

**RISK AND PROTECTIVE FACTORS OF POSTPARTUM
ANXIETY IN MOTHERS ATTENDING THE PEDIATRIC
DEMONSTRATION UNIT AT THE KENYATTA NATIONAL
HOSPITAL**

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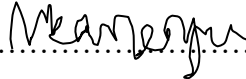
H58/11086/2018

A research dissertation submitted to the Department of Psychiatry in partial fulfillment for the award of the Master of Medicine in Psychiatry at the University of Nairobi

2020

Declaration

The undersigned, declare that this dissertation is my original own work and has not, to the best of my knowledge, been submitted either wholly or in part to this or any other university for the award of any degree.

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List of Abbreviations

APA	American Psychiatric Association
C – GHQ	Chronicity and the GHQ
CMD	Common Mental Disorders
CPMD	Common Perinatal Mental Disorders
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, 5 th Edition
EPDS	Edinburgh Perinatal Depression Scale
EPDS-3A	Edinburg Postnatal Depression Scale – Anxiety Subscale
ERC	Ethics and Research Committee
GAD	Generalized Anxiety Disorder
GHQ	General Health Questionnaire
HADS	Hospital Anxiety and Depression Scale
HIV	Human Immunodeficiency Virus
IPV	Intimate Partner Violence
K-10	Kessler – 10
KNH	Kenyatta National Hospital
LMIC	Lower Middle Income Countries
OCD	Obsessive-Compulsive Disorder
PI	Principal Investigator
PDU	Pediatric Demonstration Unit
PPA	Postpartum Anxiety
PPD	Postpartum Depression
PSI	Postpartum Support International
SPSS	Statistical Package for the Social Sciences
STAI	State-Trait Anxiety Inventory
UON	University of Nairobi
WHO	World Health Organization

Operational Definitions of Terms and Phrases

Anxiety – a feeling of apprehension and fear

Perinatal period – period of pregnancy and the first year postpartum

Postpartum period – period of one year after delivery of a baby

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ABSTRACT

Introduction: The prevalence of anxiety disorders among postpartum women is higher than that in the general population at approximately 20% - 25% with consequences of postpartum anxiety associated with difficulties in parenting abilities and cognitive and developmental difficulties to the child. Risk and protective factors of postpartum anxiety have been associated with varying maternal social and demographic characteristics. Fewer studies in Africa have focused on postpartum anxiety with currently no study done in Kenya on the risk and protective factors of postpartum anxiety.

Study Objectives: The main objective of this study was to determine the prevalence and factors associated with postpartum anxiety among mothers at the Pediatric Demonstration Unit at Kenyatta National Hospital.

Methodology. This was a cross-sectional study at the Kenyatta National Hospital Pediatric demonstration unit. Mothers were recruited after giving informed consent and data collected using the Hospital Anxiety and Depression Scale (HADS) and a Structured Questionnaire.

Study Population: Data was collected from 131 mothers recruited via systematic sampling at the Pediatric Demonstration Unit at the Kenyatta National Hospital.

Data analysis: Data collected was analyzed using SPSS version 22.0 after being cleaned for errors and inconsistencies.

Results: A total of 131 mothers were recruited into the study. The percentage of mothers with postpartum anxiety was 40.5% (n=53). The mean, median, SD of anxiety scores was 7.0, 6.0, and 3.4 respectively. 78 (59.5%) of the mothers had no anxiety, 34 (26.0%) had mild anxiety, 15(11.5%) had moderate anxiety and 4(3%) had severe anxiety. Forty-two (32.1%) participants had depression and comorbidity of anxiety and depression was observed in 23 (17.6%) of the participants. The risk factors associated with postpartum anxiety were considering oneself an anxious person ($p < 0.001$), awareness of a mother's ability to deal with the stress and worries of being a new mother ($p = 0.024$), and depression ($p = 0.001$). No protective factors were identified from this study.

Conclusion: The prevalence of postpartum anxiety in mothers attending the Pediatric Demonstration Unit at Kenyatta national hospital was significantly high compared to that of depression and that of anxiety in the general population. While there were no protective factors identified, risk factors associated with postpartum anxiety were awareness of the ability to deal with stress, considering oneself an anxious person, and depression.

