

FACTORS CONTRIBUTING TO PRENATAL STRESS AMONG PREGNANT  
WOMEN ATTENDING SELECTED ANTENATAL CLINICS IN NAIROBI  
COUNTY

by

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A thesis presented to the School of Applied Human Sciences

of

Daystar University  
Nairobi, Kenya

In partial fulfilment of the requirements for the degree of

MASTER OF ARTS  
in Counselling Psychology

October 2023

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FACTORS CONTRIBUTING TO PRENATAL STRESS AMONG PREGNANT  
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DECLARATION

FACTORS CONTRIBUTING TO PRENATAL STRESS AMONG PREGNANT  
WOMEN ATTENDING SELECTED ANTENATAL CLINICS IN NAIROBI  
COUNTY

I declare that this thesis is my original work and has not been submitted to any other college or university for academic credit.

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## ACKNOWLEDGEMENTS

First and foremost, I would like to express my sincere gratitude to our almighty God for giving me wisdom, strength, and ability to complete this research thesis. It is all by His grace.

I would also like to express my sincere gratitude to my supervisors, Dr. Winnie Waiyaki and Dr. Naomi James, for their continuous support in writing this thesis. I appreciate them for their patience, motivation, and immense knowledge. It was a long tough journey walking together, without their help; I would not have been able to complete the study.

I could not forget my classmates who used to call me now and then to find out how far I was. The Gunzo platform, which was created by Chris Lymo, allowed classmates to discuss challenges, solutions, and progress. My third objective was first mentioned in the platform. Thank you Chris, and all the experts you invited; you were of great help. Mary Ogutha was another great friend who always reminded me that it was doable.

Finally, I would like to thank members of my family, especially my mother who has been very supportive to the extent of staying with me until late at night while I worked on this research thesis. God bless everyone who touched my life through this thesis.

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## LIST OF ABBREVIATIONS AND ACRONYMS

ANC	Antenatal care
ACOG	American College of Obstetricians & Gynaecologist
GAS	General Adaptation Syndrome
USA	United States of America
GOK	Government of Kenya
IUGR	Intrauterine Foetal Growth Retardation
KDHS	Kenya Demographic Health survey
KHIS	Kenya Health Information System
MDG	Millennium Growth Development Goal
MOH	Ministry Of Health
NACOSTI	The National Commission for Science, Technology and Innovation
SPSS	Statistical Package for the Social Sciences
Perceived Stress Scale 10 (PSS 10)	
UNICEF	The United Nations Children's Fund
WHO	World Health Organization
IPV	Intimate Partner Violence

## ABSTRACT

Globally, preterm birth is the most common problem in pregnancy, and prenatal stress, though preventable, is the most common cause of this problem. Prenatal stress is not assessed during routine antenatal care (ANC) visits. The purpose of this study was to investigate factors contributing to prenatal stress among pregnant women attending selected ANC clinics in Nairobi County. The objectives of the study were to determine the prevalence of prenatal stress, investigate factors contributing to prenatal stress among pregnant women, and analyse the relationship between factors contributing to prenatal stress and demographic data. The study was guided by the general adaptation syndrome (GAS) and the transactional model of stress and coping theories. The sample size was 274 pregnant women. Purposive and simple random sampling techniques were used to select two level three hospitals included in the study. Stratified and systematic sampling techniques were used to get the desired sample size. The study employed a quantitative cross-sectional research design. A Perceived Stress Scale 10 (PSS 10) questionnaire was the data collection instrument and data analysis was done using the Statistical Package for the Social Sciences (SPSS), version 25. The key findings of the study indicated that the prevalence of prenatal stress was 48.9%. Factors contributing to prenatal stress were unplanned pregnancy, intimate partner violence (IPV), lack of social support, and stressful life events. There was a weak positive and negative relationship between factors contributing to prenatal stress and demographic data. The study recommends assessment of prenatal stress done during routine ANC clinic. All ANC clinics should have professional counsellors. Further, it is recommended that pregnant women should be educated about effects of prenatal and stress management skills. Male involvement should be encouraged during the care of a pregnant woman.

## CHAPTER ONE

### INTRODUCTION AND BACKGROUND TO THE STUDY

#### Introduction

Chapter one gives a brief introduction, detailed background, problem statement, objectives, research questions, justification, purpose, and significance of the study. It presents both the geographical and academic scope of the study. The chapter also covers the study's assumptions and limitations and delimitations. Moreover, definitions of key terms to be used in the study will be presented to show how the terms will be used in the context of the study.

Prenatal stress refers to when an expectant woman experiences an imbalance in dealing with worries and demands she encounters during pregnancy (Engidaw et al., 2019). It is associated with adverse birth outcomes such as prematurity, intrauterine foetal growth retardation (IUGR), low birth weight (less than 2500grams), high neonatal mortality, and morbidity rate (Gangadharan & Jena, 2019; Lilliecreutz et al., 2016). Prenatal stress is underdiagnosed during routine antenatal care (ANC) clinics because it is not assessed during the visits (Shosha, 2016). This study investigated factors contributing to prenatal stress among pregnant women attending selected ANC clinics in Nairobi County. Understanding the factors contributing to prenatal stress and its magnitude among pregnant women might give health workers evidence-based reasons to assess prenatal stress during routine ANC visits and develop risk-specific strategies for managing prenatal stress.

#### Background to the Study

Pregnancy is a new stage of life for a woman, which gives the woman the name "mother." This brings about some biological, psychological, and family status

changes. These changes make most women suffer from mental disorders of different types and degrees, and prenatal stress is the most common of these disorders (Tang et al., 2019). Prenatal stress occurs when a pregnant woman experiences disharmony in dealing with the worries and demands she encounters during pregnancy (Engidaw et al., 2019). A woman suffering from prenatal stress can have the following signs and symptoms: high pulse rate, palpitations, high blood pressure, anorexia, lack of concentration, withdrawal, and hypervigilance.

As attested by Gangadharan and Jena (2019), prenatal stress is one of the contributing factors to poor birth outcomes, including preterm birth, low birth weight, increased susceptibility to illness, and increased death rate. An increase in prenatal stress contributes to vascular disorders such as hypertension and pre-eclampsia, which are the major causes of preterm births. Prenatal stress also leads to unhealthy behaviour, for instance, poor diet or nutrition, taking alcohol, and smoking, which are also contributing factors to preterm births (Yonkers et al., 2014). Studies conducted in high-income countries such as the United States of America (USA) and Canada have shown that psychological stress is associated with preterm births and low birth weight (Schetter, 2011; Schetter & Tanner, 2012).

There are several studies done to show that prenatal stress is a contributing factor to preterm births. According to Walsh et al. (2019), in a study done in America, preterm birth increased in pregnant women who have experienced stressful situations such as intimate partner violence (IPV), lack of social support, and unplanned pregnancies. A retrogressive study done at Linköping University Hospital in Sweden found that prenatal stress was twice more common in women who gave birth to preterm babies than those who gave birth to term babies. The study concluded that 20% of women who gave birth to preterm babies were exposed to maternal stress

during pregnancy (Lilliecreutz et al., 2016). In a systematic review done by Pias and Pia (2018), all 14 studies reviewed revealed that an increase in prenatal stress is associated with prematurity and preterm delivery. All these studies have shown that prenatal stress is a significant contributor to preterm births.

Preterm birth is the most common complication in pregnancy worldwide, and prenatal stress, though preventable, is the most prevailing cause of this problem (Tanpradit & Kaewkiattikun, 2020). Preterm is defined as babies born alive before 37 weeks gestation (World Health Organization [WHO], 2018). As noted by Keller et al. (2010), preterm birth is the major predisposing factor for neonatal mortality and morbidity; preterm deaths account for 63% of all deaths in children under five years in the world. Globally, preterm birth prevalence ranges between 5% and 18% across 187 countries, and every year, approximately 15 million babies are born prematurely, which is more than one in 10 babies (WHO, 2018). According to Liu et al. (2016), an estimated one million children die annually due to complications of preterm births, and those who survive suffer permanent disabilities, including learning, visual, respiratory, and auditory problems. In low- and mid-income countries such as Brazil and Bangladesh, there is a significant neonatal mortality rate associated with preterm birth and low birth weight (Premji, 2014).

Sub-Saharan Africa and Asia have the highest rate of preterm births, which accounts for half of the world's births. More than 60% of the world's preterm babies and over 80% of the world's 1.1 million neonatal deaths annually are due to complications related to preterm births (WHO, 2012). As attested by Wagura et al. (2018), preterm babies born in Africa are 12 times more likely to die of complications than those born in Europe. In Kenya, 193,000 babies are born preterm per year, and 13,300 children under five die due to preterm complications (Every Premie Scale

2017). Preterm births necessitate prolonged hospitalization and advanced care. Some babies also require long-term specialized care, which heightens the financial burden on the country, health institutions, and the family (Okube & Sambu, 2017).

There are several causes of preterm births, for example, multiple pregnancies, antepartum haemorrhage, excessive or insufficient amniotic fluid, low maternal body mass index, obesity, pre-eclampsia, and hypertension, among others (Lilliecreutz et al., 2016). Some diseases during pregnancy such as malaria, diabetes, German measles, and anaemia also predispose pregnant women to preterm births. In spite of this, Wagura et al. (2018) stated that half of the preterm birth cases are idiopathic - they have no exact known cause - and if the pregnant women at risk can be identified, risk-specific interventions can be implemented.

The prevalence of prenatal stress among pregnant women is evident in many studies. Boekhorst et al. (2021) observed that the prevalence of prenatal stress varies from 5.5% to 78%. A study done by Deo et al. (2020) revealed that the prevalence of prenatal stress among Iranian women was 91.89%. Another study done among Malaysian pregnant women showed a prevalence of 75% (Keramat et al., 2021). In Africa, the prevalence of prenatal stress among Ghanaian women was 28.6% (Boakye-Yiadom et al., 2015). This was comparable to a study done in Ethiopia, which showed a prenatal stress prevalence of 23.1% (Deksisa et al., 2020). On the other hand, a study done by Engidaw et al. (2019) in Bale Zone Hospital in Southeast Ethiopia among pregnant women established a prevalence of 11.6%. Andhavarapu et al. (2021) conducted research in the Migori rural part of Kenya and found that the prevalence of prenatal stress was 75.4% in pregnant women who experienced IPV.

Different factors contribute to prenatal stress in a pregnant woman. According to Vijayaselvi et al. (2015), in a study done in India, some of the significant factors

that contribute to prenatal stress were lack of social support, domestic violence, and stressful life events. Mediating factors or maternal characteristics, for instance, maternal age, level of education, and parity, also contribute to a high level of prenatal stress, as per a study done in the UK (Barton et al., 2017). In Ethiopia, Africa, Engidaw et al. (2019) noted that unplanned pregnancy, lack of social support, and domestic violence were some of the factors that contributed to high levels of prenatal stress. Research done by Andhavarapu et al. (2021) showed that some of the determinants of stress among pregnant women in Migori County, a rural part of Kenya, were parity, maternal age, household income, and IPV.

Provision of essential intervention during the antenatal period can enhance a pregnant woman's and infant's well-being. Although several institutions and organizations are involved in the development of antenatal packages, unfortunately, such packages exclude maternal stress assessment (Shosha, 2016). As attested by the WHO (2016), antenatal guidelines should include a physiological assessment of the mother (physical exam, lab tests, blood pressure, and provision of iron and folic supplements, among others), fetal assessment (fundal height, fetal heart, and obstetric ultrasound), and health education on danger signs and nutrition. Nevertheless, the guideline, which is used in all Kenyan health institutions, lacks prenatal stress assessment, thus underdiagnosis of the condition during routine ANC clinic. The American College of Obstetricians and Gynecologists (ACOG, 2006) noted that maternal stress was a significant cause of preterm birth, leading to the inclusion of prenatal stress screening once in a trimester in the guidelines for obstetric practice in America.



### Statement of the Problem

Prenatal stress is a common mental health problem in pregnancy due to social and psychological changes that occur during pregnancy (Tang et al., 2019). Prenatal stress, although preventable, is one of the most significant causes of preterm birth as shown by many studies (Lilliecreutz et al., 2016; Pias & Pias 2018; Tanpradit & Kaewkiattikun, 2020). Globally, approximately 15 million babies are born preterm every year, which is more than one in ten babies, whereas, an estimated one million children die each year due to complications of preterm births (Liu et al., 2016).

As attested by the WHO (2018), preterm babies who are survivors are likely to face lifetime challenges including learning disabilities and respiratory, visual, and hearing problems. Preterm babies require prolonged hospitalization and advanced care, some also require long-term specialized care, which escalates financial burden to the country, hospital, and family. It is estimated that in Kenya, 12.3% of births are preterm, making it to be ranked 48th globally. Furthermore, preterm birth is the highest cause of death in children under five, accounting for 13,300 deaths per year (WHO, 2012). This is a hindrance to the achievement of sustainable development goal 3.2, which aims at ending preventable deaths of neonates and under-fives.

Despite prenatal stress being an important cause of preterm birth, it remains undiagnosed during routine ANC visits. According to Shosha (2016), the provision of essential intervention during the antenatal period can enhance the well-being of both the pregnant woman and the infant. Antenatal packages are developed by several institutions and organizations but they, unfortunately, exclude assessment of prenatal stress. The ANC guideline, developed by WHO (2016), is used by many health institutions to give standardized care to all pregnant women, however, the guideline omits prenatal stress assessment. In the same guideline, on the 49th ANC

recommendation, health care providers who are trained in first-line response to IPV are advised to ask a pregnant woman about IPV. This shows that not all pregnant women are asked about IPV and other contributors to prenatal stress. Asking cannot give the psychological status of these women, revealing possibilities of missed opportunities. Moreover, the guideline does not have a tool to measure the psychological status of pregnant women.

A study done in Migori County, a rural part of Kenya, by Andhavarapu et al. (2021), revealed that pregnant women who experienced IPV had a prenatal stress prevalence of 75.4%. Regardless of this high prevalence, prenatal stress is still under diagnosed in Kenyan health institutions. There are limited studies done on factors contributing to prenatal stress among pregnant women. This study investigated factors that contribute to prenatal stress among pregnant women in selected ANC clinics in Nairobi County, which might give health care providers evidence-based reasons to include prenatal stress assessment in the ANC package. They can also come up with risk-specific management of prenatal stress to improve maternal and foetal outcomes.

#### Purpose of the Study

The purpose of this study was to investigate factors contributing to prenatal stress among pregnant women in selected ANC clinics in Nairobi County.

#### Objectives of the Study

1. Determine the prevalence of prenatal stress among pregnant women attending selected ANC clinics in Nairobi County.
2. Investigate factors that contribute to prenatal stress among pregnant women attending selected ANC clinics in Nairobi County.

3. Analyse the relationship between factors contributing to prenatal stress and demographic data of pregnant women attending selected ANC clinics in Nairobi County.

#### Research Questions

1. What is the prevalence of prenatal stress among pregnant women attending selected ANC clinics in Nairobi County?
2. What are the factors that contribute to prenatal stress among pregnant women attending selected ANC clinics in Nairobi County?
3. What is the relationship between factors contributing to prenatal stress and demographic data of pregnant women attending selected ANC clinics in Nairobi County?

#### Justification for the Study

Prenatal stress is the most common mental health problem during pregnancy (Engidaw et al., 2019). An increase in prenatal stress among pregnant women has a significant relation with adverse outcomes such as preterm births, low birth weight, IUGR, susceptibility to illnesses, and high neonatal death rate (Pais & Pai, 2018). Preterm babies require prolonged hospitalization and advance care, some may also need long-term specialized care, which increases monetary burden on the family. According to WHO (2012), prenatal births are the highest cause of death among children under five years in Kenya. Sustainable Development Goals target 3.2 aims at ending preventable deaths of neonates and children who are under five, as noted by WHO (2017), and preterm births are one of the barriers to attaining this goal.

The ANC package in Kenya lacks prenatal stress assessment, leading it to be underdiagnosed during routine ANC visits. There are also limited studies done on

factors contributing to prenatal stress in pregnant women in Kenya. This study aims to investigate factors contributing to prenatal stress among pregnant women so that risk-specific management of prenatal stress can be formulated.

#### Significance of the Study

The results of this study may give healthcare providers an understanding of factors contributing to prenatal stress among pregnant women so that risk-specific interventions can be implemented to improve both maternal and foetal outcomes. The study results would be used by health workers in health facilities as significant evidence to include prenatal stress assessment in their ANC package. Furthermore, the results may help mothers found to have a high level of prenatal stress to receive treatment, leading to improvement of their health and that of their unborn babies.

#### Assumptions of the Study

In this study, it was assumed that pregnant women in ANC clinics in Nairobi County had experienced prenatal stress, which was found to be true. After explaining to the respondents the purpose and significance of the study and assuring them of confidentiality, they participated and responded honestly, as per the assumption that they would do so. The study assumed that the Nairobi County government research authorization committee would accept the request for the study to be done in the selected level three hospital. The study also made the assumption that permission to access respondents in the selected ANC clinics from the sub-county heads, facility in-charges, and antenatal clinic in-charges would be granted.

#### Scope of the Study

Nairobi is the capital city of Kenya; it is in the south-eastern part of Kenya and covers an area of 700 Km<sup>2</sup>. It borders Kiambu County, Machakos County, and

Kajiado County. Nairobi County has over 119 health facilities, which are under the Nairobi County government. These (health facilities) are three county referral hospitals (level four hospitals), 58 health centers (Level three), and 58 dispensaries (level two hospitals). Nairobi County has a catchment population of 4,397,073, as per the 2019 census [Government of Kenya] (GOK 2020). Hospitals in Nairobi County also give services to clients and patients from neighbouring counties including Machakos, Kiambu, and Kajiado, making the hospitals very busy.

All the health facilities in Nairobi County have ANC clinics. In level four hospitals, majority of pregnant women who attend these facilities are referrals from level three or two facilities. ANC clinics in level two hospitals attend to a few number of pregnant women. On the other hand, majority of pregnant women receive routine ANC services for free in level-three hospitals. Therefore, the researcher chose to conduct the study in level three hospitals and opted not to include women who were below 20 weeks gestation. This is because some women may have just discovered they are pregnant, thus they might not be able to explain the reactions and treatment they might get from their intimate partners.

The scope of the study was limited to recruiting 288 pregnant women who were attending routine ANC clinics in two selected level three hospitals with over 700 ANC clients in Nairobi County. The two selected level three hospitals were Makadara Health Centre and Mathare North Health Centre. The recruitment lasted for two weeks and ended when 288 respondents were recruited.

#### Limitations and Delimitations of the Study

Limitations are prospective weaknesses that are out of a researcher's control (Theofanidis & Fountouki, 2018). In this study, the researcher used a self-administered questionnaire in the English language, making it limited to respondents

who could read and understand English. In response, the questionnaire was translated into Kiswahili without changing its original meaning.

Some respondents were not willing to participate in the study and might withhold sensitive information. The researcher sensitized them on the purpose of the study, the benefits of the study, and confidentiality. They were also assured that the information given during the study would only be used for research purposes. Respondents agreed to participate and gave honest responses.

#### Definition of Terms

**Antenatal care:** This is the care given to a woman during pregnancy till the end of the pregnancy (WHO, 2016). The same meaning was adopted in this study.

**Emancipated minor:** A person below the legal age (18 years) but has assumed adult responsibility such as self-support, marriage, or procreation, who, after demonstrating a good understanding of research requirements can make an independent decision to participate in research (Kenya Medical Research Institute [KEMRI] (2016). The same meaning was maintained in this study.

**Grand multipara:** Refers to a woman who has had over 5 pregnancies (Pillitteri, 2014). The study used the same meaning.

**Low birth weight:** This refers to babies whose weight at birth is less than 2,500 grams (WHO, 2018). The term was used in the same context in this study.

**Primigravida:** A woman who is pregnant for the first time (Pillitteri, 2014). The study adopted the same definition.

**Multipara:** According to Pillitteri (2014), multipara refers to a pregnant woman in her 2nd to 5th pregnancy. The same meaning was maintained in this study.

Parity: This is the number of pregnancies a woman has carried regardless of the outcome, which can either be a primigravida, multipara, or grand multipara (Pillitteri, 2014). The same definition was used in the study.

Prenatal stress: As defined by Engidaw et al. (2019), prenatal stress is when an expectant woman experiences an imbalance in dealing with worries and demands encountered during pregnancy. This study adopted the same definition.

Preterm birth: Refers to the delivery of a live baby before 37 weeks gestation (WHO, 2018). The same meaning was maintained in this study.

Sick pregnant woman: In this study, a sick pregnant woman is a pregnant woman with a medical or obstetric condition such as eclampsia, hypertension, preterm labour, antepartum haemorrhage, premature rupture of membrane, diabetes in pregnancy, and malaria in pregnancy, among others.

