 "Very Dissatisfied"

2"Dissatisfied"

3"Neutral"

4"Safisfied"

5"Very Satisfied"

	SATISFACTION WITH SUPPORT SYSTEMS ON PREGNANT ADOLESCENTS `MATERNAL SERVICES UTILIZATION					
No	***Statement***	***Very Dissatisfied***	***Dissatisfied***	***Neutral***	***Safisfied***	***Very Satisfied***
1	*Family support*					
2	*Access to Transportation,*					
3	*Knowledge about Available Services*					
4	*Supportive Healthcare Providers*					

1. *Have you utilized any support systems or resources specifically aimed at facilitating maternal services utilization during your pregnancy? Yes* ☐ *No:* ☐

Suggestions for Further Enhancement:

2. *What changes or improvements would you suggest to further enhance the facilitators available to pregnant adolescents in accessing and utilizing maternal services in your community?*

3. PART III: KEY INFORMANT INTERVIEW FOR PREGNANT ADOLESCENTS AGED 15-19 YEARS

This key informant interview is to facilitate the collection of data for academic purposes.

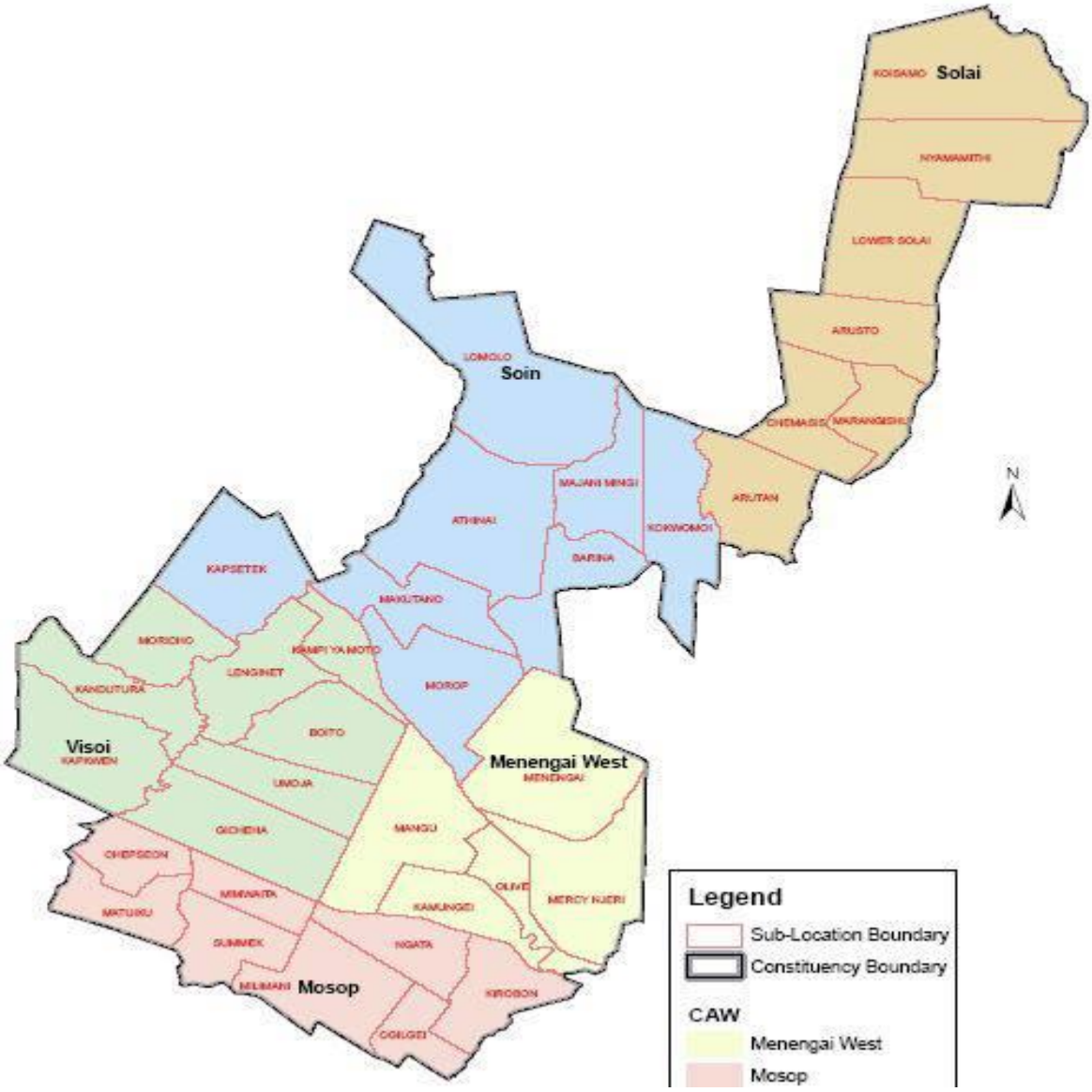
PART II: VARIABLES

UTILIZATION OF MATERNAL HEALTH SERVICES

1. *What factors influenced your decision to seek or delay seeking antenatal care?*
2. *Can you identify any specific barriers or challenges you encountered in accessing antenatal care services?*
3. *What kinds of support have you received from family, friends, or community members during your pregnancy?*
4. *Are there any resources or support systems available to pregnant adolescents that you believe could be improved or expanded to enhance maternal services utilization?*
5. *Based on your knowledge and experiences, what do you believe could be done to improve maternal services utilization among pregnant adolescents, particularly in addressing psychosocial factors*

THANK YOU FOR YOUR COOPORATION.