CHAPTER 1

1.0 INTRODUCTION

1.1 Background

The postpartum period is a period of transitions that are often overwhelming and stressful (Fallon, Halford, Bennett, & Harrold, 2016). This temporary transition period involves concerns that include postpartum attitudes towards weight increase and body image (Walker & Freeland-Graves, 1998), interpersonal relationships (Hiser, 1991), infants health, wellbeing, and general infant care (Lugina, Nyström, Christensson, & Lindmark, 2004; Warren, 2005). While these concerns are not unusual, for some women they may lead to postpartum mood disorders that often involve elevated anxiety (J. S. Lonstein, 2007). These concerns are brought about by changes in hormonal levels that occur during and after delivery and result in labile emotions and increased mental health risks for new mothers (Robertson, Grace, Wallington, & Stewart, 2004). Biological correlates of elevated postpartum anxiety include ovarian and adrenal steroids, prolactin, oxytocin, NE, Serotonin (J. Lonstein, Maguire, Meinschmidt, & Neumann, 2014).

According to the current 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), there is no distinct diagnosis for postpartum anxiety. However, its symptom profile is most often similar to symptoms of anxiety disorders that occur outside the postpartum period with the most frequent types of anxiety disorders being Generalized anxiety disorder (GAD) and Obsessive-Compulsive Disorder (OCD) (Pawluski et al., 2017). Postpartum anxiety (PPA) has been defined as anxiety occurring within the first twelve months postpartum (Leach, Poyser, & Fairweather-Schmidt, 2017) causing mothers to experience extreme fears and worries that are centered on the health and safety of the baby (PSI International, 2016). Mothers living with PPA complain of physiologic symptoms of restlessness, insomnia, racing heart, irritability, and panic attacks that are associated with intrusive thoughts, worry, fear, phobias and a sense of dread (Ali, 2018). Anxiety symptoms are commonly comorbid with depressive symptoms and in the postpartum period these symptoms are significantly correlated with each other (Peñacobapiente, Marín-Morales, Carmona-Monge, & Velasco Furlong, 2016).

According to different literature, PPA prevalence estimates have ranged from 13% to 40% (Field, 2017). In a study done in United States the prevalence rates of PPA were found to be 6%

using the Edinburg Postnatal Depression Scale (EPDS) and 17% using the State-Trait Anxiety Inventory (STAI) (Paul, Downs, Schaefer, Beiler, & Weisman, 2013a). In Vancouver, British Columbia a study done in postpartum mothers at different weeks in the postpartum found the prevalence rates of PPA were 22.6%, 17.2% and 14.8% at weeks 1, 4, and 8 respectively (C. L. Dennis, Coghlan, & Vigod, 2013). In the state of Qatar, the prevalence of PPA was at 13.1% (Bener, Gerber, & Sheikh, 2012). In another study done in Israel of PPA in a cohort of women recruited from the general public, approximately 40% of women postpartum, suffered severe anxiety (Polachek, Harari, Baum, & Strous, 2014). A systematic review of prenatal and postpartum psychological wellness in African women living in Africa discovered a prevalence of 14% for postnatal anxiety (Sawyer, Ayers, & Smith, 2010). In Sub-Saharan Africa, studies done in West Africa have found anxiety levels in the postpartum period to have varied depending on the time postpartum. In Nigeria the point prevalence rates for PPA at weeks 1, 4, 8 were found to be 28.1%, 17.9%, 10.2% respectively (Adewuya & Afolabi, 2005a). A study on mothers in Ghana and Cote D'Ivoire around the perinatal period found that 79.8% of women had persistently low anxiety symptoms, prior to and after childbirth 11.4% of the women had high anxiety scores which gradually decreased while 5.4% had symptoms that worsened over time. Only about 3.3% of women experienced transient anxiety with high scores three and twelve months after delivery (Barthel, Kriston, Barkmann, Appiah-Poku, Te Bonle, Yao, Carine, Jean Armel, et al., 2016).