### Summary

The chapter has given an overview of the concepts of the study. The introduction and background of the study presented an understanding of the study's premise. The problem statement revealed a clear explanation of the knowledge gap found by the study. The chapter also contained the study's research objectives and questions, significance, justification, and operational definition of key terms.

## CHAPTER TWO

### LITERATURE REVIEW

#### Introduction

The chapter reveals the key theories used in the study. It contains a review of general literature relevant to the study to provide a description, summary, and critical evaluation of the issues in this study. The empirical literature review unveiled a description of the studies conducted and their findings that support the current study. The entire discussion was guided by the study objectives. A conceptual framework was also used to show the association between the independent, intervening, and dependent variables.

#### Theoretical Framework

The general adaptation syndrome (GAS) was the first theory to be used in this study. GAS reveals the physiological changes that occur in a pregnant woman when exposed to stress. The second theory employed is the transactional model of stress and coping, which captures the cognitive aspect of prenatal stress in a pregnant woman.

#### General Adaptation Syndrome

The GAS is a stress theory that was formulated by Hans Selye, who was known as “the father of stress research.” He described stress as a “nonspecific response of the body to any demand” (Tan & Yip, 2018). In his research using rats in a laboratory, he noted three things: first was how stress directly affects a living organism, second was how internal tissues create a defence against damaging threats, and the third one was what happens when the internal tissues surrender by preventing unnecessary or uncontrollable defence (Selye, 1979). In the experiment, Selye



discovered that stress was constantly present when an organism was exposed to a stressor and there was a general physiological reaction. This led him to define stress as a wide range of responses of the body to any kind of pressure (Tan & Yip, 2018).

Selye (1979) identified three theoretical stages of GAS: alarm stage, resistance stage, and exhaustion stage. The alarm stage is the initial reaction of the body after it is exposed to a stressor and it is divided into two phases. The first phase is the shock phase, where the sympathetic nervous system is suppressed, and there is a decrease in muscle tone, low blood pressure, and low body temperature. The stage can last for a few minutes to 24 hours depending on the intensity of the stressor and the vulnerability of an individual. The second phase is the counter-shock phase, which occurs when the stressor persists, when the individual is weak, or both (Higuera, 2018). In this phase, there is a fight, flight, or freeze response. The sympathetic nervous system is activated leading to the release of adrenaline, nor-adrenaline, and corticoid hormones by the adrenal gland, resulting in a high respiratory rate, high blood pressure, increased heart rate, and energy levels (Rice, 2012). Similarly, when a pregnant woman is exposed to a stressor, the sympathetic nervous system is suppressed and she experiences a drop in muscle tone, blood pressure, and body temperature. When the stressor persists, a fight, flight, or freeze response is initiated by the activation of adrenaline and nor-adrenaline, leading to an increase in heart rate, respiratory rate, blood pressure, and energy level.

In the resistance stage, the body recovers from the alarm stage. An individual is able to overcome stress, the production of hormones by adrenal glands is reduced, and blood pressure, heart rate, and respiratory rate decrease to normal levels (Higuera, 2018). If stress remains persistent and the individual is not able to overcome it, the body remains on high alert and adapts to high-stress levels, where stress hormone

(corticosteroid hormones) and blood pressure remain elevated (Rice, 2012). The individual becomes prone to fatigue, irritability, lethargy, and lack of concentration. However, when the individual manages to deal with the stressor, he/she is able to revert to a pre-activation state (Tan & Yip, 2018). Likewise, a pregnant woman in the resistance stage can recover from the alarm stage where vital observations revert to normal ranges. If stress is persistent, a pregnant woman remains on high alert, and corticosteroid hormone and blood pressure remain elevated. Pre-activation stage can be achieved when the pregnant woman manages to deal with the stressor.

The exhaustion stage is when an individual is exposed to prolonged and chronic stress (Crevecoeur, 2016). The body's adaptation to stress levels is broken down. There is increased activation of the adrenal glands, corticosteroid hormone levels remain high, causing pronounced negative effects on the digestion system, circulatory system, immune system, and other systems of the body. The individual can present with high blood pressure, fatigue, lack of appetite, and infections, and the body becomes less tolerant to any stressful situation (Rice, 2012). In this stage, the resources that an individual has to manage stress are depleted and permanent impairment of the body system occurs through wear and tear and death of cells (Crevecoeur, 2016).

In case a pregnant woman is chronically exposed to a stressor, she moves to the exhaustion stage, where she presents with a high level of corticosteroid hormones in her blood circulation. Additionally, the placenta produces a placental corticotrophin-releasing hormone, enhancing the production of corticosteroid hormones. The hormone increases the production of placental prostaglandin, which causes the ripening of the cervix and initiation of preterm labour (King et al., 2009). This clearly shows that prenatal stress can cause preterm birth.

Hans Selye showed that in the exhaustion stage, there is a persistently high level of corticosteroid hormone that negatively affects the digestive system, circulatory system, immune system, and other systems of the body in a pregnant woman. This is in line with a study done by Yonkers et al. (2014), which stated that prenatal stress contributes to vascular disorders such as hypertension and pre-eclampsia, which are the major causes of preterm births. It also leads to unhealthy behaviour such as poor diet/nutrition, taking alcohol, and smoking, also contributing factors to preterm births.

The GAS theory gives an understanding of the physiological changes that occur during alarm, resistance, and exhaustion stages when a pregnant woman is exposed to stressors. The theory also shows how prenatal stress can cause preterm birth. Although this theory reveals the complications that can occur in a pregnant woman who experiences prenatal stress, it does not explain how a pregnant woman can appraise different stressors. The cognitive aspect of a pregnant woman is important because pregnant women deal with the same stressors differently, based on how they appraise them (stressors) (Janse, 2021).

#### Transactional Model of Stress and Coping

The transactional model of stress and coping theory was used in this study to explain the cognitive aspect of stress in a pregnant woman. The model was developed by Richard S. Lazarus and Susan Folkman in 1980. They analysed and criticized the GAS theory by Hans Selye, stating that the theory treated humans as machines with no cognitive ability. They believed that human beings have the ability to think, evaluate, and react when they encounter a stressful situation (Lazarus & Folkman, 1984). The development of the transactional model of stress and coping theory emphasised the cognitive ability of a human being. The theorists came up with two

stages of appraisals human beings encounter when they experience stressful situations. These stages are the primary and secondary appraisals (Janse, 2021)

As attested by Biaggi et al. (2016), primary appraisal is the initial stage of the transactional model of stress and coping. In this stage, a person is able to evaluate a stressful situation and make a judgement if it has a direct and personal effect. This judgement results in three outcomes: the first outcome is when the event is regarded as insignificant; the second outcome is when the event is regarded as a positive encounter; and the third and final outcome is when the event has a negative encounter and it is challenging, harmful, and threatening, which is a negative appraisal (Dillard, 2019). Pregnant women are not machines, they have cognitive ability where they can experience primary and secondary appraisals when they encounter stressful situations. In primary appraisal, a pregnant woman can assess and analyse the significance of a stressor. As the theory states, a pregnant woman will not be stressed by an event that is insignificant or positively impacts her life. However, if an event is challenging, harmful, and life-threatening, the pregnant woman moves to secondary appraisal.

In the secondary appraisal process, a person does self-evaluation to identify the resources they have that can help them cope with a stressor. Secondary appraisal is influenced by two factors: the controllability and the predictability of a stressful event (Janse, 2021). An individual is more stressed when a stressful situation is uncontrollable and unpredictable. Despite the magnitude of the stressful event, individuals are affected differently by the same stressor, depending on the resources an individual has. The resources include environmental factors, social support, and knowledge and skills to deal with the threat (Lazarus & Folkman, 1984).

According to the theory, stress is reduced when a pregnant woman can take control of the situation or anticipate its outcome. Dillard (2019) noted that when an

event is uncontrollable and unpredictable, it can raise her (pregnant woman) stress level. The level of her stress will reduce if she is in a favourable environment. Resources such as social support, knowledge, and skills to deal with that stressor also lower her level of stress. In this study, the level of prenatal stress in pregnant women depended on how they were able to appraise a stressor; how they assessed its controllability and predictability, and if there were available resources to deal with that stressor. The strength of the transactional model of stress and coping theory is that it explains why different individuals respond differently to the same stressor. The theory agrees with this study because factors contributing to prenatal stress (unplanned pregnancy, IPV, lack of social support, and stressful life events) heightened the level of stress of pregnant women. It also revealed that maternal characteristics can affect knowledge and skills in dealing with these factors. The weakness of this theory is that it cannot be tested in an experiment since it is subjective (Dillard, 2019).

The theories used in the current study have given a good understanding of the theoretical base of this research. The GAS theory demonstrated an understanding of the physiological effect of stress on a pregnant woman and the foetus, and the interlinking factors between stress and preterm births. The transactional model of stress and coping elucidated the cognitive aspect of dealing with stress and how the resources that a pregnant woman has can determine her level of stress.

#### General Literature Review

The most common mental health problem among pregnant women in the world is prenatal stress (Pais & Pai, 2018). More than a third of healthy pregnant women report mild to moderate levels of prenatal stress (Bleker et al., 2019). According to Vijayaselvi et al. (2015), of ten pregnant women, one reports a high

level of prenatal stress. The prevalence of prenatal stress among pregnant women globally ranges from 11.6% to 34% (Tanpradit & Kaewkiattikun, 2020). On the other hand, in developing countries, the prevalence of prenatal stress ranges from 6% to 52.9% (Pantha et al., 2014). The prevalence of stress in Africa was 28.6% in Ghana (Boakye-Yiadom et al., 2015), and 23.1% and 11.6% in two studies done in Ethiopia (Deksisa et al., 2020; Engidaw et al., 2019).

Studies done by Gangadharan and Jena (2019), Lilliecreutz et al. (2016), and Thongsomboon et al. (2020) showed that prenatal stress is a well-established risk factor for adverse birth outcomes such as preterm births, low birth weight, and IUGR. Preterm births lead to susceptibility to diseases and increase neonatal death rates. A study done in the USA by Kornfield et al. (2022) depicted that 15.2% of women with high levels of prenatal stress had preterm births compared to 9.8% of those who had low levels of prenatal stress. Moreover, statistics showed that prenatal stress was associated with high odds of prenatal birth (aOR: 1.55, 95% CI: 1.09–2.19).

The ACOG identified prenatal stress as a significant determinant of preterm birth. Therefore, it recommends all pregnant women in America be screened for stress and other psychological issues each trimester during routine ANC visits (Deo et al., 2020). In Thailand, a study by Tanpradit and Kaewkiattiku (2020) showed that prenatal stress had a significant correlation with preterm birth. This was consistent with studies done in Sweden, America, and China by Lilliecreutz et al. (2016), Seravalli et al. (2014), and Zhu et al. (2010) respectively. Similarly, Pias and Pia's (2018) systematic review found that in all the 14 studies reviewed, increased prenatal stress was associated with prematurity and preterm delivery. The studies thus affirm that prenatal stress is a significant contributor to preterm births.

Every year, an estimated 15 million babies are born prematurely worldwide, which is more than one in ten babies. Moreover, statistics show that approximately one million children die due to complications of prematurity (Liu et al., 2016). According to WHO (2018), many preterm babies who are survivors face lifetime difficulties including learning, visual, and auditory problems. Although preterm birth has several causes, half of the spontaneous preterm delivery causes are idiopathic (unknown) (Wagura et al., 2018). Therefore, it is important to identify contributing factors to preterm births so that risk-specific strategies can be implemented.

During the antenatal period, many services are provided to pregnant women to ensure the best maternal and foetal outcomes (Shosha, 2016). The WHO antenatal guideline was prepared to aid healthcare providers in offering standardized care to all pregnant women. According to WHO (2016), the 49th recommendations were grouped into five interventions: “nutritional interventions, maternal and foetal assessment, preventive measures, interventions for common physiological symptoms, and health systems interventions to improve the utilization and quality of ANC” (p. 13). In the maternal assessment intervention, the guideline recommends health care providers ask a pregnant woman about IPV, tobacco use, alcohol, and substance abuse. However, the guideline does not have a tool to measure the psychological state of the pregnant woman. According to the United Nations Children's Fund (2021), provision of ANC by a skilled healthcare provider equips a pregnant woman with healthy behaviours and knowledge to identify warning signs. Healthcare providers are also obligated to give emotional and psychological support to the pregnant woman. Nevertheless, the WHO ANC guideline does not guide on how to assess the psychological status of the pregnant woman, affecting the quality of psychological support she might receive. Having a tool to measure the psychological status of a

pregnant woman can help a healthcare provider give needed psychological assistance or refer the woman appropriately.

### Empirical Literature Review

Past empirical studies on the prevalence of prenatal stress, factors that contribute to prenatal stress, and the relationship between demographic data and those factors are examined in this section, as per this study's research objectives.

### Prevalence of Prenatal Stress

This section reveals the magnitude of prenatal stress according to different studies. For instance, globally, the prevalence of prenatal stress ranges from 5.5% to 78% (Boekhorst et al., 2021). A study done in Washington DC found that prenatal stress is common among pregnant women, where 78% undergo mild to moderate stress levels, while 6% undergo high levels of prenatal stress (Woods et al., 2010). The prevalence of prenatal stress in pregnant women living in urban Thailand was 23.6% among participants aged between 13-43 years (Thongsomboon et al., 2020), which was lower than previous studies done in urban areas such as Saudi Arabia that had a prevalence of 33.4%, and Kuthumandu that had a prevalence of 34% (Ahmed et al., 2017; Pantha et al., 2014). Pregnant women living in urban areas have a higher prevalence of stress than those who live in rural areas, probably due to environmental and cultural differences. This was ascertained by a study done in America, where pregnant women living in urban areas have a Perceived Stress Scale (PSS) mean of 8.0 - 8.9, while those in rural areas have 4.5 - 7.7 (Thongsomboon et al., 2020). The studies revealed that pregnant women in urban settings have a high prevalence of stress. The information is important as this study was done in Nairobi County (an urban setting).



The prevalence of stress among pregnant women in the USA was 6% (Lynn et al., 2011), which was comparable to another study done in Iran that showed a prevalence of 5.5% (Shishehgar et al., 2014). On the other hand, a study done by Deo et al. (2020) revealed a prevalence of 91.8% among Iranian women who were aged between 18-40 years. This was higher than a study done in Malaysia that showed a prevalence of 75% among participants aged between 15-35 years (Keramat et al., 2021). The disparity in the prevalence was probably due to inadequate sample size. For example, the study done in Iran had a prevalence of 5.5% and had 74 respondents (Shishehgar et al., 2014), while another study done in the same county, which showed a prevalence of 91.8%, had 323 respondents (Deo et al., 2020). Furthermore, differences in geographical area and cultural practices may have caused the disparities.

In studies done in Africa, the prevalence of prenatal stress among pregnant women was 28.6% among Ghanaian pregnant women who were aged between 17-42 years (Boakye-Yiadom et al., 2015). This study was comparable to one done in Ardan Minch town government health institution in Ethiopia, where the prevalence of prenatal stress was 23.1% (Deksisa et al., 2020). On the other hand, a previous study, still done in Ethiopia by Engidaw et al. (2019) in Bale Zone Hospital, Southern Ethiopia, gave a relatively low prevalence of prenatal stress (11.6%). In that study, 52.5% of respondents were less than 24 years and the mean age was 25 (-<sup>+</sup> 5.44). A study done at Migori County Referral Hospital in Kenya showed that the prevalence of prenatal stress among pregnant women who experience IPV was 75.4%, the respondents were aged between 17-35 years (Andhavarapu et al., 2021). The disparities in the prevalence of prenatal stress in Africa and the rest of the world are probably due to cultural and geographical differences. Moreover, as per the literature

review, it has been found that there are limited studies on the prevalence of prenatal stress in Africa.

### Prevalence of Stress as Per Demographic Data

#### Parity

Parity is the number of pregnancies a woman has carried regardless of the outcome. Primigravida is a woman who is carrying a pregnancy for the first time. Multigravida is a woman in her second to fifth pregnancy. Grand-multiparas is a woman who has carried more than five pregnancies (Pillitteri, 2014). Many studies have shown that parity has a direct relation with prenatal stress. For instance, a study done by Engidaw et al. (2019) noted that Ethiopian women who had two to five pregnancies were more likely to develop stress than women who had more than six pregnancies. This was comparable to a study done by Boakye-Yiadom et al. (2015) in Ghana, which revealed that the higher the number of pregnancies, the lower the level of stress. This was probably because a grand-multiparas woman has carried previous pregnancies and might know what to expect during labour and delivery, hence reducing their level of stress.

Inversely, a study done in Ethiopia Arda Mitch town governmental health institution found that the likelihood of developing stress during pregnancy as a multipara was 3.96 times higher than primigravida women (Deksisa et al., 2020). This was especially true for multiparas who had bad obstetric history during their previous pregnancy and undesirable delivery experiences. On the other hand, a systematic literature review found that primigravida women had more stress compared to multigravida women (Pias & Pia, 2018). This was consistent with a study conducted in Bangalore India by Ramya et al. (2018), where primigravida had a statistically significant positive correlation to prenatal stress (P-value 0.022). Other studies by

Giakoumaki et al. (2009) and Tang et al. (2019) had comparable findings. This was probably due to the fact that primigravida has no previous experience with pregnancy and may be worried about what they may undergo during labour and delivery, thus increasing their stress level.

On the contrary, Andhavarapu et al. (2021) established that there was no statistically significant difference in prenatal stress prevalence between multiparas and primigravida among pregnant women in Migori County Hospital, Kenya. Primigravida and multigravida had no difference in stress levels because they might be receiving adequate social support from their significant others, which gave them knowledge and skills to deal with their stressors. Cultural practices may have enhanced this social support.

#### Maternal age

Studies have shown that maternal age has a different correlation with prenatal stress. For example, maternal age had a negative correlation with prenatal stress, where pregnant women who were below 20 years had a higher level of prenatal stress than those who were 21-35 years and above (Bödecs et al., 2013). A study done by Arch (2013) revealed that younger age was directly associated with maternal stress. This was probably for the reason that many young pregnant women might have unplanned pregnancies or might be students. Inversely, a study done by Boakye-Yiadom et al. (2015) in Ghana showed that age had a positive correlation with prenatal stress ( $P=0.0155$ ). Possibly because older pregnant women may have other children to take care of or other responsibilities, hence increasing their level of stress.

On the other hand, a study done by Biaggi et al. (2016) found that there was no significant correlation between age and prenatal stress. Similarly, a study done in Migori County Hospital by Andhavarapu et al. (2021) revealed that there was no

relationship between age and prenatal stress. A 'U' shaped effect was revealed in a study done in Ghana by Boakye-Yiadom et al. (2015), where the youngest and oldest respondents had a high level of prenatal stress. This was probably because both the youngest and the oldest might have had unintended pregnancies, which might have heightened their stress level.

#### Work status

Work status has shown both negative and positive relationships with the level of prenatal stress. For instance, a study done by Bödecs et al. (2013) established that Hungarian women who were housewives and not working had a higher level of prenatal stress compared to those who were working. This was similar to research done by Tang et al. (2019), which found that Chinese women who were not working were 1.82 times more likely to develop prenatal stress than those who were working. In a systematic review, Iranian pregnant women who were working and had financial independence were less stressed than those who were not working and financially dependent (Alipour et al., 2018). This was probably because a housewife and those who were not working had more free time to think about their pregnancy. In addition, financial dependency may have also increased their level of stress. However, contrary to this finding, Italian pregnant women who were working and those who were not working had no significant statistical association (Giardinelli et al., 2012). This was likely since, while pregnant women who were not working were stressed about financial dependency, those who were working were stressed because of balancing work and family responsibilities.

#### Level of education

Different studies have shown different kinds of correlations between the level of education and the level of prenatal stress. A study done in India showed that

women who had less than grade 11 education level (primary school level) had a high level of prenatal stress with a P value of  $> 0.05$ , which was a negative correlation (Vijayaselvi et al., 2015). This was possible because pregnant women with high education levels had the knowledge and skills to deal with stressors. On the other hand, a study done by Andhavarapu et al. (2021) and Keramat et al. (2021) revealed that there was no statistically significant relationship between the level of education and prevalence of prenatal stress among Kenyan and Iranian pregnant women respectively. A similar result was revealed in research conducted by Boakye-Yiadom et al. (2015) in Ghana. This was possibly due to the fact that pregnant women who are highly educated may have knowledge and skills for dealing with stress, while those with low levels of education may have less tendency to report stress symptoms.