APPENDIX V: MAP RONGAI SUB COUNTY,NAKURU .KENYA



APPENDIX VI:RESEARCH PROTOCAL APPROVAL CERTIFICATE -GLUSERC

GREAT LAKES UNIVERSITY OF KISUMU (GLUK)

P. O. Box: 2224-40100 KISUMU, Tel: 254-057-2023972

Email: ethicalreview@gluk.ac.ke

Certificate of Approval of Research Protocol
GLUK Scientific and Ethical Review Committee (GLUSERC)
Ref: No. GLUSERC /004/2023

To: Otwori Daniel Atuke – Principal Investigator

Date: 14th August, 2023

TITLE: AN EXPLORATION STUDY ON THE PSYCHOSOCIAL EFFECTS OF ADOLESCENT PREGNANCIES IN RONGAI SUB COUNTY, NAKURU COUNTY, KENYA.

The Great Lakes University Scientific and Ethics Review Committee (GLUSERC) has reviewed the above titled research project, including associated documentation noted below, and finds the research project acceptable on ethical grounds for research involving human subjects and hereby grants ethics approval.

This approval applies to research ethics issues only. The approval does not obligate an institution or any of its departments to proceed with activation of the study. The Principal Investigator for the study is responsible for identifying and ensuring that resource impacts from this study on any institution are properly negotiated, and that other institutional policies are followed. GLUSERC assumes that investigators continuously review new information for findings that indicate a change should be made to the protocol, consent documents or conduct of the trial and that such changes will be brought to the attention of the GLUSERC in a timely manner.

Documents included in this approval are:
1. Protocol Version 2.
2. Informed Consent Form version 1.

Note that all applications/ re-submissions should reach the GLUSERC Secretary two weeks before the next scheduled meeting. Ordinary meetings are held **EVERY FIRST MONDAY of the month** .All approvals are valid for one year and renewals must be obtained for any period from time beyond the year.

Thank you.

Sincerely,

GLUSERC:

CHAIR, or CO-CHAIR or **SECRETARY**

APPENDIX VIII: RESEARCH LICENCE- NACOSTI/P/23/288833

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **962198**

Date of Issue: **25/August/2023**

RESEARCH LICENSE

This is to Certify that Mr.. Daniel Atuke Otwori of Great Lakes University of Kisumu, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nakuru on the topic: AN EXPLORATION STUDY ON THE PSYCHOSOCIAL EFFECTS OF ADOLESCENT PREGNANCIES IN RONGAI SUB COUNTY, NAKURU COUNTY, KENYA for the period ending : 25/August/2024.

License No: **NACOSTI/P/23/28833**

962198

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

APPENDIX IX: RESEARCH AUTHORIZATION NAKURU COUNTY

DEPARTMENT OF HEALTH SERVICES

NAKURU COUNTY

Email: info.health@nakuru.go.ke

COUNTY DIRECTOR, PUBLIC HEALTH
NAKURU COUNTY
P.O BOX 2060-20100
NAKURU

REF: NCG/CDPH/RES/VOL.1/2023/913

3rd October, 2023

To
The Sub County Team Lead
RONGAI

RE: RESEARCH AUTHORISATION
OTWORI DANIEL ATUKE

The above named is a student at Great Lakes University Kisumu. This letter serves as an authorization from the County Department of Health Services Nakuru for him to conduct research in Rongai Sub County on the topic ***"An exploration study on the psychosocial effects of adolescent pregnancies in Rongai Sub County, Nakuru County, Kenya."***

The study should be in line with ethical consideration and approved study protocol.

Accord him the necessary support.

COUNTY DIRECTOR
PUBLIC HEALTH & SANITATION
NAKURU COUNTY
P.O. Box 2060-20100,
NAKURU

ELIZABETH KIPTOO
Ag. COUNTY DIRECTOR, PUBLIC HEALTH
NAKURU

C.C:

- Otwori Daniel Atuka

APPENDIX: X WORK PLAN

Activity	*OCT-DEC2020*	*JAN-APRIL 2021*	*MAY - AUG 2021*	*SEPT2021 – APRIL2022*	*APRIL-DEC 2022*	*AUG 2023*
Concept paper Writing submission.						
Literature review, Proposal writing, tool design						
Proposal defense & Pilot study						
Field work, Data entry, collection and analysis						
Report writing, proof reading, submission & defense						
Graduation						

APPENDIX XI: BUDGET

Activities	***Amount (Ksh)***
Transport, subsistence and communication	*31,000*
Internet costs & proof-reading services	*10,000*
Seminar presentation & journal publication costs	*30,000*
Printing, Photocopy, Typesetting & bindings	*24,000*
Purchase of a laptop, printer	*60,000*
Data collection *-Research assistants training & allowances*	*35,000*
Data analysis *Statistician*	*20,000*
Contingencies	*23,000*
Total	***233,000***