PPA has been linked with poor mother infant attachment and bond, postpartum depression (PPD), lower chances of breastfeeding, difficult and delayed social and cognitive development, higher risks of infant abuse as well as higher risks of childhood anxiety (Britton, 2008; Britton & Ph, 2008; Dennis, 2006; Fairbrother, Young, Janssen, Antony, & Tucker, 2015; Kingston, Tough, & Whitfield, 2012). Moreover, mothers with PPA tend to be less responsive and less engaged with their babies who are likely to be more withdrawn and have less positive emotional tone (Stein et al., 2012). Furthermore postpartum anxiety in the first few days after delivery has been linked to an increased incidence of postpartum depression among mothers (Teissedre & Chabol, 2003).

Postpartum anxiety has been associated with various risk factors as well as protective factors (Fisher et al., 2012). A study done in West Africa on the course of perinatal anxiety found

antepartum depressive symptoms to be a risk factor associated with development of anxiety in the postpartum period. It also found higher levels of marital, economic and social stress as well as multiparity and lower child weight to increase the risk of anxiety in the period around childbirth (Barthel, Kriston, Barkmann, Appiah-Poku, Te Bonle, Yao, Carine, Jean Armel, et al., 2016). According to a systematic review summarizing the determinants of non-psychotic common perinatal mental disorders (CPMDs) among women living in low and middle income countries (LMICs), potential risk factors included social economic factors such as low social economic status, younger age, being unmarried, an unplanned pregnancy, hostile in-laws, belonging to an ethnic minority group, lacking sufficient emotional and practical support, a history of mental illness and in some settings giving birth to a baby girl (Fisher et al., 2012). A study in West Africa found Protective factors included being more educated, having permanent employment and coming from an ethnic majority (Fisher et al., 2012).

A large number of women in their postpartum period do not meet diagnostic criteria for specific anxiety disorder but have been shown to experience significant anxiety symptoms that are distinct from anxiety symptoms experienced at any other time in their lives (Huizink, Mulder, Robles De Medina, Visser, & Buitelaar, 2004).

1.2 Problem Statement

The postpartum period is especially difficult both for new-onset anxiety and for exacerbating existing anxiety disorders (C. L. Dennis, Coghlan, & Vigod, 2013). The prevalence of PPA has been reported to range from 13% to 40% in various studies (Field, 2017) with a prevalence of 33% in Nigeria (Agbaje et al., 2019) to 10% in Egypt (Wassif, Abdo, Elawady, Elmaksoud, & Eldesouky, 2019). The consequences of PPA are associated with poor infant growth and cognitive development as well as increased risk of psychiatric disorders like child anxiety. In addition to the implications for the infant, mothers with maternal anxiety may have difficulty trusting in normal maternal signals, which contributes to difficulty bonding with their infants (Giallo, Cooklin, Dunning, & Seymour, 2014). Anxiety can dramatically interfere with parenting ability by limiting activities, generating irrational expectations or causing mothers to take alcohol or smoke cigarettes to self-medicate (Breitkopf et al., 2006; Park et al., 2009). PPA has been linked to a higher risk of postpartum depression in mothers, especially in the early postpartum period.

A variety of risk factors may contribute to PPA such as being a younger mother, poverty, being single and from a poor social support system as well as having a history of a mental illness (Fisher et al., 2012). Factors reported to protect one from developing PPA include partner support, having more education, being in stable employment and coming from an ethnic majority (Barthel, Kriston, Barkmann, Appiah-Poku, Te Bonle, Yao, Carine, Ekissi, et al., 2016; Fisher et al., 2012).

A study by World Health Organization (WHO) report on global prevalence of mental illnesses, showed that approximately three quarters of severe mental illness cases in low and middle income nations go untreated (Demyttenaere et al., 2004) furthermore, Sub-Saharan Africa has a large burden of mental disorder (Meyer & Ndetei, 2015). In the peripartum period, anxiety and depression disorders are often comorbid which hinders both detection and treatment of anxiety disorders (Furtado, Van Lieshout, Van Ameringen, Green, & Frey, 2019). Most studies locally have put more focus on PPD with no studies on PPA in Kenya. This study will seek to investigate the prevalence, risk and protective factors associated with postpartum anxiety and address the importance and need for screening and treatment of PPA during the postpartum period should a gap be identified .