#### Marital status

Marital status and level of prenatal stress have shown different kinds of relationships in many studies. Thongsomboon et al. (2020) indicated that pregnant women who were divorced and separated from their spouse had high levels of stress, with P-values of 0.001 and 0.005 respectively. Another study done in Macao, China, revealed that women who were separated, divorced, or cohabiting had a higher likelihood of appraising their lives as stressful (Lau & Yin, 2011). This was probably because women who were divorced or separated may have undergone family conflicts, moved out of their matrimonial homes, and lost their financial support from their partners. While cohabiting, women might be insecure and uncertain of their marital status and support from their intimate partner.

A systematic review by Guardino and Dunkel Schetter (2014) established that single pregnant women had a higher level of prenatal stress than those who were married. This was similar to a study done in Poland, Krakow City, which revealed

that single pregnant women had a 60% higher risk of preterm births due to high levels of psychological stress (Merklinger-gruchala & Kapiszewska, 2019). This was possibly due to the fact that single pregnant women might have had unplanned pregnancies. The intimate partner might also not acknowledge the paternity of the baby, causing conflict. The pregnant woman may also be worried about finances and the upkeep of the baby.

On the contrary, a study done in Migori County Hospital, Kenya, showed that single, married, divorced, and cohabiting pregnant women had no statistical association with prenatal stress (Andhavarapu et al., 2021). The results were likely affected by the sample size since of 150 pregnant women, only 8% (12) were single. The outcome could also be possible as single and cohabiting women had intimate partners who acknowledged the paternity of the baby. The partners may be ready to give them financial and social support. The married women may be happy and satisfied in their marriage and the divorced may have received social support from significant others.

The literature review on the relationship between demographic data and prenatal stress has drawn a logical conclusion that parity, maternal age, work status, level of education, and marital status are important mediating factors that showed a statistically significant relationship with the level of prenatal stress. Therefore, the factors were included in this study.

#### Factors that Contribute to Prenatal Stress in Pregnant Women

Several psychosocial factors contribute to prenatal stress (Engidaw et al., 2019). Some of these factors, which are linked to prenatal stress, include lack of social support, unplanned pregnancy, and IPV (Thongsomboon et al., 2020). Since there are numerous factors contributing to prenatal stress, this study was limited to the

following factors: lack of social support, IPV, unplanned pregnancy, and stressful life events.

#### Lack of social support

Lack of social support refers to when a pregnant woman reports that she does not have anyone to count on in times of trouble (Organization for Economic Co-operation and Development, 2022). Lack of social support is associated with high levels of prenatal stress as shown in several studies across the globe. For instance, studies done in Canada, Pakistan Shahryar Social Security Hospital, and Iran showed that there was a positive correlation between lack of social support and prenatal stress (Bayrampour et al., 2015, Iranzad et al., 2014, Shishehgar et al., 2014). Pregnant women in China who had low and moderate social support were 3.188 times more likely to develop prenatal stress than those who had a high level of social support (Tang et al., 2019). In a study done in Thailand, the prevalence of prenatal stress was relatively low at 23.6% since, in Thai culture, there is an enhancement of family, community, and social connectedness, which increases the social support a pregnant woman receives, hence reducing the prevalence of prenatal stress among them (Thongsomboon et al., 2020).

In Africa, Boakye-Yiadom et al. (2015) revealed that Ghanaian pregnant women who were married and received a high level of social support from their husbands had low levels of prenatal stress compared to those who were not supported by their husbands. This was possible because good social support provided pregnant women with knowledge and skills and a suitable environment to deal with stressful events, hence reducing their stress levels. Thus, lack of social support was a significant determinant of prenatal stress.

#### Intimate partner violence

Intimate partner violence is any conduct within an intimate relationship that can lead to physical violence, emotional violence, sexual violence, and controlling behaviours. Research has indicated that a history of IPV and abuse is a salient risk factor for prenatal stress (Aslan et al., 2014; Fisher et al., 2013; Tang et al., 2019). A study done in Ethiopia at Arba Minch Town (governmental town institution) revealed that 18% of pregnant women were either emotionally or physically abused by their partners (Deksisa et al., 2020). This was similar to a study in Bangladesh, which showed that the prevalence of prenatal stress among pregnant women who experienced IPV was 18% (Nasreen et al., 2011). However, the study added that seven in ten respondents were physically abused by their intimate partners once, a third were abused multiple times during their present pregnancy, and eight in ten were coerced into having sex by their partner without their consent. According to Pakhomova et al. (2021), in a study done in South Africa, IPV had a positive correlation with perceived stress. Young women who experienced IPV had a perceived stress mean of 22.6 (5.5) compared to 17.6 (6.4);  $p < 0.0001$  in women who never had such an experience.

The prevalence of IPV among pregnant women in Kenya was 9.2% mainly perpetuated by a current intimate partner at 47.6%, followed by a former intimate partner at 31.5% (Stiller et al., 2022). Research has shown that there is a high prevalence of prenatal stress among pregnant women who experience IPV in Kenya. For instance, in a study done in Migori County Hospital, 18.24% of pregnant women experienced IPV and the prevalence of prenatal stress among this group was 75.4% (Andhavarapu et al., 2021). This is probably because IPV instills a sense of fear and helplessness in a pregnant woman, hence increasing their level of stress. The studies



have shown a high prevalence of prenatal stress among women who experienced IPV, citing it as an important determinant of prenatal stress.

#### Unplanned pregnancy

An unplanned pregnancy is when a woman becomes pregnant without the intention of becoming pregnant or earlier than she expected. Many studies have revealed that unplanned pregnancy is a significant contributing factor to prenatal stress. Studies done by Tang et al. (2019) and Waqas et al. (2015) depicted that pregnant women who had unplanned/unexpected pregnancies were more susceptible to stress than those who had planned pregnancies. In a study done in Iran, pregnant women who had unplanned pregnancies were 2.58 times more likely to develop stress than those who had planned pregnancies (Keramath et al., 2021). Another study done in Ethiopia by Deksisa et al. (2020) showed that the likelihood of developing stress was 4.23 times higher in women who had unplanned pregnancies than those who had planned pregnancies. Women with unplanned pregnancies had a higher prevalence of stress than those who had planned pregnancies, probably because unplanned pregnancies can make a pregnant woman feel dejected. The pregnant woman may also experience conflict with the intimate partner or the family, and the woman might also lack social support. The literature review has exhibited that pregnant women with an unplanned pregnancy have a high probability of developing prenatal stress, citing it (unplanned pregnancy) as a notable contributor to stress (prenatal).

#### Stressful life event

Stressful life events are episodes in life that force people to make changes in their routine life patterns (Li et al., 2019). Such experiences may include the death of a participant's mother, death of a participant's father, death of a participant's spouse, death of a participant's child, and divorce (Witt et al., 2014). Additionally, they may

include hospitalization of a close family member, separation, divorce, and loss of a job (Eick et al., 2020).

Studies done in the USA and Iran have shown that pregnant women who experience stressful life events such as the death of a loved one or trauma during pregnancy have an increased risk of prenatal stress (Dolatian et al., 2016; Kinser et al., 2018). On the other hand, a meta-analysis of 31 cohort studies involving 5,665,998 pregnant women indicated that stressful life events during pregnancy were associated with a 20% high risk of preterm births (Ding et al., 2021). This was probably because stressful life events increased the level of stress hormones in a pregnant woman, predisposing her to preterm births.

A study done by Alvarenga and Frizzo (2017) in Brazil showed that the higher the number of stressful life events a woman experiences during pregnancy, the higher the number of common mental health symptoms. This was comparable to a study done in San Francisco California by Eick et al. (2020), which revealed that an increased number of stressful life events had a positive correlation to perceived stress through a direct path ( $\beta = 0.34$ , 95% CI = 0.20, 0.49). This is presumably because multiple stressful life events might make a pregnant woman blame herself and think that she is undergoing some kind of punishment. Family and friends might also blame and avoid being associated with her. Social support, however, mitigates the pathway between stressful life events and prenatal stress. For example, Iranian pregnant women who experienced stressful events and were supported by their significant others had a lower level of prenatal stress than those who did not have social support (Iranzad et al., 2014). Possibly because social support empowers a woman with knowledge and skills to deal with stress and it also acts as a buffer against stressful life events. The literature review has deduced that pregnant women who have

experienced stressful life events have a significantly high level of stress, revealing that it is an important contributor to prenatal stress.

#### Relationship between Factors Contributing to Prenatal Stress and Demographic Data

This section presents the relationship between factors contributing to prenatal stress (unplanned pregnancy, IPV, lack of social support, and adverse life events) and demographic data (age, parity, marital status, level of education, and work status).

##### Unplanned pregnancy and maternal demographic data

Women of younger age have a higher risk of unplanned pregnancy compared to older women. This was revealed by Huynh et al. (2020) and Ojuok et al. (2022) in studies done in Japan and Kenya respectively. The studies stated that women who are below 25 years old are more likely to have unintended pregnancies than women who are over 35 years old. This was probably because younger women indulge in unprotected sex and they rarely use contraceptives. However, a study done in Tanzania concluded that unplanned pregnancies increase with age (Calvert et al., 2013). This was similar to a study done in Gambia, which showed women who were 40-44 and 45-49 years old had 30.1% and 40.0% unintended pregnancies respectively (Barrow et al., 2022). This is because older women might already have their ideal number of children, so an additional one they regard as undesired.

Parity showed a significant relationship with unplanned pregnancy, where women who were pregnant for the first time were more likely to have unplanned pregnancy compared to those who were carrying a 2nd and above pregnancy (Barrow et al., 2022; Merga et al., 2021). This may be age-related since many women who are pregnant for the first time are below 25 years. These women may lack knowledge of how to use contraceptives.

Marital status shows a positive relationship with an unplanned pregnancy. As attested by Merga et al. (2021), in a study done in Ethiopia, women who are married are more likely to get unintended pregnancies than single women. This was true, especially for women who waited for their husbands to decide for them about the use of contraceptives. On the other hand, research conducted in Gambia showed different results, where single women were 11.38 times more likely to have unplanned pregnancies (Barrow et al., 2018). This was probably because single women are likely to be young and may not be on any contraceptive. Marital status showed no statistically significant relationship with unplanned pregnancy in a study done in Kenya (Ojuok et al., 2022).

Women who had a low level of education had a positive correlation with unplanned pregnancy. Merga et al. (2021) noted that expectant young women who were illiterate and of lower education level were three times more likely to have unintended pregnancies compared to literate pregnant women. Comparable findings were found in studies done in Malawi and Ethiopia by Getu et al. (2016) and Hall et al. (2016) respectively. This was possible because women who are illiterate and of low education level may not have bargaining power for safe sex and the use of contraceptives.

Work status had a negative correlation with unplanned pregnancy. Pregnant women who are employed were 96% times less likely to have unplanned pregnancy (Merga et al., 2021). Studies done in St Louis regional centre in the USA and Ghana showed that women who are not employed had a higher likelihood of having unplanned pregnancies than those who are employed (Ameyaw, 2018; Iseyemi et al., 2017). This might be because women who are unemployed are financially dependent.

This makes them have low bargaining power for safe sex and use of contraceptives. They may also use sex as a source of income-generating act.

#### Intimate partner violence and demographic data

Intimate partner violence has a significant association with age. According to Lima et al. (2021), in a study done in Brazil, age was inversely correlated with IPV; the older the woman the lower the likelihood of experiencing IPV. In the study, women who were 20-29 years old had the highest prevalence of IPV at 72.4%. Another study done in Kenya showed that women who were 15-17 years old were more likely to experience IPV than those who were older. The findings showed that the older the woman the less likely she is to experience IPV (Stiller et al., 2022). This was probably because younger women may not be able to protect themselves from an abusive intimate partner; they may also be financially dependent, making them live at the mercy of the perpetrator.

Level of education had a negative correlation with IPV; the higher the education level, the lower the likelihood of experiencing IPV, as per research done in Kenya Migori County (Morris et al., 2020). According to Stiller et al. (2022), women who had primary school education and those with no education had higher odds of experiencing IPV than those at secondary and tertiary levels. This was possible since women with a higher education level have matured and may make better choices of a husband. They may also be empowered, know their rights, and have better bargaining power to reject abuse. On the contrary, a study done by Carmichael et al. (2019) in the USA indicated that women with a middle level of education had a high likelihood of IPV. The study disclosed that having higher education does not protect women from IPV.

Marital status had a significant statistical association with IPV, where being divorced, separated, or cohabiting was an important risk factor for pregnant women suffering violence (Stiller et al., 2022). These women were prone to experience IPV possibly because divorced and separated women might have been divorced or separated due to IPV. For cohabiting women, there might be uncertainty in marriage and intimate partners might question paternity, leading to IPV.

Parity is an important predictor of IPV. A study done in Uganda by Katushabe et al. (2022) revealed that women who had more than one child (multiparous) had a higher likelihood of disclosing that they were experiencing IPV than those carrying their first pregnancy (primigravida). The data translates that primigravidas may have low odds of IPV not because they do not experience it but because they do not disclose it. This is probably due to the fact that most primigravida are newly married and they may be hoping their intimate partner would change as they continue with the marriage. On the other hand, research by Stiller et al. (2022) revealed that women with one or two children had low odds of IPV since children acted as protection against IPV.

Work status is associated with IPV where women who were unemployed or not working had a high likelihood of experiencing IPV (Morris et al., 2020). Unemployed women depended on their intimate partners for financial support. This made them vulnerable and have less bargaining power. They could not resist abuse because they feared losing financial support.

Lack of social support and demographic data

Maternal age was an important predictor of lack of social support. Young women who are 18 years old and below were less likely to receive social support from their significant others (Bidzan, 2013). This was probably because many of them

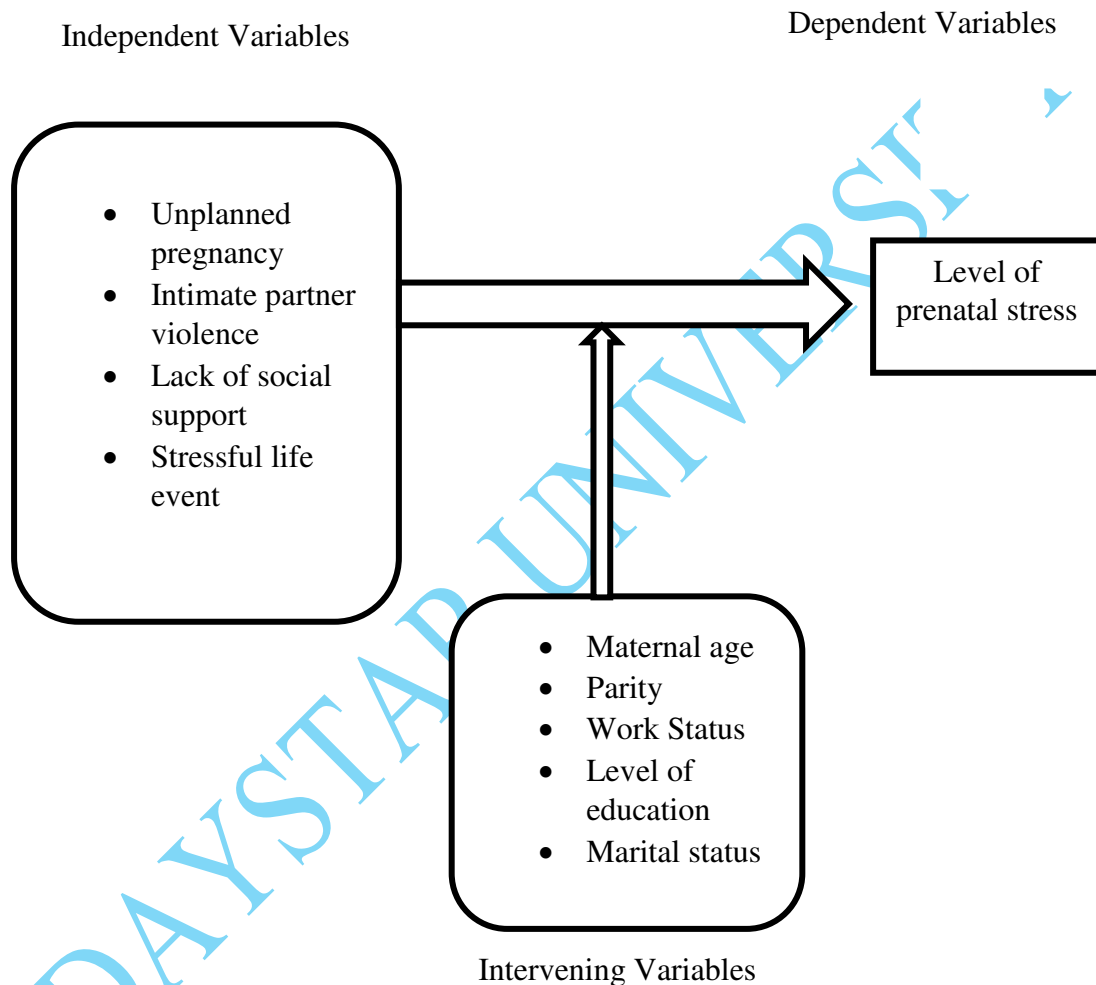
might be single with unplanned pregnancies, which brings conflicts in their family, leading to lack of social support. The family might fail to support them (pregnant women) due to getting pregnant out of wedlock and the intimate partner might deny the paternity and reject them. On the other hand, older women who were 30 years old and above were found to have a more stable life with a stable network, enhancing their social support in Poland (Lutkiewicz, 2020).

Level of education had a negative relationship with lack of social support. Women who had high education levels received more social support (Lutkiewicz, 2020). This was likely since women with higher education levels have advanced in age and have good social networks, which enhance their social support. Similar findings were portrayed in a study done by Schappin et al. (2013), who noted that women who had low education levels had low social support due to a lack of skills to create social networks.

Marital status has an important statistical association with lack of social support. According to Abdi et al. (2022), in a study done at Iran Babol University, married women received better social support compared to women who are single or cohabiting. A similar finding was revealed by research done in England, which showed women who were not living with their intimate partners received lower social support compared to those who were married (Taylor et al., 2022). This is likely because women who are married have a bigger social network of relatives and friends of both maternal and paternal sides. Those (pregnant women) who are single might have only the maternal side who might not support them due to being pregnant out of wedlock.

## Conceptual Framework

A conceptual framework is the researcher's reasoning or understanding of how the concepts of the research interact to answer the research questions (Regoniel, 2020). The relationship between different variables was shown as per the study. Figure 2.1 illustrates the conceptual framework.



*Figure 2.1: Conceptual Framework*

Source: Author (2023)

## Discussion of the Conceptual Framework

In Figure 2.1, independent variables are the factors that contribute to prenatal stress in pregnant women (unplanned pregnancy, IPV, lack of social support, and stressful life events). Despite having the independent variables, prenatal stress level in



a pregnant woman can be affected by intervening variables, which are maternal age, parity, work status, level of education, and marital status. Intervening variables are not independent since they are hypothetical or mediator variables that can affect the relationship between independent and dependent variables (Crossman, 2021). The level of prenatal stress is the dependent variable, which is affected by the interaction between independent and intervening variables.

### Summary

Chapter two explained the theoretical framework: the theories used were GAS and the transactional model of stress and coping. The chapter also presented both the general and empirical literature reviews. Finally, the conceptual framework has shown a diagrammatic representation of independent, intervening, and dependent variables and how they interact with each other in this study. The following chapter outlines the methodology of the study.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### Introduction

This chapter describes the research design that was used in this study, the target population, sampling methods, data collection techniques, and pretesting of the data collection instrument. The chapter also outlines how the data was analysed to get conclusive results and how these results were presented. Finally, the chapter explains ethical considerations to ensure the safety of the respondents and guarantee that research ethics were adhered to throughout the research process.

#### Research Design

Research design is a method that is used to generate answers to specific research questions (Kothari, 2009). According to Saunders et al. (2014), a research design facilitates smooth running of the research, ensuring that the research process is feasible, affordable, and cost-effective. A quantitative cross-sectional research design was used in this study. It is an analytical research where subjects are sampled at a particular point, and the relationship between the presence and absence of a risk factor at that time is then investigated. This design helped the researcher assess the presence or absence of prenatal stress among pregnant women attending selected ANC clinics in Nairobi County. The design also allowed the researcher to investigate factors contributing to prenatal stress. It also allowed the analysis of the relationship between factors contributing to prenatal stress and demographic data to identify pregnant women who are more vulnerable to these factors.

The quantitative cross-sectional research design enabled the researcher to investigate multiple variables at the same time such as characteristics of pregnant

women (age, work status, marital status, and level of education) and the factors contributing to prenatal stress (unplanned pregnancy, IPV, lack of social support, and stressful life events). The design helped to verify the potential association or correlation of multiple variables in this study, where the relationship between factors contributing to prenatal stress and demographic data was analysed. The design also enabled the researcher to understand what is presently happening to pregnant women attending selected ANC clinics in Nairobi County.

A cross-sectional research design was used since it reduced bias in data collection and increased reliability in the analysed information by conducting the study in a consistency environment for the respondents. The design allowed sampling, which was done as a representative of the whole population, thus reducing bias and making the research operation affordable and cost-effective. It could be very expensive and time-consuming if data collection was done for the whole population (Cherry, 2019).

A cross-sectional design can only be used to describe what is happening presently to pregnant women as it is just like a snapshot. That means a different description can be given if the same population is examined for another period of time. Although it also gives associations and relationships between different variables, it cannot give the causes and effects of those variables. The design has Neyman bias or prevalence bias where in this study, sick pregnant women were not included.

### Population

A research population is a group of individuals, objects, or items the researcher is interested in. It is the entire group that has all the characteristics the researcher needs to draw a study conclusion from (Sprinthall, 2010). Pregnant women

attending selected ANC clinics in Nairobi County comprised the population of this study.

### Target Population

Target population is a group of individuals the researcher used to draw a sample frame from as it is not feasible to conduct research on the whole population (Kothari, 2009). In this study, pregnant women attending level three hospitals with over 700 ANC clients in Nairobi County were the target population. According to the Kenya Health Information System, every month, an average of 873 pregnant women are attended to in the six-level three hospitals with over 700 ANC clients per month; approximately 29% of the pregnant women visit the clinic for the first time (new) and 71% are continuing clients (revisits) (Ministry of Health, 2022). This study took one month, therefore, the target population was 873 pregnant women.

Table 3.1 shows the names of level three hospitals with over 700 ANC clients both new and revisits as of February 2022.

*Table 3.1: Level 3 Hospitals with Over 700 ANC Clients*

Name of the facility	New Clients	Revisits	Total
Njiru Health Centre	272	616	888
Mukuru Health center	255	504	759
Mathare North Health Centre	219	606	825
Makadara Health Centre	233	774	1,007
Kayole II health Centre	270	577	847
Kahawa West Health Centre	268	646	914
Total	1,517	3,723	5240

$$\text{Average} = 5240 / 6 = 873 \text{ ANC Clients}$$

$$\% \text{ of New Clients: } 1,517 / 5240 \times 100 = 28.95 = 29\%$$

$$\% \text{ of revisits: } 3,723 / 5240 \times 100 = 71.0 = 71\%$$

Approximately 29% are New Clients and 71% are Revisits

### Study Sites

The study was done in two selected level-three hospitals. The first hospital was Makadara Health Center, which is in Makadara Sub-County, Nairobi County. The other hospital was Mathare North Health Center in Ruaraka Sub-County, Nairobi County.

### Sampling Design

A sample design is an explicit method of obtaining a sample from a given population; it is the procedure the researcher used to acquire individuals who participated in the research (Creswell & Creswell, 2013). The first sampling design used in this study was purposive sampling design. Purposive or selective sampling is a non-probability sampling design where researchers use their subjective judgment to select a population to participate in the study. In this study, level four hospital ANC clinics were not included since a majority of ANC clients attending these hospitals are referrals from level three or level two hospitals. These clients might have different medical or obstetric conditions during pregnancy. Level two hospitals were also not included because they attend to low numbers of ANC clients.

The study opted for a study population from level three hospitals since a majority of pregnant women are given routine ANC services in these facilities. Furthermore, all level three hospitals gave free services to clients and patients. There are 58 level three hospitals in Nairobi County that are under Nairobi County Government. Some of these level-three hospitals give ANC services to less than 20 ANC clients per month, while others give services to over 700 ANC clients per month. The level three facilities that give services to over 700 ANC clients, which translates to over 35 clients per day, were included in this study. According to the Kenya Health Information System February 2022, only six level three hospitals attended to over 700 clients per month. It was not feasible to include all the six-level

three hospitals in the study; the facility sample size was calculated using the 30% rule:  $30/100 \times 6 = 1.8$  meaning two facilities. So, two level three hospitals were included in the study.

Simple random sampling was the second sampling design to be used in this study. Simple random sampling design is a probability sampling design where samples are given equal probability to be included in the study. The names of the six level three hospitals were written on six small sheets of paper of equal size and same color, then they were folded and put in a bowl. The papers were thoroughly mixed then two sheets of paper were randomly picked from the bowl. The level three hospitals that were picked were Mathare North Health Centre and Makadara Health Centre.

The respondents in the two selected level three hospitals who participated in this study were selected using a stratified sampling design. Stratified sampling design is a probability sampling design where the target population is divided into strata to make sure the researcher captures all the characteristics needed in the study. Therefore, in this study, pregnant women attending ANC clinics were divided into two strata. The first stratum was pregnant women who were continuing clients (revisits) and the second stratum was pregnant women who were attending ANC clinic for the first time (new). The researcher used this method to be able to include both the revisit and new pregnant women without bias. Systematic sampling design was also used to get the desired number of respondents in each stratum. Systematic sampling design is a probability sampling method where respondents are selected from a random starting point, with a fixed sampling interval (nth) (Kabir, 2016). The random starting point (nth) was selected using a simple random sampling design. In the current study, every 3rd client in each stratum was included.

### Sample Frame

Sample frame is a complete list of all the individual characteristics of the population that the researcher wants to include in the study (Kabir, 2016). The population in this study comprised antenatal women attending selected level three hospitals (Mathare North Health Centre and Makadara Health Centre). Pregnant women, who were more than 20 weeks of gestation and had come for routine ANC check-ups for their first time (new) or continuing visits (revisits) were included in the present study.

### Sample Size

This is the formula the researcher used to come up with the exact number of individuals who participated in the study. Slovin's formula was used to calculate the sample size.

$$n = N / (1 + Ne^2)$$

n is the sample size

N is the target population size (873 pregnant women)

e is the error margin (0.05) had a confidence level of 95% (Susanti et al., 2019).

$$\text{So: } n = 873 / (1 + 873e^2)$$

$$n = 873 / (1 + 873 \times 0.05^2)$$

$$n = 873 / (1 + 873 \times 0.0025)$$

$$n = 873 / (1 + 2.2)$$

$$n = 873 / 3.2 = 272.8$$

$$n = 273 \text{ pregnant women}$$

The study took one month, two weeks in each facility

Respondents in each facility were  $273/2 = 136.5$

To the nearest whole number, each facility had 137 respondents

The total number of respondents was 274

71% were continuing (revisits) pregnant women and 29% were new pregnant women

Revisits in each facility =  $71/100 \times 137 = 97.3 = 97$  ANC clients

New in each facility =  $29/100 \times 137 = 39.7 = 40$  ANC clients

Total sample size in each facility:

$97 + 40 = 137$  pregnant women

The total sample size for the whole study was 274 pregnant women

Attrition is a situation whereby participants drop out of the research study or do not complete or return the questionnaire to be analysed (Bhandari, 2021). In this study, attrition was factored in by adding 5% of the sample size:

- 5% of 274

=  $5/100 \times 274$

=  $0.05 \times 274$

=  $13.7 = 14$  participants

Therefore, the sample size was  $14 + 274 = 288$



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## Sampling Techniques

This is the method the researcher used to come up with the required sample size from the target population. Figure 3.1 presents the study's sampling techniques.

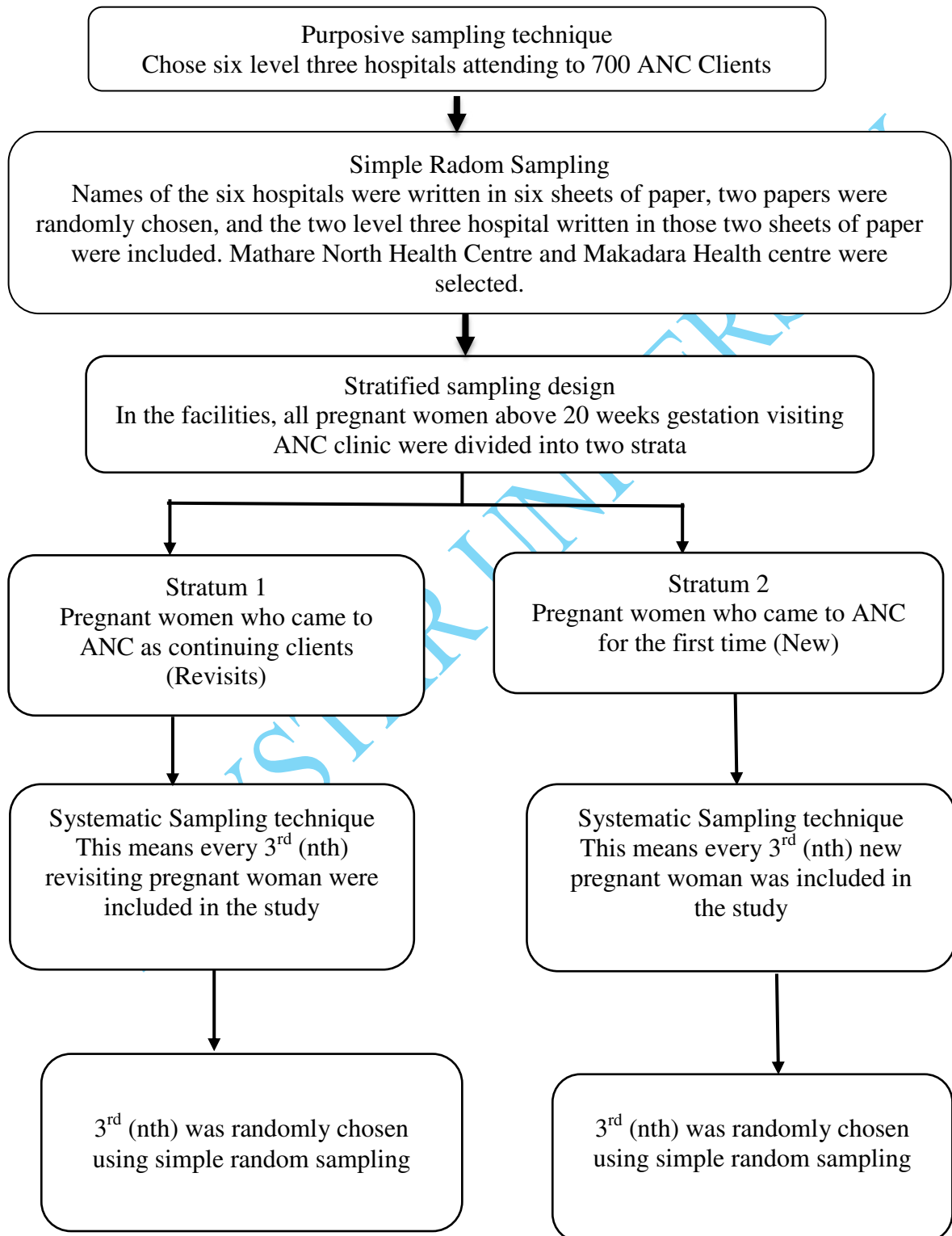


Figure 3.1: Sampling Techniques

## Data Collection Instruments

A research instrument is a screening tool that is used to collect data from the respondents to get the desired results as per research objectives (Kothari, 2009). A self-administered structured questionnaire was used in this study. A social demographic questionnaire, which was researcher formulated as per the three objectives of the study, was used to investigate the factors contributing to prenatal stress and also gave the respondent's demographic characteristics. Additionally, this study used a Perceived Stress Scale with 10 items (PSS 10), a standardized tool to measure the level of stress in an individual. PSS 10 was developed by Sheldon Cohen and was published in 1983. It evaluates the degree to which an individual appraises a situation as stressful. PSS is a 5-point Likert-type scale questionnaire where the respondent is expected to choose never = 0, almost never = 1, sometimes = 2, fairly often = 3, and very often = 4. The score ranges from 0-40; a score of 21-40 indicates the presence of perceived stress (Cohen, 1994). A score of 21 was the cut-off point, any pregnant woman with a score of 21 and above was considered to have prenatal stress.

## Data Collection Procedures

Training of two research assistants was done to equip them with essential information about the study. The training also helped the research assistants adhere to all ethical considerations to uphold the safety of the respondents. After getting approval from relevant authorities, the researcher sought permission from the Nairobi County Government, followed by the Makadara Sub-County office and from Ruaraka Sub-County office. After permission was granted from the sub-county offices, the researcher sought permission from the facility in charge of both Mathare North and

Makadara Health Centres. Permission was also sought from the nurse in charge of ANC clinics in both facilities where the study was conducted.

Once permission to access the respondents was granted, the researcher met all the respondents at the waiting bay and provided them with essential information about the study. This essential information included the purpose of the study, significance of the study, and how the study would benefit them. The respondents who were found to have high stress levels were treated for stress and referred appropriately. The respondents were also informed that there was no stipend to be given for their participation. The researcher made sure that the respondents adhered to COVID-19 protocols - social distancing, sanitizing their hands, and sanitizing pens before use.

Sampling was done and all the sampled respondents signed an informed consent before filling out the questionnaire. The study used self-administration mode. This is where the researcher gave the questionnaire to the respondents to fill them by hand after signing the informed consent and then returning them to the researcher. Although the questionnaire was in the English language, for respondents who were sampled and could not understand English the questionnaire was translated to Kiswahili language. The filling of the questionnaire took an average of 15 minutes. The data collection procedure took 20 days, five days a week from Monday to Friday because the ANC clinic did not operate on weekends. All questionnaires had a unique code to avoid losing any and to be able to differentiate them. The questionnaires were then kept under lock and key to prevent them from being handled by an unauthorized person.

#### Inclusion and Exclusion Criteria

The study included level three hospitals in Nairobi County that attend to more than 700 ANC clients. In those facilities, all pregnant women who were above 20

weeks gestation attending routine ANC clinics as new and revisits were included. Level four, level two, and level three hospitals that attend to less than 700 ANC clients were not included in this study. Sick pregnant women (women who present with obstetric or medical conditions such as pre-eclampsia, anaemia, and diabetes, among other conditions) were also not included in the study. Dealing with their condition was a priority and the level of stress might be heightened by their sickness. Women whose pregnancies were below 20 weeks gestation were not included in this study. This was because some of them might have just discovered that they were pregnant and may not be able to tell their experiences with their significant others.

### Pretesting

Pretesting is the administration of the research instrument to a small sample of participants from the sample population (Kothari, 2009). The purpose of pretesting is to assess the validity and clarity of the research instrument - if the instrument has stable and consistent results - and also to identify any error in the instrument and come up with a possible solution. The researcher formulated a social demographic questionnaire that was pretested in Kahawa West Health Centre, which was one of the level three hospitals with more than 700 ANC clients. Kahawa West Health Centre has similarities with the selected level three hospitals since the hospital is under the Nairobi County government, offers free ANC services to all pregnant women, and gives routine ANC services to over 700 clients. During pretesting of the data collection instrument, 10% of the sample size was used.

n=10% of 274

n= 27.4

n= 27 pregnant women were participants

The researcher formulated social demographic questionnaire was found to be valid and reliable to be used in the current study.

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## Reliability and Validity of the Research Instrument

Reliability refers to the ability of an instrument to give stable and consistent results. Validity is the ability of the research instrument to measure what it is intended to measure (Deo et al., 2020). Pretesting helped to resolve whether the researcher formulated social demographic questionnaire was understandable, consistent, and would measure what it was intended to measure. Pretesting of the social demographic questionnaire was done at Kahawa West Health Centre. PSS 10 has been validated to be used in different racial groups, ethnic groups, the general population, and pregnant women. The instrument was used to assess stress in pregnant women in a study done in China by Tang et al. (2019), in Malaysia by Deo et al. (2020), and in Thailand by Thongsomboon et al. (2020). The instrument has also been used in Africa to assess pregnant women in studies done by Deksisa et al. (2020) and Engidaw et al. (2019), both studies were done in Ethiopia. The instrument was utilised in Kenya by Andhavarapu et al. (2021) to assess antenatal stress among pregnant women in Migori County Referral Hospital. In a study done by Manzar et al. (2019) in Ethiopia, PSS 10 had a Comparative Fit Index  $> 0.95$  and McDonald's Omega of 0.78 and 0.68; these findings supported its validity. Additionally, PSS 10 was found to have moderate reliability with a Cronbach Alpha of 0.7 in young women in South Africa (Pakhomova et al., 2021).

## Data Analysis Plan

Data analysis is a systematic statistical procedure used to reduce raw data so that it can be interpreted to give a certain research conclusion (Bhat, 2020). It is also the process where raw data is inspected, cleaned, reorganized, and modified in order to come up with a conclusion (Akinyode & Khan, 2018). Cleaning of the raw data was done to check for any duplication or record mismatch, and remove any errors

before analysing the data. Two research assistants verified and entered the data separately, and then a comparison of the two data entries was done to identify any mismatch or duplication and rectify any error that was found.

In the study, data analysis was done using the Statistical Package for the Social Sciences (SPSS), version 25. Objective one was analysed using descriptive data analysis to get the prevalence of prenatal stress in pregnant women. The same method was used for objective two to obtain the factors that contribute to prenatal stress in pregnant women. For the third objective, correlation data analysis was used to determine the relationship between demographic data and the factors that contribute to prenatal stress.

#### Data Presentation

Data presentation is a visual demonstration of analysed data, which can either be textual, tabular, graphic, or by use of charts to show a certain conclusion (In & Lee, 2017). In this study, the results of the analysed data were presented using, tables, graphs, and pie charts. The results, conclusion, and recommendations would be disseminated to relevant authorities.

#### Ethical Considerations

Approval from the Daystar University Institutional Scientific Ethics Review Committee (DU-ISERC) was sought to check whether the study had adhered to measures that protected the rights and safety of the respondents. The researcher also sought approval from the National Commission for Science, Technology and Innovation (NACOSTI) for research clearance to ensure that the research was of good quality, beneficial, and did not cause any harm to the respondents. Following this, the researcher sought permission from the Nairobi County government, Ruaraka, and



Makadara Sub-Counties. The researcher then sought permission from Mathare North Health Centre and Makadara Health Centre facilities' in-charges to be able to access the facilities. In Mathare North and Makadara Health Centres, the researcher sought permission from nurses who were in charge of ANC clinics to be able to access the respondents.

Adults and emancipated minor respondents of this research study signed informed consent before filling out the questionnaire. Only emancipated minors were encountered, no minor needed a guardian to sign their consent. Pregnant women who were willing to participate in the study filled out the questionnaire, no one was coerced to participate.

Some respondents cried bitterly when they were answering the questionnaire, the research process triggered them to have a negative psychological effect. They explained that the questionnaire made them remember their undesirable experiences. The respondents underwent psychological debriefing, which helped them reduce psychological distress and prevented them from developing psychiatric disorders. Those who needed further psychological support were referred to the hospital counsellor.

The respondents were enlightened on confidentiality. They were informed that the information given was to be used for research purposes only, and it would not be shared with any unauthorized persons. The respondents were also informed about the limit to confidentiality. For instance, if the researcher identifies that beyond reasonable doubt the respondent was planning to harm herself or others or a case of child abuse and neglect. The researcher has a right to report such instances to relevant authorities. The researcher also has a professional duty to protect life. The names of the respondents were not included in the questionnaire. Instead, each respondent was

given a unique number to enhance confidentiality. Furthermore, to protect the respondents' information, the filled questionnaire copies were kept under lock and key, with only authorized persons having access. Finally, all the previous studies referred to in the current study were acknowledged through citations.

### Summary

Chapter three has discussed in detail the research methodology used in this study. The topics discussed were as follows: research design (revealed the method that was used to generate answers to the three research questions in this study); target population (presented the individual characteristics that the researcher needed to get the desired results from and also help in the formulation of the sample frame); and sampling techniques (showed the method that was used by the researcher to get the exact number of respondents that participated in this study). Slovin's formula was used to determine the sample size in this study. The chapter also revealed how data was collected, the instrument used to collect the data, and the validity and reliability of that instrument. It (chapter) showed how data was analysed to come up with results as per the research objectives and how the analysed data was presented. Finally, the chapter has described how the researcher adhered to all ethical considerations to ensure that respondents were safe and protected.

## CHAPTER FOUR

### DATA PRESENTATION, ANALYSIS AND INTERPRETATION

#### Introduction

This chapter consists of a descriptive summary of the study results. Tables, graphs, and pie charts as a presentation of the results were displayed. The researcher's understanding and interpretation of the results was presented. The results were revealed as per the study's three research objectives: prevalence of prenatal stress, factors contributing to prenatal stress, and, finally, the relationship between these factors and demographic data.

#### Data Analysis and Interpretation

##### Response Rate

This section presents the total response rate of the study based on the number of questionnaires collected. The number of questionnaires administered to the respondents was 288 and 264 were returned. This means only 24 questionnaires were not returned. The sample size of the study was 274 respondents, questionnaires returned were 264.