CHAPTER 2

2.0 LITERATURE REVIEW

2.1 Epidemiology Of postpartum anxiety

Across the world, non-psychotic perinatal mental illnesses are common (Howard et al., 2014). Approximately 10% of pregnant women and 13% of postpartum women in high income countries suffer a mental illness, mainly depression or anxiety (Michael, Swain, Hara, & Swain, 2009)(Hendrick, 1998). A systematic review of women from low and lower middle income nations found higher rates of common perinatal mental disorders (CPMDs) than women from high-income countries, with a weighted mean prevalence of CPMDs among pregnant women of 15.6% and 19.8% among postpartum women. According to a review of literature, the prevalence of anxiety disorders was identical among postpartum women and women in general (5-12%) (Radoš, Tadinac, & Herman, 2018). However considering methodological issues such as low involvement of mothers with obstetric and neonatal complications the statistics could be even higher, approximately 20% - 25%. (J. S. Lonstein, 2007). In the United States between 8-12% of the 4 million parturient mothers suffer from a postpartum anxiety disorder each year, with OCD and GAD being the most common; comparable proportions have been observed in Germany and Canada (Fairbrother, Janssen, Antony, Tucker, & Young, 2016; Reck et al., 2008). The prevalence of postpartum anxiety was found to be 13% in a population-based survey conducted in Victoria and South Australia with a larger population of 4366 postpartum women at 6 months postpartum (Yelland, Sutherland, & Brown, 2010). Postpartum anxiety appears to be at least as common in developing countries as it is in developed countries (Adewuya & Afolabi, 2005; Shrestha, Adachi, Petrini, & Shrestha, 2014; Tavares et al., 2012). In Nigeria the point prevalence rates for postpartum anxiety at weeks 1, 4, 8 were found to be 28.1%, 17.9%, 10.2% respectively (Adewuya & Afolabi, 2005). The prevalence of depression and anxiety symptoms as well as associated factors was found to be 34% and 33% respectively, in a study of postnatal women in South East Nigeria (Agbaje et al., 2019). Yet another study in South Eastern Nigeria on postpartum depression, anxiety and marital satisfaction on 309 nursing mothers found the prevalence rate of postpartum anxiety to be 31.1% and 33.3% for postpartum depression (Odinka JI, Nwoke M, Chukwuorji JBC, 2018). According to a study on the longitudinal course of generalized anxiety symptoms in the antepartum and postpartum periods among women from

Ghana and Cote d'Ivoire, the majority of them to have persistently low anxiety symptoms, 11.4 % had high anxiety scores before and around childbirth that gradually decreased, and 5.4% had increasing anxiety symptoms over time. Only 3.3% of participants in the same study reported transient anxiety with high scores at three and twelve months (Barthel, Kriston, Barkmann, Appiah-Poku, Te Bonle, Yao, Carine, Jean Armel, et al., 2016). A study in Egypt assessing PPD and PPA among females attending primary health care facilities found a prevalence rate of 10% for PPA (Wassif et al., 2019). In East Africa, a study in Tanzania found the prevalence of Common mental disorders (CMD) including anxiety in a group of mothers with young children aged between 0 and 36 months to be 28.8% (Uriyo, Abubakar, Swai, Msuya, & Stray-Pedersen, 2013). This is almost similar to Kenya where a study done in Mombasa found the prevalence of CMD such as anxiety and depression in mothers with young children to be about 20% (Nusrat Husain et al., 2016).

2.2 Clinical Course and Presentation of Postpartum Anxiety

The transition to motherhood has been associated with high levels of stress over time (Goldstein, Diener, & Mangelsdorf, 1996). According to their research (Goldstein et al., 1996), stress levels rose significantly in the first three months after delivery compared to the first six months of pregnancy. An increase in stress is likely to lead to a rise in anxiety, as it has been proven that psychosocial stressors play a significant role in the development of anxiety, particularly in those who are more prone to it (Wenzel, Haugen, Jackson, & Robinson, 2003). Furthermore, learning the new external obligations that come with motherhood may add to the development of anxiety, as the presence of seemingly unmanageable demands has been linked to anxiety (Wenzel et al., 2003). The transition to parenthood appears to be a gradual and complex process that extends beyond the birth of a child and is not a passing phenomenon for women (Woollett & Parr, 1997). Furthermore, anxiety symptoms may manifest differently for first-time mothers and mothers of older children (Wardrop & Popadiuk, 2013). According to Dipietro and colleagues, anxiety decreased in a sample of multiparous women from pregnancy to the first 24 months after delivery, but first time mothers had an opposite experience (Dipietro, Costigan, & Sipsma, 2008).

PPA refers to anxiety experienced in the first twelve months after delivery (Leach et al., 2017). There is no standardized diagnostic criteria for postpartum anxiety, however, in some cases it is

likely that postpartum anxiety is an exacerbation of underlying GAD while in other cases it is situational due to certain peripartum circumstances (Jordan & Minikel, 2019). While the DSM-5 does not specifically diagnose PPA it does provide a helpful approach to diagnosing it by applying the principles for PPD to PPA (Jordan & Minikel, 2019). Using this principle therefore, to diagnose PPA a mother would need to meet the criteria for an anxiety disorder and have its onset within a specific perinatal period (Jordan & Minikel, 2019). Presentations of PPA could include phobias and panic disorder that might interfere with a mother's ability to look after her baby (Jordan & Minikel, 2019).

According to the DSM 5 the criteria for GAD is: excessive worry over a variety of things, uncontrollable worry, worry associated with 3 or more cognitive or physical symptoms of restlessness, impaired concentration, easy fatigability, irritability; inability to carry out daily activities and responsibilities due to worry, anxiety or associated symptoms, symptoms independent to other medical conditions and not explained by the effects of drugs such as prescription medications, alcohol or recreational drugs; symptoms unrelated to another mental disorder (APA, 2013). GAD appears to be more common in postpartum women than in the general population, with rates ranging from 4.4% in a community sample of 68 women to 8.2% in 147 women at 6-8 weeks postpartum (Wenzel, Haugen, Jackson, & Brendle, 2005; Wenzel et al., 2003). A sample of 28 Australian mothers who had given birth in the previous 5 years and self-reported as having experienced postpartum anxiety described themselves as restless, overwhelmed, unable to make decisions, fatigued, angry, having trouble sleeping and having excessive worries about the baby's wellbeing, as well as feeling disconnected and agoraphobia (Highet, Stevenson, Purtell, & Coe, 2014).

Panic disorder is a disorder characterized by frequent panic attacks, both recurrent and chronic worries about potential attacks, worries about the effects of panic attacks and or major behavioral changes due to the existence of panic attacks (APA, 2013). A study of 64 childbearing women found that a substantially higher number of women had a postpartum onset panic disorder during their first twelve weeks postpartum, a result that was significantly higher than predicted by chance (Jacob & Storch, 2013). Another study on 40 women with preexisting panic disorder, 35% had a worsening of their symptoms during the puerperal period (Jacob & Storch,

2013)while In another study in a sample of women with preexisting panic disorder, 63% had symptoms intensifying during the postpartum period (Jacob & Storch, 2013).

Social Phobia is characterized by excessive fear of humiliation or negative appraisal that is associated with significant discomfort, interference with functioning and avoidance of social situations (APA, 2013). Approximately 4% of community women in their postpartum period reported onset of social phobia during postpartum according to a longitudinal study finding (Wenzel et al., 2005). 2.3% met diagnostic criteria at six months postpartum. The decline in prevalence rates over time however, indicates that the disorder may be temporary during the postpartum period (Jacob & Storch, 2013). Main complaints raised by mothers included worries about body image, difficulties interacting with others, and avoiding social situations (Jacob & Storch, 2013).