Response rate:

$$264/274 \times 100 = 96.35\%$$

The response rate was 96.35%, which was adequate for the study.

The respondents who had come for their first visits (new) were 28% (74) and revisits were 72% (190).

##### Prevalence of Prenatal Stress

Table 4.1 summarizes the prevalence of prenatal stress.

*Table 4.1: Prevalence of Prenatal Stress*

		Frequency	Percent
Valid	No Stress	135	51.1
	Stress	129	48.9
	Total	264	100.0

Table 4.1 shows that the prevalence of prenatal stress among pregnant women in selected ANC clinic was 48.9%, and those who were not stressed were 51.1%. This means almost half the number of respondents in this study had prenatal stress.

### Demographic Analysis

The study sought to establish the respondents' information used by the study with regard to maternal age, marital status, work status, level of education, and parity.

#### Maternal age

The respondents were asked their age in order to determine whether maternal age had a positive relationship with prenatal stress. The analysis is presented in Table 4.2.

*Table 4.2: Maternal Age on Prenatal Stress Cross-tabulation*

		Prenatal Stress		Total	Percent
		Not Stressed	Stressed		
Age	15 -24 years	65 (52.00%)	60 (48.00%)	125	47.35
	25-34 years	68 (52.31%)	62 (47.69%)	130	49.24
	Above 35 years	2 (22.22%)	7 (77.78%)	9	3.41
Total		135	129	264	100

Respondents between the ages of 25 to 34 years of age were 49.24% (Table 4.2). Those who were between the ages of 15 to 24 years of age were 47.35%. The lowest percentage was indicated by respondents above 35 years, represented by 3.41%. The findings showed that respondents who were above 35 years had the highest prevalence of stress indicated by 77.78%, to be exact, 7 out of 9 respondents had prenatal stress. The respondents who were between the ages of 15 to 24 years had a prevalence of 48.00%. The age group that had the lowest prevalence of prenatal stress of 47.69% was between 25-34 years. The analysis indicates that prenatal stress

varies with maternal age. The study showed that pregnant women who were 35 years and above were more stressed compared to those who were below 35 years.

#### Marital status

This study sought to establish the marital status of the respondents in the categories of married, single, divorced, cohabiting, or separated. The analysis is portrayed in Table 4.3.

*Table 4.3: Marital Status on Prenatal Stress Cross-tabulation*

		Prenatal Stress		Total	Percent
		Not Stressed	Stressed		
Marital status	Married	120 (53.57%)	104 (46.43%)	224	84.85
	Single	13 (37.14%)	22 (62.86%)	35	13.25
	Divorced	1 (100%)	0	1	0.38
	Cohabiting	0	2 (100%)	2	0.76
	Separated	1 (50%)	1 (50%)	2	0.76
Total		135	129	264	100

Table 4.3 indicates that most of the respondents were married as represented by 84.85%. Single respondents were 13.25% and those who were cohabiting and separated had the same percentage at 0.76%. Divorced had the lowest percentage indicated by 0.38%. On prenatal stress, respondents who were cohabiting had a 100% prevalence of prenatal stress. Even though they were only two, both of them were stressed. Single respondents followed with a prenatal stress prevalence of 62.86%, and they were 22 in number. These findings revealed that 104 married respondents had prenatal stress with a prevalence of 46.43%. Respondents who were separated were only two; one of them had prenatal stress and the other one did not, thus the prenatal stress prevalence was 50%. Only one respondent was divorced and she had no stress, showing a 0% prevalence of stress. The analysis displayed that pregnant women who are cohabiting and those who are single are more likely to suffer from prenatal stress, even though those cohabiting were very few in number.

### Level of education

Respondents indicated their highest level of formal education. The levels were primary, secondary, and tertiary levels. Responses are displayed in Table 4.4.

*Table 4.4: Level of Education and Prenatal Stress Cross-tabulation*

		Prenatal Stress		Total	Percent
		Not Stressed	Stressed		
Level of education	Primary level	19 (38.78%)	30 (61.22%)	49	18.56
	Secondary level	75 (58.14%)	54 (41.86%)	129	48.86
	Tertiary level	41 (47.67%)	45 (52.33%)	86	32.58
Total		135	129	264	100

The results in Table 4.4 indicate that most of the respondents' level of education was secondary (48.86%), followed by tertiary level (32.58%). The lowest percentage was 18.56%, indicating respondents with primary level education. On prenatal stress, the respondents who had primary school level education had the highest prevalence of prenatal stress (61.22%). Those who were at tertiary level followed with a prevalence of 52.33%. The respondents who were at secondary level had the lowest prevalence of prenatal stress (41.86%). The analysis depicts that the level of education had a "U" shaped effect, where, respondents with the lowest level of education and those who had the highest level of education had a higher prevalence of prenatal stress compared to those who had a middle level of education.

### Work status

Work status is used to measure financial dependency and the pregnant women's ability to balance family and work. The results are demonstrated in Table 4.5.

*Table 4.5: Work Status and Prenatal Stress Cross-tabulation*

		Prenatal Stress		Total	Percent
		Not Stressed	Stressed		
work status	Employed	32 (47.14%)	24 (42.86%)	56	21.21
	Self-employed	27 (42.86%)	36 (57.14%)	63	23.87
	Unemployed	76 (52.41%)	69 (47.59%)	145	54.92
Total		135	129	264	100

Table 4.5 indicates that 54.92% of the respondents were unemployed, while 23.87% were self-employed. The lowest percentage was 21.21%, which indicated the employed respondents. The finding showed that self-employed respondents had the highest prevalence of prenatal stress (57.14%). Those who were unemployed followed with a prevalence of 47.59%. However, the respondents with the lowest prevalence were those who were employed (42.86%). The analysis revealed that most respondents were unemployed. On the other hand, those who were self-employed were more likely to suffer from prenatal stress compared to those who were employed and unemployed.

#### Parity

Parity was used to explain the number of pregnancies each respondent had carried represented by primigravida (1st pregnancy), multigravida (2nd to 5th pregnancy), and grand-multiparas (6th and above). Table 4.6 presents the analysis.

*Table 4.6: Number of Pregnancies on Prenatal Stress Cross-tabulation*

		Prenatal Stress		Total	Percent
		Not Stressed	Stressed		
Number of pregnancies you are carrying	First pregnancy	62 (56.36%)	48 (43.64%)	110	41.66
	2nd-5th pregnancy	72 (48.32)	77 (51.68%)	149	56.44
	6th and above	1 (20%)	4 (80%)	5	1.89
Total		135	129	264	100

Table 4.6 shows that most of the respondents' parity was 2nd-5th pregnancy (multigravida) (56.44%), followed by those who were pregnant for the first time (primigravida) (41.66%), and the lowest representation (1.89%) were those in their 6th and above pregnancy (grand-multiparas). The analysis showed that grand-multiparas had the highest prevalence of prenatal stress (80%) but the respondents were only 4. They were followed by multigravidas (51.68%) and primigravidas had the lowest prevalence (43.64%). The analysis indicated that the higher the number of

pregnancies a woman had carried, the higher the chances of suffering from prenatal stress.

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### Factors Contributing to Prenatal Stress

The researcher used descriptive data analysis to investigate factors that contributed to prenatal stress. This study analysed the following factors: unplanned pregnancy, IPV, lack of social support, and stressful life events.

#### Unplanned pregnancy

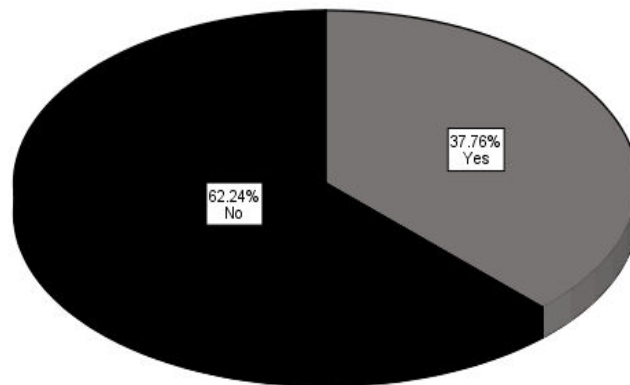
The status of pregnancy was used to define whether the pregnancy was planned or unplanned among the pregnant women. The analysis is shown in Table 4.7.

*Table 4.7: Status of Pregnancy on Prenatal Stress Cross-tabulation*

		Prenatal Stress		Total	Percent
		Not Stressed	Stressed		
Status of your pregnancy	Planned	98 (56.32%)	76 (43.68%)	174	65.74
	Unplanned	37 (41.11%)	53 (58.89%)	90	34.26
Total		135	129	264	100

Table 4.7 indicates that most respondents had planned pregnancies, 174 (65.74%), while those who had unplanned pregnancies were 90 (34.26%). Respondents who had unplanned pregnancies had the highest prevalence of prenatal stress at 58.89%. The finding was less than respondents who had planned pregnancies, whose prevalence of prenatal stress was 43.68%. The analysis indicated that women who had unplanned pregnancies were more likely to have prenatal stress compared to those who had planned pregnancies.

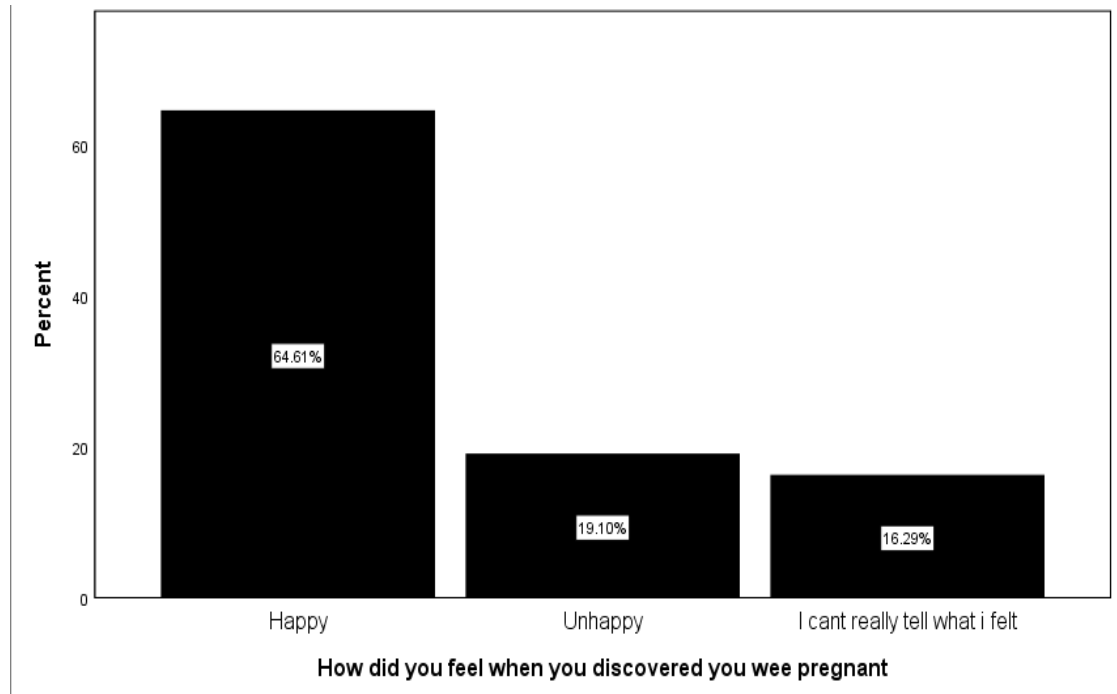
Figure 4.1 shows if the respondents used any family planning method



*Figure 4.1: Family Planning*

The respondents who had unplanned pregnancies were asked whether they were on any family planning method. Most respondents, 56 (62.24%), showed that they did not use any family planning method to protect them from having unplanned pregnancies. On the other hand, 34 (37.76%) of the respondents were on family planning methods, which showed that the contraceptive they used failed, hence causing an unplanned pregnancy. What may have caused the failure was not investigated in this study. The analysis concludes that most respondents with unplanned pregnancies did not protect themselves from getting pregnant.

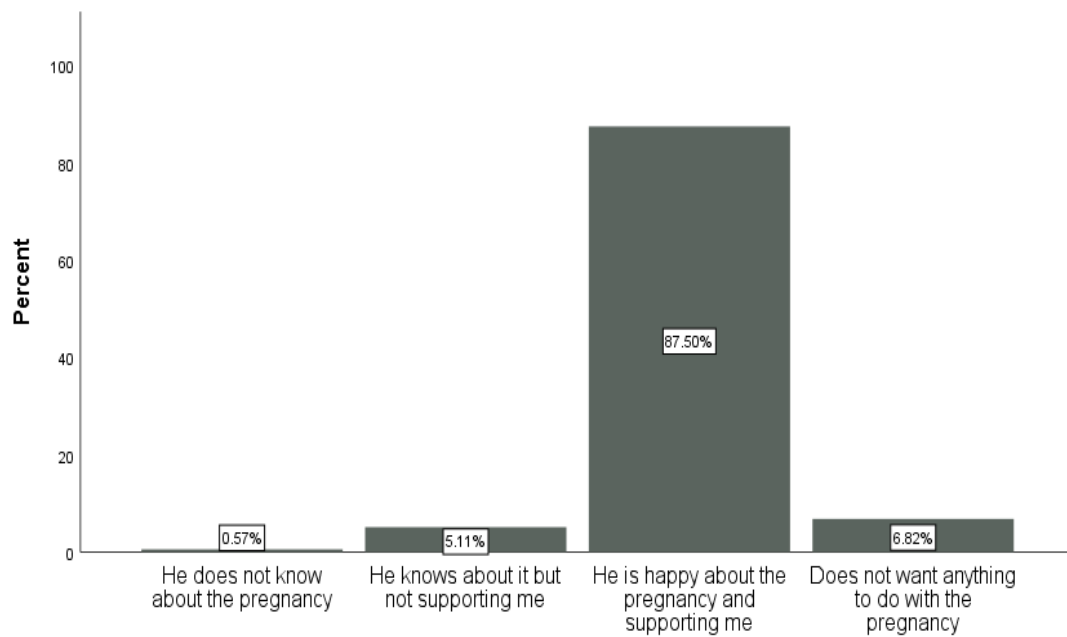
Figure 4.2 illustrates respondents' feelings when they discovered they were pregnant.



*Figure 4.2: Respondents' Feelings When They Discovered They Were Pregnant*

Figure 4.2 shows that most respondents represented, 58 (64.61%), were happy about their pregnancy, while 17 (19.10%) indicated that they were unhappy. Respondents who could not tell what they felt were 15 (16.29%). The analysis concludes that, although the respondents had unplanned pregnancies, a majority of them were happy about their pregnancy.

The reaction of the intimate partner when he discovered the pregnancy is displayed in Figure 4.3.



*Figure 4.3: Reaction of the Intimate Partner When He Discovered the Pregnancy*

Figure 4.3 shows that most respondents agreed that their intimate partners were happy and were supporting them, 78 (87.50%). The support from the intimate partner is significant in the reduction of prenatal stress. The analysis indicated that only one woman said that her intimate partner did not know about the pregnancy (0.57%). On the other hand, 5 (5.11%) of the respondents agreed that their intimate partners were aware of the pregnancy, but were not willing to support them. Some respondents, 6 (6.82%), reported that their intimate partners knew about their pregnancy, but did not want anything to do with it. Thus, the analysis points out that most of the intimate partners were happy and supported their partner despite having an unplanned pregnancy.

### Intimate partner violence

Intimate partner violence is any conduct within an intimate relationship that can lead to physical violence, emotional violence, sexual violence, and economic violence.

Table 4.8 presents IPV and prenatal stress cross-tabulation.

*Table 4.8: IPV and Prenatal Stress Cross-tabulation*

		Prenatal Stress		Total	Percent
		Not Stressed	Stressed		
Have you experienced IPV during this pregnancy	Yes	17 (34.69%)	32 (65.31%)	49	18.56
	No	118 (54.88%)	97 (45.12%)	215	81.44
Total		135	129	264	100

The results in Table 4.8 show that 81.44% of the respondents reported that they have not experienced IPV. However, 18.56% of respondents reported that they experienced IPV during their current pregnancy. Table 4.8 also indicates that for those who experienced IPV, most of them suffered from prenatal stress (65.31%). On the other hand, 215 respondents did not experience IPV, despite that 45.12% of respondents suffered from prenatal stress. The analysis showed that IPV during pregnancy increased the likelihood of suffering from prenatal stress.

The different types of IPV experienced by the respondents are demonstrated in

Figure 4.4.

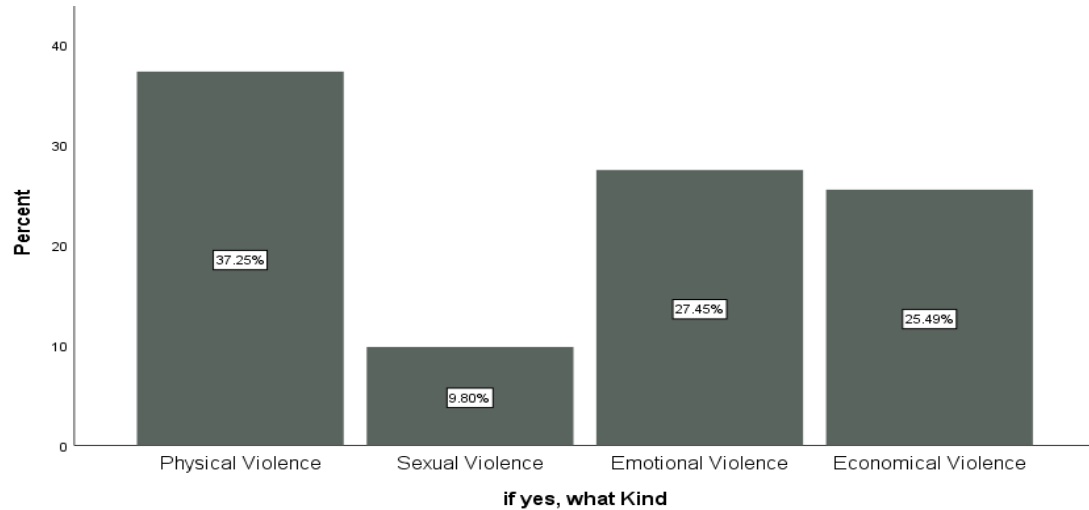
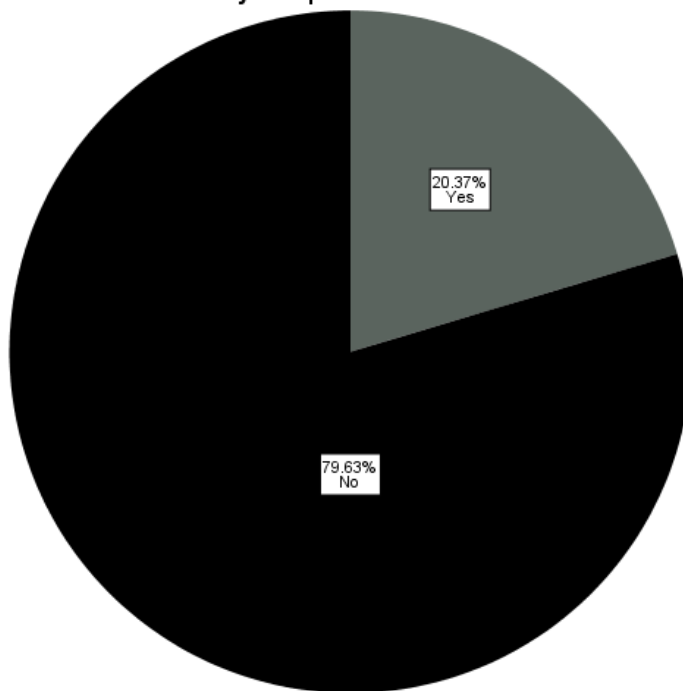


Figure 4.4: Different Types of IPV Experienced by Respondents

Figure 4.4 shows the different kinds of violence that pregnant women experience: physical violence, sexual violence, emotional violence, and economic violence. The kinds of IPV reported were 52 since some women reported more than one kind of IPV. According to the analysis, respondents who experienced physical violence were 37.25%, those who suffered from emotional violence were 27.45%, and 25.50% experienced economic violence. The lowest number of respondents suffered from sexual violence (9.80%). Consequently, the analysis indicated that most of the respondents experienced physical violence from their intimate partner during pregnancy.

Figure 4.5 depicts reporting cases of IPV.



*Figure 4.5: Reporting Cases of IPV*

Of the 49 respondents who had experienced IPV during pregnancy, 39 (79.63%) did not report the case to the relevant authority and only 10 (20.37%) reported it (Figure 4.5). This analysis indicates that most respondents who experienced IPV never reported the cases to relevant authorities.

Figure 4.6 portrays the respondents' reasons for not reporting.

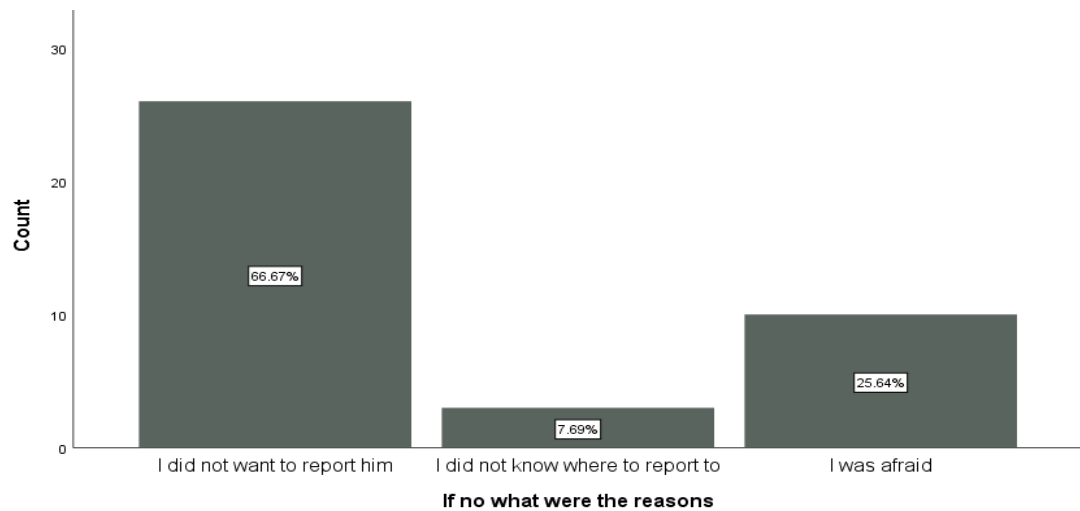


Figure 4.6: Reasons for Not Reporting

Respondents who had experienced IPV were asked the reason why they never reported the incident to a relevant authority. Figure 4.6 shows that most of them, 26 (66.67%), indicated that they did not want to report their intimate partner. Some respondents, 10 (25.64%), were afraid to report their partners to a relevant authority. Respondents who did not know where to report their intimate partner were 3 (7.69%). The analysis, therefore, revealed that most of the respondents who experienced IPV were not willing to report their partner to relevant authorities.

#### Lack of social support

Lack of social support is associated with high levels of prenatal stress, as shown in several studies across the globe. This study's results are presented in Table 4.9.

Table 4.9: Lack of Social Support and Prenatal Stress Cross-tabulation

		Prenatal Stress		Total	Percent
		Not Stressed	Stressed		
Did you get adequate social support during this pregnancy	Yes	115 (49.75%)	116 (50.25%)	230	87.12
	No	14 (50%)	14 (50%)	34	12.89
Total		135	129	264	100



Table 4.9 indicates that most respondents (87.67%) had adequate social support during their current pregnancy and those who did not receive social support were 12.33%. The finding showed that respondents who felt like they received adequate social support had a prenatal stress prevalence of 50.25%, which was almost the same as respondents who felt they were not supported (50%). The analysis revealed that pregnant women who were socially supported and those who were not socially supported had almost the same level of prenatal stress.

Table 4.10 summarises who respondents depended on when they needed help.

*Table 4.10: Who Respondents Depended on When They Needed Help*

	Frequency	Percent
No one	4	1.5
My intimate partner	185	70.1
My parents	50	18.9
My parent's in-law	4	1.5
Others (Siblings, Friends, Community, Church)	21	8.0
Total	264	100

The findings in Table 4.10 reveal that when respondents need help, most of them get it from their intimate partners (70.1%). Respondents who got help from their parents were 18.9%, while those who got help from their parent's in-laws were 8.0%. The lowest percentage was 1.5%, which indicates the respondents who got help from no one and those who got help from others (siblings, friends, community, and church). The study showed that pregnant women received help from their intimate partners.

Table 4.11 shows those who respondents counted on to make them feel better.

*Table 4.11: Those Who Respondents Counted on to Make Them Feel Better*

	Frequency	Percent
No one	6	2.3
My intimate partner	166	62.9
My parents	50	18.9
My parents-in-law	6	2.3
Others (siblings, friends, community, church)	36	13.6
Total	264	100%

Table 4.11 shows that 62.9% of the respondents reported that they counted on their intimate partner to make them feel better when they were feeling down. Of the respondents, 18.9% depended on their parents. Those who depended on others (siblings, friends, community, and church) were 13.6%. The lowest percentage was 2.3% who depended on their parents-in-law and those who depended on no one. The analysis indicated that intimate partners were supportive when their pregnant women were feeling down.

Those whom respondents relied on for consolation when they were upset are presented in Table 4.12.

*Table 4.12: Those Whom Respondents Relied on for Consolation When They Were Upset*

	Frequency	Percentage
No one	8	3.0
My intimate partner	150	57.0
My parents	54	20.5
My parent's in-law	5	1.9
Others (Siblings, Friends, Community, Church)	47	17.6
Total	264	100

The results in Table 4.12 show whom pregnant women can rely on for consolation when they are upset. Most respondents (57.0%) reported that they relied on their intimate partners. Also, there was a large number of respondents (20.5%) who relied on their parents. The lowest percentage was 1.9%, who reported that they relied on parents-in-law. The respondents who relied on no one and those who relied on others (siblings, friends, community, and church) were 3.3% and 17.6% respectively. The analysis, therefore, concludes that respondent depended on their intimate partners for consolation when they were upset.

### Stressful life event

Stressful life events are episodes in life that force people to make changes in their routine patterns of life. The analysis is depicted in Table 4.13.

*Table 4.13: Stressful Life Event and Prenatal Stress Cross Tabulation*

		Prenatal Stress		Total	Percent
		Not Stressed	Stressed		
Have you experienced stressful life events during this pregnancy	Yes	25 (34.72%)	47 (65.28%)	72	30.64
	No	91 (55.83%)	72 (44.17%)	163	69.36
Total		116	119	235	100

Table 4.13 indicates that most respondents never experienced stressful life events during their current pregnancy (69.36%). Those who experienced stressful life events were 30.64%. However, 65.28% of those who experienced stressful life events suffered from prenatal stress. This indicates that stressful life events were a predictor of prenatal stress.

Types of stressful life events respondents experienced are portrayed in Table 4.14.

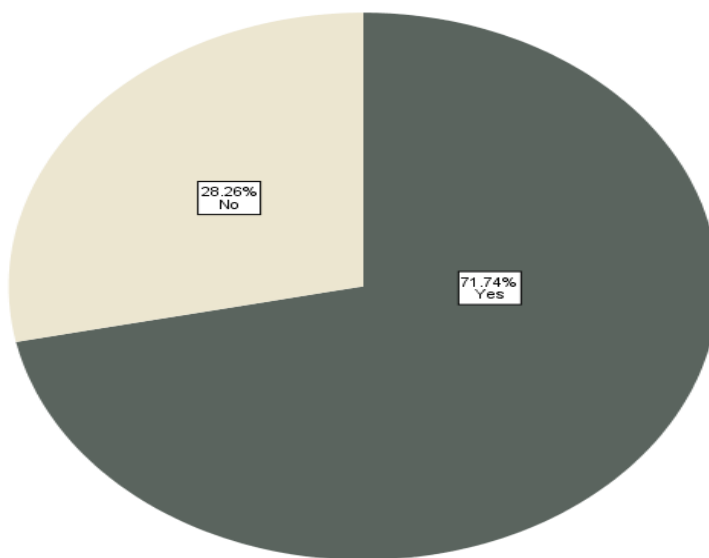
*Table 4.14: Types of Stressful Life Events Respondents Experienced*

	Frequency	Percent
Death of a spouse	3	4.2
Death of your child	8	11.1
Death of your parents	6	8.3
Divorce	6	8.3
Loss of a job	49	68.1
Total	72	100

The findings in Table 4.14 show that out of the 72 respondents who had experienced stressful life events during pregnancy, 68.1% reported that they lost their jobs. The lowest percentage of respondents (4.2%) experienced death of a spouse.

Death of a child, death of parents, and divorce were represented by 11.1%, 8.3%, and 8.3% respectively.

Figure 4.7 displays respondents' support when experiencing stressful life events.



*Figure 4.7: Support During Stressful Life Events Experienced*

Figure 4.6 shows whether respondents received support when they experienced stressful life events. Most respondents, 34 (71.74%), received support during stressful events, while 13 (28.26%) did not have support during stressful events. Lack of support during stressful life events leads to an increase in prenatal stress.

#### Relationship between Factors Contributing to Prenatal Stress and Demographic Data

Unplanned pregnancy and demographic data

An unplanned pregnancy can be a significant source of stress for many individuals, particularly if they feel unprepared or uncertain about their ability to cope with the challenges of parenthood. Maternal characteristics such as age, parity, marital status, and level of education can increase the possibility of having an unplanned pregnancy.

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Table 4.15 tabulates the relationship between unplanned pregnancy and demographic data.

*Table 4.15: Relationship between Unplanned Pregnancy and Demographic Data*

	Demographic Data	Frequency	Percentage	Pearson Correlation	Sig (2 tailed)
Age	15 -24 years	48	55.81	-0.069	0.278
	25-34 years	33	38.37		
	Above 35 years	5	5.81		
Marital status	Married	56	65.12	0.303	0.000
	Single	27	31.40		
	Divorced	0	0.00		
	Cohabiting	1	1.16		
	Separated	2	2.33		
Level of education	Primary level	21	24.42	-0.045	0.478
	Secondary level	33	38.37		
	Tertiary level	32	37.21		
Work status	Employed	14	16.28	0.111	0.08
	Self-employed	18	20.93		
	Unemployed	54	62.79		
Parity	First pregnancy	42	48.84	0.07	0.271
	2 <sup>nd</sup> -5 <sup>th</sup> pregnancy	41	47.67		
	6th and above	3	3.49		

The results in Table 4.15 show that the total number of respondents who had unplanned pregnancies was 86. The highest number of respondents who had unplanned pregnancies were between the ages of 15 years and 24 years (55.81%). There was a negative weak relationship between age and unplanned pregnancy at -0.069, with a significant level of 0.278, depicting that the younger the women the higher the possibility of having an unplanned pregnancy. The study also showed that a majority of the respondents with unplanned pregnancies were married (65.12%) and there was a positive weak correlation between unplanned pregnancy and marital status at 0.303, implying that the odds of marital status led to higher odds of unplanned pregnancy.

Work status and unplanned pregnancy had a positive weak correlation of 0.11. This implied that an increase in work status leads to an increase in unplanned pregnancy. Most of the unemployed respondents had unplanned pregnancies

(62.79%). Parity and unplanned pregnancy had a positive but very weak correlation of 0.07, meaning that an increase in parity slightly increases the possibility of having an unplanned pregnancy. However, most of the respondents with unplanned pregnancies were primigravidas (48.84%).

In addition, only 24.24% of respondents at primary school level had unplanned pregnancies. Those in secondary and tertiary levels had higher percentages of 38.37% and 37.21% respectively. The relationship between the level of education and unplanned pregnancy was -0.045, which was a negative weak correlation. Thus, implying that the lower the education level, the higher the possibility of having an unplanned pregnancy.

#### Intimate partner violence and demographic factors

Intimate partner violence can take many forms including physical, sexual, emotional, and financial abuse. The analysis shows which group of respondents were more affected by IPV (Table 4.16).

*Table 4.16: Relationship between IPV and Demographic Factors*

Demographic Data	Frequency	Percentage	Pearson Correlation	Sig (2tailed)
Age	15 -24 years	20	-0.027	0.669
	25-34 years	25		
	Above 35 years	1		
Marital status	Married	36	-0.198	0.002
	Single	6		
	Divorced	1		
	Cohabiting	1		
	Separated	2		
Level of education	Primary level	13	0.111	0.081
	Secondary level	20		
	Tertiary level	13		
Work status	Employed	12	0.083	0.191
	Self-employed	12		
	Unemployed	22		
Parity	First pregnancy	13	-0.103	0.106
	2 <sup>nd</sup> -5 <sup>th</sup> pregnancy	33		
	6 <sup>th</sup> and above	0		

According to the analysis, 46 respondents experienced intimate violence during pregnancy. Table 4.19 shows that most respondents who experienced IPV were between the ages of 25 to 34 years old (54.35%). The correlation between IPV and age was -0.027, which was a weak negative correlation, implying that the older the woman the lower the chances of experiencing IPV. The relationship between marital status and IPV was -0.198, which was a negative weak correlation, meaning that the lower the odds of marital status, the higher the chances of experiencing IPV. In marital status, most respondents who experienced IPV were married (78.26%).

Regarding the level of education, most pregnant women who experienced IPV were at secondary level (43.48%). IPV and level of education also have a positive weak correlation of 0.111, meaning that the higher the level of education, the higher the odds of experiencing IPV. Research also showed that most women who experienced IPV were unemployed (47.83%) and the relationship between work status and IPV was 0.083, which was a weak positive correlation. Hence, higher odds of work status increased the odds of experiencing IPV. Parity had a negative weak correlation of -0.103, with a significance of 0.106, implying that the higher the parity, the less likely the woman will experience IPV. However, most respondents who experienced IPV were multigravida (2nd to 5th pregnancy) (71.74%).

#### Lack of social support and demographic factors

Lack of social support during pregnancy can have negative impacts on both the mother and the developing baby. Adequate social support is important for a woman's emotional well-being during pregnancy. Table 4.17 shows the relationship between lack of social support and demographic data.



*Table 4.17: Relationship between Lack of Social Support and Demographic Data*

Demographic Data		Frequency	Percentage	Pearson Correlation	Sig (2 tailed)
Age	15 -24 years	11	39.29	0.115	0.085
	25-34 years	14	50.00		
	Above 35 years	3	10.71		
Marital status	Married	21	75.00	0.056	0.399
	Single	7	25.00		
	Divorced	0	0.00		
	Cohabiting	0	0.00		
	Separated	2	7.14		
Level of education	Primary level	3	10.71	0.039	0.556
	Secondary level	15	53.57		
	Tertiary level	10	35.71		
Work status	Employed	8	28.57	0.02	0.761
	Self-employed	2	7.14		
	Unemployed	18	64.29		
Parity	First pregnancy	11	39.29	0.003	0.97
	2 <sup>nd</sup> -5 <sup>th</sup> pregnancy	17	60.71		
	6th and above	0	0.00		

The data in Table 4.17 indicates that the total number of women who felt like they lacked adequate social support was 28. The analysis showed that lack of social support and demographic data had a weak positive correlation. The relationship between age and lack of social support was 0.115, which was a weak positive correlation. This implied that the older the women, the higher the odds of reporting lack of social support. The results also indicated that most respondents who reported lack of social support were between the ages of 25 and 34 years (50%). This was higher than those who were between 15-24 years (39.29%). The research showed that older women can experience lack of social support more than younger women who are thought to be more vulnerable.

Most of the respondents who reported lack of social support were married (75%) (Table 4.17). This result revealed that single, cohabiting, and divorced women felt that they received adequate social support than those who were married. The relationship between marital status and lack of social support had a weak positive correlation of 0.056, meaning that increased odds of marital status increase lack of

social support. In addition, the study depicted that women who had a secondary school level of education were 53.57%. The relationship between level of education and lack of social support was 0.039, which was a weak positive correlation. This implied that an increased level of education increased the lack of social support.

Furthermore, 64.29% of unemployed respondents reported lack of social support (Table 4.17). The relationship between work status and lack of social support had a weak positive correlation of 0.02, with a significance level of 0.761, meaning that the higher the odds of work status the higher the odds of lack of social support. Most of the respondents who lacked social support were multigravida (2nd to 5th pregnancy) (60.71%). The correlation between parity and lack of social support was very weak, as indicated by 0.003, implying that when parity increases, lack of social support slightly increases.

#### Stressful life events and demographic factors

Experiencing a stressful life event during pregnancy can have negative effects on the mother's mental and physical health, as well as the health of the developing baby. Stressful life events can include major life changes such as death in the family, divorce, or job loss. The relationship between stressful life events and demographic data is portrayed in Table 4.18.

*Table 4.18: Relationship between Stressful Life Events and Demographic Data*

	Demographic Data	Frequency	Percentage	Pearson Correlation	Sig (2tailed)
Age	15 -24 years	37	51.39	0.035	0.089
	25-34 years	32	44.44		
	Above 35 years	3	4.17		
Marital status	Married	57	79.17	-0.133	0.41
	Single	12	16.67		
	Divorced	1	1.39		
	Cohabiting	1	1.39		
	Separated	1	1.39		
	Level of education	Primary level	10		
Secondary level	32	44.44			
Tertiary level	30	41.67			
Work status	Employed	16	22.22	0.017	0.793
	Self-employed	17	23.61		
	Unemployed	39	54.17		
Parity	First pregnancy	32	44.44	0.062	0.345
	2 <sup>nd</sup> -5 <sup>th</sup> pregnancy	40	55.56		
	6th and above	0	0.00		

The findings in Table 4.18 indicate that 72 respondents had experienced stressful events during their current pregnancy. Most respondents (51.39%) who experienced stressful life events were between the ages of 15 and 24 years. However, the correlation between stressful life events and age was 0.035, which was a weak positive. This implied that stressful life events slightly increase with age. The relationship between stressful life events and marital status was a weak negative correlation of -0.133, meaning that low odds of marital status slightly increase the odds of stressful life events. The study also showed that most of the pregnant women who experienced stressful life events were married (79.17%).

Most respondents who experienced stressful life events had a secondary level of education (44.4%). The relationship between level of education and stressful life events was -0.088, implying that the higher the education level the lower the odds of experiencing stressful life events (Table 4.18). The correlation between stressful life events and work status was 0.017, meaning the higher the odds of work status, the slight increase in the odds of stressful life events. Most respondents (54.17%) who

were unemployed experienced stressful life events. In parity, 55.56% of multigravidas (2nd to 5th pregnancy) experienced stressful life events. The correlation between parity and stressful life events was 0.062, which was a positive weak correlation, implying that there is a slight increase in stressful life events when parity increases (Table 4.18).

#### Summary of Key Findings

1. The prevalence of prenatal stress among pregnant women in selected ANC clinics in Nairobi County was 47.3%. Pregnant women who were above 35 years old had a prevalence of prenatal stress of 77.7%. Second, pregnant women who were cohabiting and single had a prevalence of prenatal stress of 100% and 62% respectively. Third, pregnant women who had primary school level of education had the highest prevalence of prenatal stress at 61.2%. Fourth, regarding work status, self-employed pregnant women had the highest prevalence of prenatal stress at 57.1%. Lastly, in parity, pregnant women who were on their 6th and above pregnancy (grand-multiparas) had the highest prevalence of prenatal stress at 80%.
2. The prevalence of prenatal stress among respondents who had unplanned pregnancies was 58.8%. Those who had an unplanned pregnancy and never used contraceptives were 62.2%.
3. The prevalence of prenatal stress among respondents who experienced IPV was 65.31%. Most respondents suffered physical violence (37.25%). Those who suffered IPV and never reported were 79.63%.
4. Pregnant women who lacked social support and those who received social support had almost the same prevalence of prenatal stress (50.25% and 50% respectively).

5. Pregnant women who experience stressful life events had a prenatal stress prevalence of 62.3%.
6. Correlation between unplanned pregnancy and demographic data: marital status had the highest correlation of 0.303, while level of education had the lowest indicated by -0.045.
7. Correlation between IPV and demographic data: level of education had the highest correlation of 0.111, while marital status had the lowest indicated by -0.198.
8. Regarding the relationship between lack of social support and demographic data, age had the highest correlation of 0.111, and parity had the lowest indicated by 0.003.
9. Concerning the relationship between stressful life events and demographic data, parity had the highest correlation of 0.062, while marital status had the lowest of -0.133.

#### Summary

This chapter has outlined a presentation of analysed data displayed using tables, pie charts, and bar graphs, while a text was used to explain what has been presented. The research findings were interpreted to give an understanding of what was discovered after conducting the study. Key findings have been displayed to capture the main results discussed in the ensuing chapter.

## CHAPTER FIVE

### DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

#### Introduction

This chapter presents a summary of the research. The findings of the study are discussed and interpreted. The significance of understanding factors that contribute to prenatal stress is examined and knowledge acquired in this study is summed up in the conclusion. The chapter also gives recommendations, where the researcher suggests specific interventions or strategies to address issues identified regarding factors contributing to prenatal stress.