2.3 Factors Associated with Postpartum Anxiety

2.31 Socio-Demographic Factors

In a study in Qatar of 1659 mothers, 13% reported postpartum anxiety. Young mothers and women with a higher educated women were more anxious at 35% and 68% respectively, and postpartum working women were more anxious, while housewives were more depressed (Bener, Gerber, & Sheikh, 2012). Both primi-parity and multi-parity were found to be significant in postpartum anxiety (C. L. Dennis et al., 2013; Paul, Downs, Schaefer, Beiler, & Weisman, 2013). Younger maternal age, living without a partner or being single, and having a lower level of education were all associated with postpartum anxiety in an Australian study (Yelland et al., 2010). This contrasts with the findings of a Croatian online survey on mental disorders in the postpartum period, which indicated the highest percentage of anxiety in women aged 36 and older (22.22%) (Zivoder, Martic-biocina, Veronek, & Ursulin-trstenjak, 2019).

Unemployment, having an unsupportive partner, verbal and physical abuse, polygamous marriage, having at least three children, HIV/AIDS, and losing a loved one are all identified socio-demographic risk factors for CMD among mothers in LLMICs (Antelman et al., 2007; Fisher, Tran, Kriitmaa, & Tran, 2010; Mirza & Jenkins, 2004; Patel, Abas, Broadhead, Todd, & Reeler, 2001; Sawyer et al., 2010; WHO, 2008). In Africa, a study in Nigeria found maternal age below the age of 44 years , a primary education and having a high (above Naira 20,000) monthly

income to be associated with postnatal anxiety (Agbaje et al., 2019). In East Africa, a study in Tanzania on correlates of common mental disorders such as anxiety among mothers of children between 0 and 36 months found associated socio-demographic factors to include being separated/widowed/divorced at 44%, single 27.4% being married 30% while cohabiting had the least risk associated with common mental illnesses at 19%. In the same study those in a polygamous relationship had a higher risk of CMD compared to those in non-polygamous relationships. Older mothers were more associated with CMI compared to younger mothers at 40% and 17.9% respectively. Lower education was also associated with common mental disorders at 30.5%. Drinking alcohol was linked to a higher risk of common mental disorders at 34.3% as well as a positive HIV status at 42.5%. The unskilled manual workers had a higher risk associated with CMI compared to those mothers with professional/technical skills (Uriyo et al., 2013).

2.32 Family Support and Relational Factors

A multidimensional concept, social support includes support through information and advice, practical assistance and emotional support (Biaggi, Conroy, & Pawlby, 2015). Lacking intimate relationship empathy and support, having hostile in-laws, intimate partner violence and insufficient emotional and practical support were all identified as risk factors for CPMDs in a systematic study of CPDMs in low and lower middle income countries (Fisher et al., 2012). In a six week and 4-6 month postpartum study in Mexico City, a lack of social support was linked to anxiety at six weeks, and a lack of social support and lack of spouse was linked to postpartum anxiety at 4 to 6 months (Navarrete, Lara-cantú, Navarro, Gómez, & Morales, 2012). A review of several studies published between 2006 and 2014 found a lack of family support, poor partner relationships and domestic and physical abuse to be associated with elevated perinatal anxiety (Leach et al., 2017). Lack of family support and marital and family conflict was linked to postpartum anxiety in a systematic review of several studies on postpartum women in Africa (Sawyer et al., 2010). In Kilimanjaro region, Tanzania, a study on common mental disorders (CMD) among women with young children, lack of partner assistance in caring for children was associated with a risk of developing common mental disorders (Uriyo et al., 2013). Moreover in the same study, being in verbally and physically abusive relationships was also associated with an increased risk of developing CMD. A study in Kenya by (Harpham, 1994; N Husain et al., 2006) found an association between the risk of developing depression in mothers and a lack of

emotional, social and practical support which was attributed to the transition away from the traditional way of life.