#### Discussions of Key Findings

#### Prevalence of Prenatal Stress

Prenatal stress is a common occurrence during pregnancy and can cause various adverse effects including preterm deliveries, low birth weight, and pre-eclampsia. In this study, the findings showed that the prevalence of prenatal stress among respondents in selected ANC clinics in Nairobi County was 48.9%. This was within the worldwide range, which was 5.5% to 78% (Boekhorst et al., 2021). The prevalence was lower than a study done in Iran and Malaysia, which was 91.8% and 75% respectively (Deo et al., 2020, Keramat et al., 2021). The finding of this study was higher than studies done in Africa, for instance, studies conducted in Ghana (Boakye-Yiadom et al., 2015) and Ethiopia (Engidaw et al., 2019) had a prevalence of 28.6% and 11.6% respectively. The disparities were probably due to environmental and cultural differences in those countries. The high prevalence in this study might also be due to the timing since data collection was done immediately after Kenya's general elections. The country's political instability may have influenced the

responses. The COVID-19 virus aftermath could have also brought about the negative effect.

A study done in Kenya by Andhavarapu et al. (2021) revealed a prenatal stress prevalence of 75.4%, which is higher than the findings in this study. This disparity was probably because the study was done in Migori County, a rural setting, while this study was done in Nairobi County, an urban setting. Environmental, social, and cultural differences in rural and urban areas could also be a reason for these disparities. In addition, the study done in Migori only assessed prenatal stress among pregnant women who had experienced IPV, which could have increased their stress levels. On the other hand, the current study assessed prenatal stress among all pregnant women attending routine ANC clinics regardless of their experiences.

#### Factors Contributing to Prenatal Stress

Maternal age, parity, level of education, and work status were found to be significant factors that contributed to prenatal stress. In this study, women who were 35 years old and above had the highest prevalence of prenatal stress at 77.78%, depicting that older pregnant women had higher chances of suffering from prenatal stress compared to younger pregnant women. The findings were most likely due to sample size, where, respondents who were over 35 years old were only 9 in number, 7 of them had prenatal stress, hence increasing the prevalence. This finding was similar to that of a study by Boakye-Yiadom et al. (2015), which showed that age was positively correlated with prenatal stress. This was possibly due to the fact that women who are over 35 years old may have had other children to care for, overwhelming them and increasing their stress levels. On the contrary, a study done by Arch (2013) showed that younger age was directly associated with prenatal stress, where women below 20 years old had a high prevalence of prenatal stress.

Concerning marital status, the findings showed that respondents who were cohabiting and those who were single had a high prevalence of prenatal stress (100% and 62.9% respectively). This indicated that the likelihood of suffering from prenatal stress was higher in pregnant women who were cohabiting or single compared to those who were married, divorced, or separated. This was supported by study a by Guardino and Dunkel Schetter (2014), which stated that single pregnant women had a heightened level of prenatal stress than those who were married. The high level of stress made these single women have a higher risk of preterm births. GAS theory revealed that stress negatively affects the physiological status of a pregnant woman, leading to preterm births.

Singlehood was also a contributor to prenatal stress. This could be because single pregnant women might lack social support from their intimate partners. They may also be the sole breadwinners, forcing them to work extra hard to provide for their families. Cohabiting respondents, who were only two in number and both of them had prenatal stress, had a high prevalence of stress probably because of the low sample size. Another reason could be that cohabiting women might be insecure or uncertain about their marital status.

The results of this study displayed parity as an important contributor to prenatal stress. The results showed that the higher the number of pregnancies, the higher the level of prenatal stress. Grand-multiparas had the highest prevalence of stress, followed by multiparas, and primigravida had the lowest prevalence. This study was similar to one in Ethiopia, which showed that the likelihood of developing stress in pregnancy as a woman who had more than one pregnancy was 3.96 times higher than in primigravida women (Deksisa et al., 2020). This was probably because multiparas women may have undergone undesirable experiences during their previous



pregnancies, labour, or delivery. Consequently, they might anticipate experiencing the same problem during the current pregnancy, increasing their level of prenatal stress. To affirm that, in this study, respondents were told to write down what was making them stressed and overwhelmed. One of the respondents wrote that she lost her baby during the delivery of her previous pregnancy and she was not told the cause of death. Thus, she was stressed and overwhelmed because she was afraid the same thing might happen to her unborn baby.

Work status was found to be a significant contributor to prenatal stress. Self-employed pregnant women had a higher prevalence of prenatal stress compared to those who were unemployed and those employed. A study done by Tang et al. (2019) showed a contradicting finding, where Chinese pregnant women who were not employed were 1.82 times more likely to develop prenatal stress than those who were employed and self-employed. Another contradicting study concluded that unemployed Iranian pregnant women had high levels of prenatal stress (Alipour et al., 2018). The findings of the current study were different likely due to the fact that self-employed respondents face challenges because of financial constraints experienced in the country (Kenya) after the coronavirus pandemic. Data collection was also done a few months after the general election, when business stability had not been achieved, which may be another possible reason.

Level of education was an important contributor to prenatal stress. This study has shown that respondents who had primary education level had a higher prevalence of stress in comparison to those in secondary and tertiary levels. This corresponded with a study conducted by Vijayaselvi et al. (2015), who stated that women with a lower level of education had a high likelihood of prenatal stress due to a lack of knowledge and skills to cope with stress effectively. The finding was also supported

by the transactional model of stress and coping theory, which stated that the level of stress can be reduced when an individual has the knowledge and skills to deal with stressful situations, assuming that education can give this knowledge and skills. On the other hand, a study by Andhavarapu et al. (2021) revealed that there was no statistically significant relationship between the level of education and the prevalence of prenatal stress, which was contrary to the findings of the current study.

This study revealed that the factors contributing to prenatal stress were unplanned pregnancy, IPV, lack of social support, and stressful life events. This was comparable to a study done in Thailand, which disclosed that IPV, unplanned pregnancy, and lack of social support were significant predictors of prenatal stress (Thongsomboon et al., 2020). This study revealed that the prevalence of unplanned pregnancy among pregnant women in selected ANC clinics in Nairobi County was 34.3%. This was higher than a study done at Kenyatta National Hospital ANC clinic, which showed a prevalence of 29.9% (Ojuok et al., 2022). The disparity was possible because of environmental differences between both studies, the current study was done in selected level three hospitals in Nairobi County, while the previous study was done in a National Hospital (Kenyatta).

The findings of this study also showed that unplanned pregnancy was a significant predictor of prenatal stress. The analysis indicated that women with unplanned pregnancies have a high prevalence of prenatal stress (58.9%). A study done in Ethiopia showed a comparable result where the odds of developing stress were 4.23 times higher in women who had unintended pregnancy than those who had intended pregnancy (Deksisa et al., 2020). These findings were possible since women with unplanned pregnancies might worry about how they will take care of their

unborn child. Their intimate partner might have denied the paternity, leaving them with no support.

The study also showed that most of the respondents (62.2%) did not use any family planning method to prevent them from getting pregnant. This brings the conclusion that most pregnant women in selected ANC clinics in Nairobi county do not embrace the use of contraceptives, increasing the number of women having unplanned pregnancies. On the other hand, 37.8% got pregnant while they were still on a family planning method. The possible cause of the failure of contraceptives was not investigated in this study. Those respondents may have felt frustrated because they used contraceptives but still got pregnant, which contributed to their high level of prenatal stress. This was affirmed by the transactional model of stress and coping theory by Lazarus and Folkman (1984), which states that stress increases when a situation is uncontrollable and unpredictable. Failed contraceptives made respondents lose control of their situation.

Respondents with unplanned pregnancies had a different feeling when they discovered they were pregnant. Most of the respondents reported that they were happy when they discovered they were pregnant. Some of them reported they felt unhappy and others could not even tell what they felt. These negative feelings associated with unplanned pregnancy could contribute to a high prevalence of prenatal stress among this group of respondents. To affirm this, in a study done by Barton et al. (2017), pregnant women who had negative feelings after discovering they had an unplanned pregnancy had high odds of suffering from psychological problems.

The reactions of the intimate partners when they discovered the respondents were pregnant were also different. Most of the respondents reported that their intimate partners were happy and they were ready to support them. However, some

respondents reported that they had not even informed their intimate partner, others reported that their intimate partner was aware of their pregnancy but was not willing to support them, and others reported that their intimate partners wanted nothing to do with the pregnancy. The negative reaction of the intimate partner could be a significant contributor to the high prevalence of prenatal stress. According to Mapunda et al. (2022), in a study done in Tanzania, conflicts between pregnant women and their intimate partner is one of the barriers to male involvement in ANC. The negative reactions of the intimate partner are evidence of conflict. These findings concluded that an unplanned pregnancy is a significant contributor to prenatal stress.

This study revealed that IPV is a predictor of prenatal stress. The results of this study depicted that 18.6% of respondents experienced IPV and among this group, 65.3% had prenatal stress. This was similar to a study done in Migori County, a rural part of Kenya, which showed that the prevalence of IPV was 18.2%. The study also showed that the prevalence of prenatal stress among the group was 75.4%, which was higher than in the current study (Andhavarapu et al., 2021). The disparities could have been caused by cultural and environmental differences since the previous study was done in a rural setting, while the current study was done in an urban setting.

The study revealed that respondents experience different types of IPV including physical violence, emotional violence, economic violence, and sexual violence. The same types of IPV were experienced by pregnant women in Ethiopia Arba Minch Town Government Institution and the prevalence of IPV (Deksisa et al., 2020). In the current study, most of the respondents experienced physical violence 37.25%, and emotional and economic violence was 27.45% and 25.50% respectively. Only 9.8% of the respondents reported sexual violence. Sexual violence was low possibly because of African cultural practices where talking about sex is prohibited

such that some women may be suffering sexual violence silently. Some women may also not realize when they are sexually abused as they think men have all the rights over their bodies, either due to their socialisation or cultural factors.

This research discovered that 79.6% of respondents who experienced IPV did not report their intimate partner to the relevant authority, and only 20.4% reported. The research further revealed that 66.7% of those who never reported did not want to report their intimate partner to relevant authorities. Additionally, 25.6% of respondents reported that they were afraid to report their intimate partners and only 7.7% reported that they did not know where to report. This was comparable to a study done by the Sexual Violence Research Initiative (2022) in Kenya, which revealed that 53% of women agreed that women should tolerate violence to keep their family together and 37% agreed that a woman should keep silent when experiencing violence from her husband. This finding showed a trend where many pregnant women experience recurrent IPV but most of them do not report these cases that can lead to death or morbidity of such women or their unborn child. Creating awareness about the consequences of being silent about IPV can reduce these cases.

Lack of social support was revealed to be a weak contributor to prenatal stress. This study indicates that the prevalence of prenatal stress was 50.25% among women who reported a lack of social support, which was almost the same as those who reported they were supported (50%). On the contrary, a study conducted by Tang et al. (2019) noted that pregnant women who had low and moderate social support were more likely to develop prenatal stress than those who had a high level of social support. A study done in Thailand also gave contradicting findings, which stated that Thai women have low prenatal stress due to their culture of enhancing family, community, and social connectedness, thus increasing the social support a pregnant

woman receives (Thongsomboon et al., 2020). In the current study, respondents reported that they received social support from different people around them such as intimate partners, parents, parents-in-law, siblings, the community, and the church. However, despite reporting that they received social support, their prevalence of prenatal stress was 50%, plausibly because the support they received could not make them less overwhelmed, hence not reducing their level of stress.

Stressful life events were significant contributors to prenatal stress since any stressful life event leads to an increase in prenatal stress in pregnant women. This has been revealed by this study, which depicted that 65.3% of respondents experienced prenatal stress due to stressful life events that they underwent. This corresponds with research conducted by Kinser et al. (2018) and Dolatian et al. (2016), which stated that pregnant women who experienced stressful life events such as the death of a loved one or trauma during pregnancy had an increased risk of prenatal stress. Loss of a job was a major stressful event reported by respondents in selected ANC clinics in Nairobi County. Stressful events reported were the loss of a job, death of a spouse, death of a child, death of a parent, and divorce. Furthermore, some respondents, when asked to list down other issues that make them overwhelmed and stressed, added having a sick parent or child, loss of previous pregnancy through miscarriage, or death of the baby during delivery.

#### Relationship between Factors Contributing to Prenatal Stress and Demographic Data

The findings showed that there was a significant relationship between unplanned pregnancy and maternal age, level of education, parity, and work status. Most respondents with unplanned pregnancies were aged between 15-24 years (55.81%). However, age and unintended pregnancy had a weak negative correlation of -0.069, which portrayed that younger women have a higher likelihood of having

unplanned pregnancies compared to older women. This was similar to studies done in Kenya by Ojuok et al. (2022) and in Japan by Huynh et al. (2020). These studies stated that women who were below 25 years old were more likely to have unintended pregnancies compared to those who were over 35 years old. This was probably because young women are more vulnerable and may engage in unprotected sex. The majority of them do not use contraceptives to protect themselves from unplanned pregnancy and those on contraceptives may not use it correctly, leading to failure. Creating awareness among young women can help them understand that unprotected sex can not only lead to unintended pregnancy but can also lead to sexually transmitted infections and HIV.

On the other hand, a study done in Tanzania concluded that unplanned pregnancy increases with age (Calvert et al., 2013). This was similar to a study done in Gambia, which showed women who were aged 40-44 years and 45-49 years had 30.1% and 40.0% unintended pregnancies respectively (Barrow et al., 2022). This is because older women might already have their ideal number of children, so an additional one is regarded as undesired. Unintended pregnancy can be reduced by encouraging all women to embrace the effective use of contraceptives.

Marital status and unplanned pregnancy had a weak positive correlation of 0.303 and a predominance of women with unintended pregnancy were married (65.12%). This finding was comparable to research done by Merga et al. (2021) in Ethiopia, which concluded that women who are married are more likely to get unintended pregnancies than single women. This was true, especially for women who wait for their husbands to make the decision for them on the use of contraceptives. Some use contraceptives without their husband's knowledge, affecting compliance and leading to failure. If male involvement is enhanced during the antenatal and post-

delivery period, they might support their wives in the use of contraceptives, hence increasing uptake and reducing failure.

Many of the women who had unplanned pregnancies were unemployed (62.79%). However, work status and unplanned pregnancy had a weak positive correlation of 0.111. Studies done in the USA and Ghana showed similar findings stating that women who were not employed were found to have a higher likelihood of having unplanned pregnancies than those who were employed or self-employed (Ameyaw, 2018; Iseyemi et al., 2017). This was possible since unemployed women are dependent, making them unable to make their own decisions about the use of contraceptives. Some may use sex to generate income for their self-care.

The relationship between unplanned pregnancy and parity had a very weak positive correlation of 0.07, with a significance level of 0.27. However, the majority of women with unplanned pregnancies were primigravida (48.84%). This was supported by studies that showed that women who were pregnant for the first time were more likely to have unplanned pregnancies compared to those who were carrying their 2nd and above pregnancy (Barrow et al., 2022; Merga et al., 2021). This may be age-related because many women who are pregnant for the first time are usually young. This makes them have the low bargaining power to demand safe sex and the use of contraceptives. They may also be on contraceptives but are not able to use them correctly, affecting their effectiveness.

Most of the women who had unintended pregnancies had secondary school level of education (38.37%), however, those at primary level had a far much lower percentage of 24.24%. The relationship between unplanned pregnancy and level of education had a weak negative correlation of -0.045, revealing that women with low-level education were more likely to have unplanned pregnancies compared to those



who have higher level education. Similarly, a study by Merga et al. (2021) depicted that young women who were illiterate and of lower education level were three times more likely to have unintended pregnancies compared to literate pregnant women. In Ethiopia and Malawi, Getu et al. (2016) and Hall et al. (2016) showed comparable findings. This is plausible because women with lower education levels are not empowered and may not have the bargaining power to demand safe sex, increasing their chances of having unplanned pregnancies.

Intimate partner violence had a statistically important relationship with maternal age, marital status, parity, level of education, and work status. IPV and age had a weak positive correlation of 0.027, and a significance level of 0.667, implying that an increase in age increases the chances of experiencing IPV. The results also showed that most of the women who experienced IPV were between the ages of 25-34 years (54.35%), which indicated that older women are more likely to experience IPV than younger women. Some studies showed a different picture, stating that older women were less likely to experience IPV compared to younger women (Lima et al., 2021; Stiller et al., 2022). The finding of the current study may be because older women are more vocal about IPV and ready to reveal their experiences than younger women. In addition, some older women may have a high likelihood of experiencing IPV since they may be financially dependent on the perpetrator, making them continue living in an abusive relationship. Creating awareness of the consequences of IPV, where to report the cases, and encouraging victims to report can reduce these cases of IPV.

Level of education and IPV had a weak positive correlation of 0.111. Furthermore, the results showed that the predominance of women who experienced IPV was at secondary level (43.48%). This was comparable to a study done in the

USA, which showed that women with middle level education had the possibility of experiencing IPV (Carmichael et al., 2019). This disclosed that education level does not protect from IPV. Inversely, studies done by Morris et al. (2020) and Stiller et al. (2022) revealed that pregnant women who had no education and those who had a primary level of education had high odds of experiencing IPV compared to those with secondary and tertiary education. The assumption was that a woman with a low education level may not know their rights, hence making them abused. They may also have less bargaining power to resist abuse. On the other hand, this study has affirmed that education does not protect someone from experiencing IPV. Educating all women about IPV regardless of their education level could be beneficial.

Marital status and IPV had a weak positive correlation of 0.198. However, a large percentage of women who experienced IPV were married (78.26%), showing that women who are married had the highest likelihood of experiencing IPV. On the contrary, Stiller et al. (2022) found that women who were single, divorced, and cohabiting were more likely to experience IPV than their married counterparts. According to the current study, married women might have high odds of experiencing IPV probably because they depend on their husbands for financial support, making them oblige to abusive treatment from their spouses. In some African cultures, married women believe that their husbands have all rights to their bodies, making them accept abuse without question.

Parity and IPV had a weak negative correlation of -0.103, showing that the higher the parity the lower the odds of experiencing IPV. A study done by Stiller et al. (2022) showed comparable results, where pregnant women with more than one baby had low odds of experiencing IPV, displaying that children acted as protection against IPV. On the other hand, in Uganda, Katushabe et al. (2022) observed that women who

had more than one child have a higher likelihood of disclosing that they are experiencing IPV than those who are carrying a pregnancy for the first time. This revealed that the low odds of primigravida experiencing IPV might be because they do not disclose that they are experiencing it. A primigravida might be newly married and might still have hopes that her intimate partner might change.

Work status and IPV have a weak positive correlation of 0.083, and the majority of pregnant women who experienced IPV were unemployed (43.48%). This finding was similar to a study done by Morris et al. (2020), which stated that women who were unemployed or not working had a very high likelihood of experiencing IPV. The findings were consistent probably because unemployed women depend on their intimate partner for financial support. This makes them vulnerable and have less bargaining power to resist abuse due to fear of losing that support.

Lack of social support and demographic data showed a weak positive relationship with maternal age, parity, work status, marital status, and level of education. Lack of social support and age had a weak positive correlation of 0.11. The results also showed that a majority of pregnant women who felt like they lacked social support were between the ages of 25-24 years (50%). This was different from a study done by Bidzan (2013), which indicated that young women who were 18 years and below were less likely to receive social support from their significant others. A study by Lutkiewicz (2020) in Poland also contradicted the results of this study, where older women who were 30 years and above were found to have a stable network that enhanced their social support. The current research may have a different finding probably because of the sample size where women who were 24-34 years old were the majority. Additionally, older women might be more vocal about their lack of social support than younger women.

In the current study, marital status and lack of social support had a weak positive correlation of 0.056, and most of the women who reported lack of social support were married (75%). Other studies showed contrary findings, for instance, a study done in Iran showed that women who were married received better social support than those who were single, divorced, or cohabiting (Abdi et al., 2022). Another study done by Taylor et al. (2022) in England also revealed that women who were not living with their intimate partner reported lower social support than married women. The current study had a different finding probably due to the fact that these married women might be in unstable marriages, making them feel neglected and lack social support.

Marital status and lack of social support had a weak positive correlation of 0.039, implying that the higher the level of education the higher the lack of social support. In addition, the study showed that women who had a secondary level of education were the most likely to report lack of social support (53.57%). Studies by Lutkiewicz (2020) and Schappin et al. (2013) contrasted with the current study. The studies showed that women with a higher level of education had good social networks, which enhanced their social support. The current study revealed that having higher education and a better social network does not guarantee adequate social support. This is plausible since more educated women might have a better understanding of the support they need from their significant other, and they may be more vocal if that support is not granted.

### Conclusion

The study revealed that the prevalence of prenatal stress was high among pregnant women in selected ANC clinics in Nairobi County. This means that when prenatal stress is not assessed during routine ANC visits, this condition is left

undiagnosed. Preterm labour and other conditions may be caused by untreated prenatal stress.

Unplanned pregnancy is a significant contributor to prenatal stress among pregnant women in selected ANC clinics in Nairobi County. Most of the pregnant women with unplanned pregnancies were not on any contraceptives when they got pregnant, implying that they either lacked knowledge about the use of contraceptives or had some myths that prevented them from using them. Some respondents used contraceptives, which later failed, making them prone to prenatal stress. This means that they may have lacked knowledge about the effective use of contraceptives. Negative reactions and feelings about the unplanned pregnancy from the respondent and the intimate partner increased the possibility of suffering from prenatal stress. Psychological support may have probably reduced their level of stress.

Intimate partner violence is an important predictor of prenatal stress. Pregnant women who experienced IPV had a high prevalence of prenatal stress. Physical violence was the highest type of IPV reported by pregnant women in this study. It was concluded that many women who experience IPV were not willing to report their partner to relevant authorities, making them abused continuously, leading to death or morbidity of both the woman and her unborn child. Some women did not know where to report the perpetrators of IPV, thus they need to be empowered so that they know where to report these cases.

Support for a pregnant woman is considered an important element in the improvement of the physical strength and mental health of a pregnant woman. Furthermore, with effective social support, the body and mind is comfortable, thus reducing prenatal stress. The study indicated that the majority of pregnant women were able to get social support from their intimate partners. The finding showed that

the prevalence of prenatal stress between those who lacked and those who received social support was almost the same. However, according to the transactional model of stress and coping theory, social support is one of the important aspects that can reduce the level of stress.

Stressful life events were a significant predictor of prenatal stress. Pregnant women who experienced stressful life events during pregnancy had high prenatal stress. The different stressful life events identified in this study were loss of job, death of parents, death of spouse, death of child, and divorce. In addition, having a sick parent, sick child or parent, and loss of a previous pregnancy were also mentioned in this study. Stressful life events affect a pregnant woman psychologically, making her suffer from prenatal stress. However, women who are adequately supported by their significant others during this period have a low level of prenatal stress. Even though some of these events cannot be prevented, social and psychological support during this period is important.

#### Recommendations

Prenatal stress should be assessed during routine ANC visits. This would help healthcare providers identify pregnant women with a high level of prenatal stress. Pregnant women with a high level of prenatal stress should undergo counselling, where factors contributing to prenatal stress are identified and risk-specific strategies applied. This would help in reducing her level of prenatal stress, hence lowering her chances of having preterm labour. All ANC clinics should have a professional counsellor to give the needed psychological support.

Pregnant women should be given health education of effects of prenatal stress and stress management skills.

The study suggested that a reduction in unplanned pregnancies among pregnant women can lead to a decrease in prenatal stress. This can occur by the use of effective family planning methods. Women in Nairobi County should be educated on the importance of using contraceptives and recommending the best methods for them. They should also be educated on the effective use of contraceptives to reduce their failure rate. Unplanned pregnancy tends to increase conflicts between the woman and her intimate partner, therefore, it is necessary for them to go for counselling so that they can be helped accept their situation. On the other hand, for young women below the age of 18 years, there should be a mentorship program that educates them on the best practices to reduce early marriages and single parenthood. Male involvement should also be encouraged during pregnancy and when a woman is seeking family planning care. This can improve the uptake and effectiveness of contraceptives. All women with unplanned pregnancies need psychological support, which can be provided during routine ANC visits.

Awareness about different types of IPV and its consequences should be done for all women in Nairobi County. They should also be encouraged to report any case of IPV they may experience. They should be educated so that they know who they should report to in case they experience IPV. The women should also undergo counselling so that they can open up and be able to deal with their pain.

Social support has been identified as an important element in the reduction of prenatal stress. Intimate partner support is significant in the reduction of prenatal stress and the improvement of the woman's health. However, intimate partner support is minimal for single women who are pregnant. Therefore, it is recommended that they seek support from their parents, siblings, communities, and church instead of solving the challenges alone. This will reduce prenatal stress among the pregnant

women. Male involvement during the care of a pregnant woman should be enhanced since it can help in the reduction of prenatal stress. Health facilities should provide counselling services to all pregnant women who are willing to seek these important services.

Losing something or someone valuable in the family affects the stability and health of a pregnant woman. The analysis indicates that stressful life events lead to prenatal stress among pregnant women. Women who have undergone stressful life events should be given adequate social support and counselling services during routine ANC visits.

#### Recommendations for Further Research

The aim of the study was to investigate factors contributing to prenatal stress among pregnant women attending selected antenatal clinics in Nairobi County. Therefore, since there are 47 counties in Kenya, there should be further research on the same topic under this study in the other 46 counties in Kenya. The factors that contribute to prenatal stress, according to the current study, were unplanned pregnancy, IPV, lack of social support, and stressful events, thus there should be further study on other factors contributing to prenatal stress. Male partners can also be included in the research as respondents.

#### Summary

The chapter presented a discussion of the results of this study in comparison with previous studies to give a better understanding of the knowledge gained from the study. Conclusions have revealed some of the most significant findings that show the relevance of this research. In the recommendations section, the researcher has shown



realistic suggestions to bring solutions to identified issues. The researcher has also pointed out areas that need further research.

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## APPENDICES

## Appendix A: Introduction Letter

My Name is Tabitha Wamucii a daystar student taking masters in counselling psychology. My student number is 19-0024. My thesis topic is factors contributing to prenatal stress among pregnant women in Nairobi County ANC clinic in selected level 3 hospitals. The purpose of this study is to investigate factors contributing to prenatal stress among pregnant women in Nairobi County ANC clinics. Identification of these factors might help health care workers to develop risk specific strategies in management of prenatal stress.

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Appendix B: Informed Consent

Adult and emancipated minor informed consent

I..... (Initials) have been informed about the significant, purpose and benefits of this study and I have willingly accepted to participate. I was also informed that the information I will give in this study, will only be used for study purposes and it will not be shared with unauthorized person. I have also understood that I can withdraw from participating in this study at any stage.

Signature.....

Date.....

Concept for Pregnant minor with a parent/guardian

I..... (Initials) Parent/guardian to ..... (Minor's initials) have been informed and understood the purpose, significance and the benefit of this study and I have willingly agreed ..... (Minor's initials) to participate in the study. The information given in this study will only be used for study purposes and will not be shared with unauthorized person. I also understand that ..... (Minor's initials) can withdraw from participating in the study at any stage.

Signature.....

Date.....

I ..... (Minor's initials) have willingly agreed to participate to participate in this study.

Signature.....

Date.....

## Appendix C: Questionnaire

Serial Number ..... VISIT .....

## Part one: Demographic data

Please tick in the box the appropriate answer

1. Age  Below 15yrs 15 – 24yrs 25 – 34yrs Above 35yrs

2. Marital status:

 Married Cohabiting Single Separated Divorced Widowed

4. Level of education:

 Primary level Secondary Level Tertiary level (College/ university)

5. What is your work status?

 Employed Self-employed Unemployed

6. Which number of pregnancies are you carrying (Parity)?

 First pregnancy 2<sup>nd</sup> – 5<sup>th</sup> Pregnancy 6<sup>th</sup> and above

7. What is the status of your pregnancy?

- Planned  
 Unplanned

If unplanned,

i) Were you on any family planning method?

- Yes  No

ii) How did you feel when you discovered you were pregnant?

- Happy  unhappy  I can't really tell what I felt

iii) What was the reaction of your intimate partner when he discovered you are pregnant?

- He does not know about the pregnancy  
 Is happy about the pregnancy and supporting  
 Does not want anything to do with the pregnancy

8. Have you experienced intimate partner violence during this pregnancy?

- Yes  No

i) If yes, what kind?

- Physical violence  
 Sexual violence (forced to have sex against my will)  
 Emotional violence (being abused or humiliated)

ii) Did you report the case of violence to relevant authority?

- Yes  No

iii) If no, what were your reasons?

- I did not want to report him  I did not know where to report to  
 I was afraid



9) Do you feel adequately social supported during this pregnancy?

Yes

No

i) Who can you depend on when you need help?

No One

My intimate partner

My Parent in-law

My Parent

Others (friends, community, church)

ii) Who can you really count on to help you feel better when you are feeling down?

No One

My intimate partner

My Parent in-law

My Parent

Others (friends, community, church)

iii) Who can you count on to console you when you are very upset?

No One

My intimate partner

My Parent in-law

My Parent

Others (friends, community, church)

10) Have you experienced stressful life event during this pregnant?

Yes

No

i) If yes, please tick the stressful life event that you experienced

Death of a spouse

Death of your child

Death of your parent

Divorce

Loss of a job

iii. During that period you experienced stressful life event, did you have someone who supported you?

Yes

No

11) Please write down in the space given below some of other issues which are not mentioned above that make you stress and overwhelmed.

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## Part Two: Perceived Stress Scale 10

Please Tick the appropriate answer

Question	0=Never	1=Almost never	2= Sometimes	3=Fairly often	4=Very often
1. In the last month, how often have you been upset because of something that happened unexpectedly?					
2. In the last month, how often have you felt that you were unable to control the important things in your life?					
3. In the last month, how often have you felt nervous and "stressed"?					
4. In the last month, how often have you felt confident about your ability to handle your personal problems? ....					
5. In the last month, how often have you felt that things were going your way?					
6. In the last month, how often have you found that you could not cope with all the things that you had to do?					
7. In the last month, how often have you been able to control irritations in your life?					
8. In the last month, how often have you felt that you were on top of things?					
9. In the last month, how often have you been angered because of things that were outside of your control?					
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?					

## Appendix D: Study Budget

No.	Item	Quantity	Cost in Kenya shillings	Total cost
1	Stationary	10 rims of printing papers	@ 600	6,000
		20 pens	@ 20	400
2	Note book	4	@ 120	480
3	Printing proposal	60 pages x 1	@ 10 per page	600
	Printing research project	131 pages x 8	@ 10 per page	10,000
	Editing research project			20,000
4	Binding	10 books	@ 200	2,000
	Binding final research	2 books	@ 1000	2,000
5	Lunch	20 days	@ 500	10,000
6	Travelling	To selected Facility for 20 days	@ 500	10,000
7	Internet bundles	30 GB	@ 1GB 250	7,500
8	Contingencies	10% of total		6,898
Totals				75,878

## Appendix E: Work Plan for the Study

TASK	June 2022	July 2022	August 2022	September 2022 To December 2022	January 2023 To August 2023
Proposal writing and defense					
Approval processes					
Pretesting of research instrument					
Data collection					
Data analysis					
Writing of the whole thesis					
Thesis defense and dissemination of results					

## Appendix F: Ethical Clearance

**VERDICT – APPROVED WITH COMMENTS**

Daystar University Institutional Scientific and Ethics Review Committee (DU-ISERC)

Our Ref: **DU-ISERC 01/09/2022/000711**Date: 1<sup>st</sup> September 2022

To: Tabitha Wamucii

Dear Tabitha,

**RE: FACTORS CONTRIBUTING TO PRENATAL STRESS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINICS IN NAIROBI COUNTY**

Reference is made to your ISERC application reference no. 220822-05 dated 22<sup>nd</sup> August 2022 in which you requested for ethics approval of your proposal by Daystar University Institutional Scientific and Ethics Review Committee.

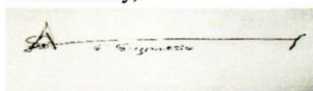
We are pleased to inform you that ethics review has been done and the verdict is to revise, to the satisfaction of the Supervisors and Head of Department. As guidance, ensure that the attached comments are addressed. Please be advised that it is an offence to proceed to collect data without addressing the concerns of the Institutional Scientific and Ethics Review Committee. Your application approval number is **DU-ISERC-000711**. The approval period for the research is between **1<sup>st</sup> September 2022 to 31<sup>st</sup> August 2023** after which the ethical approval lapses. Should you wish to continue with the research after the lapse, you will be required to apply for an extension from DU-ISERC at half the review charges.

This approval is subject to compliance with the following requirements.

- i. Only approved documents including (informed consents, study instruments, MTA) will be used.
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by Daystar University Institutional Scientific and Ethics Review Committee.
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to Daystar University Institutional Scientific and Ethics Review Committee within 72 hours of notification.
- iv. Any changes anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to Daystar University Institutional Scientific and Ethics Review Committee within 72 hours.
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of a signed one-page executive summary report and a closure report within 90 days upon completion of the study to Daystar University Institutional Scientific and Ethics Review Committee via email [duerb@daystar.ac.ke].

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

Yours sincerely,



Sr. Prof. A.L. Lando PhD  
**Chair**, Daystar University Institutional Scientific and Ethics Review Committee



Encl. Review Report



Nairobi Campus  
P.O. Box 44400 - 00100, GPO  
Nairobi, Kenya.

Atithi River Campus  
P.O. Box 17 - 90145  
Atithi River, Kenya.

Tel: 0709 972 000  
0716 170 313  
0748 100 759  
0724 256 408

Email: admissions@daystar.ac.ke OR  
info@daystar.ac.ke

Website: www.daystar.ac.ke

...until the day dawn and the  
**DAYSTAR** arise in your hearts"  
2 Peter 1:19 KJV

Appendix G: Research Permit

  
REPUBLIC OF KENYA

  
NATIONAL COMMISSION FOR  
SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 263814 Date of Issue: 14/October/2022

**RESEARCH LICENSE**



This is to Certify that Miss.. Tabitha Wanjiru Wamucii of Daystar University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: **FACTORS CONTRIBUTING TO PRENATAL STRESS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINICS IN NAIROBI COUNTY** for the period ending : 14/October/2023.

License No: NACOSTI/P/22/20785

263814  
Applicant Identification Number

  
Director General  
NATIONAL COMMISSION FOR  
SCIENCE, TECHNOLOGY &  
INNOVATION

Verification QR Code



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Scan the QR Code using QR scanner application.

See overleaf for conditions

**THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)**  
Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

**The National Commission for Science, Technology and Innovation**, hereafter referred to as the Commission, was established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

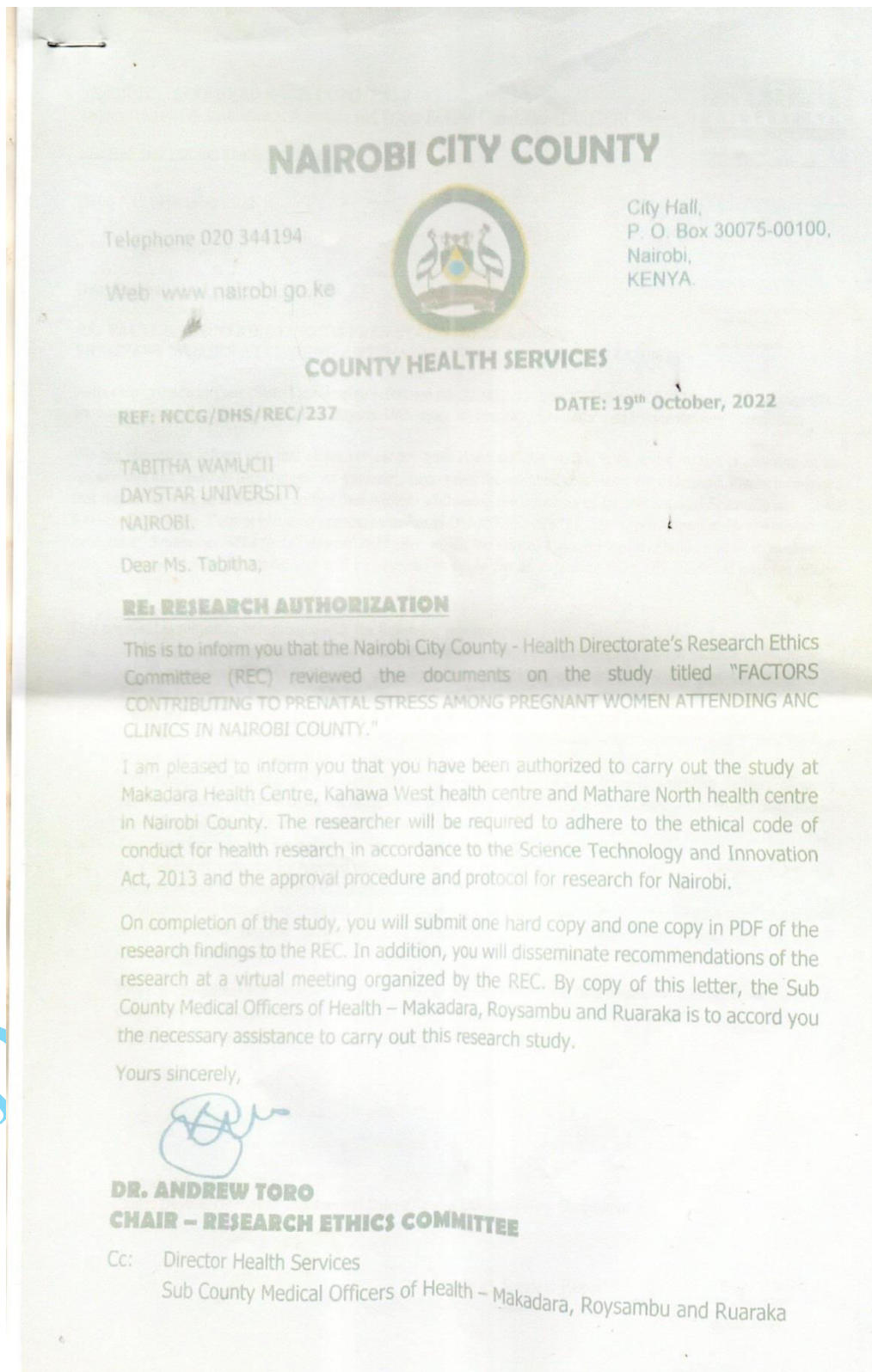
**CONDITIONS OF THE RESEARCH LICENSE**

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
  - i. Endanger national security
  - ii. Adversely affect the lives of Kenyans
  - iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
  - iv. Result in exploitation of intellectual property rights of communities in Kenya
  - v. Adversely affect the environment
  - vi. Adversely affect the rights of communities
  - vii. Endanger public safety and national cohesion
  - viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. The license any rights thereunder are non-transferable
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and  
Innovation(NACOSTI),  
Off Waiyaki Way, Upper Kabete,  
P. O. Box 30623 - 00100 Nairobi, KENYA  
Telephone: 020 4007000, 0713788787, 0735404245  
E-mail: dg@nacosti.go.ke  
Website: www.nacosti.go.ke




## Appendix H: Research Authorization Letter from Nairobi County



Appendix I: Permission from Sub-Counties

**NAIROBI CITY COUNTY**

Telephone 020 344194  
 Web: www.nairobi.go.ke



City Hall,  
P. O. Box 30075-00100,  
Nairobi,  
KENYA

**COUNTY HEALTH SERVICES**

REF: NCCG/DHS/REC/237 DATE: 19<sup>th</sup> October, 2022

TABITHA WANJICHI  
 DAYSTAR UNIVERSITY  
 NAIROBI.

Dear Ms. Tabitha,


**RE: RESEARCH AUTHORIZATION**

This is to inform you that the Nairobi City County - Health Services Research Ethics Committee (REC) reviewed the documents on the study titled "FACTORS CONTRIBUTING TO PRENATAL STRESS AMONG PREGNANT WOMEN ATTENDING ANC CLINICS IN NAIROBI COUNTY."

I am pleased to inform you that you have been authorized to carry out the study at Makadara Health Centre, Kahawa West health centre and Mathare North health centre in Nairobi County. The researcher will be required to adhere to the ethical code of conduct for health research in accordance to the Science Technology and Innovation Act, 2013 and the approval procedure and protocol for research for Nairobi.

On completion of the study, you will submit one hard copy and one copy in PDF of the research findings to the REC. In addition, you will disseminate recommendations of the research at a virtual meeting organized by the REC. By copy of this letter, the Sub County Medical Officers of Health - Makadara, Roysambu and Ruaraka is to accord you the necessary assistance to carry out this research study.

Yours sincerely,



**DR. ANDREW TORO**  
**CHAIR - RESEARCH ETHICS COMMITTEE**

Cc: Director Health Services  
 Sub County Medical Officers of Health - Makadara, Roysambu and Ruaraka

*Handwritten notes:*  
 Approved For School -  
 cc: Facility in charge  
 Mathare North  
 4/11/2022

*Stamp:*  
 COUNTY HEALTH ADMIN. OFFICER  
 SUB-COUNTY  
 NAIROBI  
 19 OCT 2022

## Appendix J: Plagiarism Report

# Tabitha Wamucii Thesis

by Tabitha Wamucii

Submission date: 01-Sep-2023 11:42AM (UTC+0300)

Submission ID: 2155628000

File name: Tabitha\_Wamucii\_Thesis.docx (378.09K)

Word count: 25951

Character count: 138896

DAYSTAR UNIVERSITY

## Tabitha Wamucii Thesis

## ORIGINALITY REPORT

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