2.33 Psychiatric and Psychosocial Factors

A previous psychiatric history of prenatal anxiety has been demonstrated to be an independent predictor of postpartum anxiety according to several studies (Field, 2017). Untreated prenatal anxiety symptoms were predictive of anxiety and depression symptoms in the postpartum period, according to a study conducted in a sample of Mexican mothers during pregnancy, at 6 weeks postpartum and at 4 – 6 months postpartum (Navarrete et al., 2012). A Norwegian study found pre-partum anxiety and depression was related to early cessation of breastfeeding which predicted an increase in postpartum anxiety and depression (E., 2012). Postpartum anxiety was of greatest risk in multiparous women with high stress symptoms and a psychiatric history (Field, 2017). In a study of anxiety symptoms and coping techniques in French women throughout the perinatal period, 20% of the women experienced significant postpartum anxiety symptoms and had more inappropriate coping and less adaptive coping responses, which may have led to the postpartum anxiety's persistence (George, Luz, De Tychev, Thilly, & Spitz, 2013a). High postpartum anxiety has also been linked to an early family history of neglect and abuse, history of trauma, past miscarriage, poor birthing experiences, personality style and child temperament during the postpartum period (Agrati et al., 2015; Goodman, Watson, & Stubbs, 2016). A past history of anxiety in a study of 500 postpartum women in Egypt was a significant predictor of postpartum anxiety (Wassif et al., 2019).

2.34 Childbirth Experiences

The mode of delivery as well as the fears around the birth process have been associated with risk of postpartum anxiety (Field, 2017). Approximately 14% of women develop elevated levels of fear of childbirth also called tokophobia (Hofberg & Brockington, 2000). Primary tokophobia develops before delivery or pregnancy whereas secondary tokophobia develops after a mother undergoes what they perceive to be a negative birth experience (Hofberg & Brockington, 2000). Women with tokophobia have more psychologically vulnerable profiles and have a higher likelihood of experiencing symptoms of depression and anxiety postpartum (Poggi, Goutaudier, Séjourné, & Chabrol, 2018). Moreover these women are more likely to request to undergo cesarean section and to perceive their birth experience negatively and later develop PTSD

(Çapik, 2018; Dikmen-yildiz, Ayers, & Phillips, 2017; Donovan & Mbbs, 2017). Compared to natural delivery, caesarean section was associated with elevated anxiety in one study while in another study it was associated with postpartum anxiety, depression and stress (Clout & Brown, 2015). According to (Poggi et al., 2018) a mothers fear of childbirth and satisfaction with the attitudes of the medical staff during delivery together with her perception of her childbirth experience were predictors of postpartum PTSD.

2.35 Protective Factors

Protective factors are factors that enhance or change how an individual reacts to any environmental threat predisposing to a maladaptive result (Rutter, 2001). In general, protective factors associated with anxiety disorders in adults have included factors such as social support, religious coping, adaptive coping strategies, healthy eating and sleeping habits and engaging in positive activities such as physical exercises (Zimmermann, Chong, Vechiu, & Papa, 2020). A study on protective factors associated with development of fewer GAD symptoms among women affected by Intimate Partner Violence found that spiritual support and community support but not social support to be protective (Schaefer, Howell, Thurston, Kaufman, & Hasselle, 2018). Spirituality was observed to be a source of significant inner power, comfort and direct perceived support from the spiritual relationship (Gillum et al., 2006; Peterson, Johnson, & Tenzek, 2010; Watlington & Murphy, 2010). Individuals who receive community support gain a sense of belonging and identity as well as opportunities for relationships and social interaction, as well as a reduction in distress and an increase in wellbeing (Lin, Ye, & Ensel, 1999). A systematic review of studies of perinatal mental disorders in women in low and lower middle income countries found that being more educated, being permanently employed, coming from an ethnic majority, having access to sexual and reproductive health services such as family planning, and having supportive family relations were all protective factors of CPMDs among postpartum women (Fisher et al., 2012). Repeatedly, women with social support, specifically partner support were found protected from development of postpartum anxiety (Buist, Gotman, & Yonkers, 2011; Engle, Scrimshaw, Zambrana, & Dunkel-Schetter, 1990; Martini et al., 2015; Norbeck & Anderson, 1989). Higher progesterone levels were also found to be protective from developing postpartum anxiety/depression according to a study done in Egypt (Wassif et al., 2019). A study on West African women from Ghana and Cote d'Ivoire found partner support protective from elevated anxiety (Barthel, Kriston, Barkmann, Appiah-Poku, Te Bonle, Yao, Carine, Jean Armel,

et al., 2016). In Nigeria a study on postpartum women found having a rural residence protective against developing comorbid depressive and anxiety symptoms (Agbaje et al., 2019) Meanwhile in a Tanzanian study, Cohabiting was found to be protective against developing common mental disorders among mothers with young children (Uriyo et al., 2013).

Table 1: Common Risk and protective factors associated with postpartum anxiety.

Risk Factors	Reference
Socio-demographic factors	
Young maternal age	(Bener et al., 2012; Yelland et al., 2010)
Higher education	(Bener et al., 2012)
Working mother	(Bener et al., 2012)
Single status	(Yelland et al., 2010)
Lower level of education	(Yelland et al., 2010)
Older maternal age	(Zivoder et al., 2019)
High monthly income	(Agbaje et al., 2019)
Support and Relational factors	
Lack of social support	(Leach et al., 2017; Navarrete et al., 2012; Sawyer et al., 2010)
Poor partner relationships	(Leach et al., 2017)
Lack of spousal support	(Navarrete et al., 2012)
Physical abuse	(Leach et al., 2017)
Psychiatric and psychosocial factors	
Untreated prenatal anxiety symptoms	(E., 2012; Field, 2017; Navarrete et al., 2012)
Inappropriate coping responses	(George, Luz, De Tyche, Thilly, & Spitz, 2013b)
Early family history of neglect, abuse	(Agrati et al., 2015; Goodman et al., 2016)
History of trauma	(Goodman et al., 2016)
Past history of anxiety	(Wassif et al., 2019)
Childbirth experiences	
Negative child birth experiences	(Goodman et al., 2016)
Delivery through Cesarean section	(Çapik, 2018; Clout & Brown, 2015; Dikmen-yildiz et al., 2017; Donovan & Mbbs, 2017)
Mothers fear of birth	(Poggi et al., 2018)
Protective Factors	
Spiritual support	(Gillum et al., 2006; Peterson et al., 2010; Schaefer et al., 2018; Watlington & Murphy, 2010)
Community support	(Lin et al., 1999; Schaefer et al., 2018)
Partner support	(Barthel, Kriston, Barkmann, Appiah-Poku, Te Bonle, Yao, Carine, Ekissi, et al., 2016; Buist et al., 2011)
Higher progesterone levels	(Wassif et al., 2019)
Rural residence	(Agbaje et al., 2019)

2.4: Justification

Prevalence studies in Africa suggest that postpartum depression is more commonly assessed at a prevalence rate of 18% compared to a prevalence of 14% for postpartum anxiety from a fewer number of studies done according to a systematic review of the literature (Sawyer et al., 2010). While anxiety in the postpartum period has not been the primary focus of most studies with more focus being on Postpartum Depression, postpartum women are more likely to be anxious than depressed (Wenzel et al., 2005, 2003). These anxiety symptoms can be severe, with 20% of postpartum women requiring interventions (Leach et al., 2017). Moreover, anxiety and depression may co-exist with anxiety symptoms being labeled as depression even though anxiety can exist in the absence of depression (Miller, Pallant, & Negri, 2006). Furthermore, due to the focus on depression occurrences of anxiety may go unnoticed and hence go untreated (Miller et al., 2006). The burden of postpartum anxiety on the mother and offspring and the paucity of data on postpartum anxiety in our setting makes these research questions of substantial public health importance.

2.5 Research Questions

1. What is the prevalence of postpartum anxiety among mothers attending the Pediatric Demonstration Unit at the Kenyatta National Hospital?
2. What are the protective and risk factors associated with postpartum anxiety among mothers attending Pediatric Demonstration Unit at the Kenyatta National Hospital?

2.6 Objectives

2.61 Broad Objectives

To determine the prevalence and factors associated with postpartum anxiety in mothers attending the Pediatric Demonstration Unit at the Kenyatta National Hospital, Nairobi, Kenya.

2.62 Specific Objectives

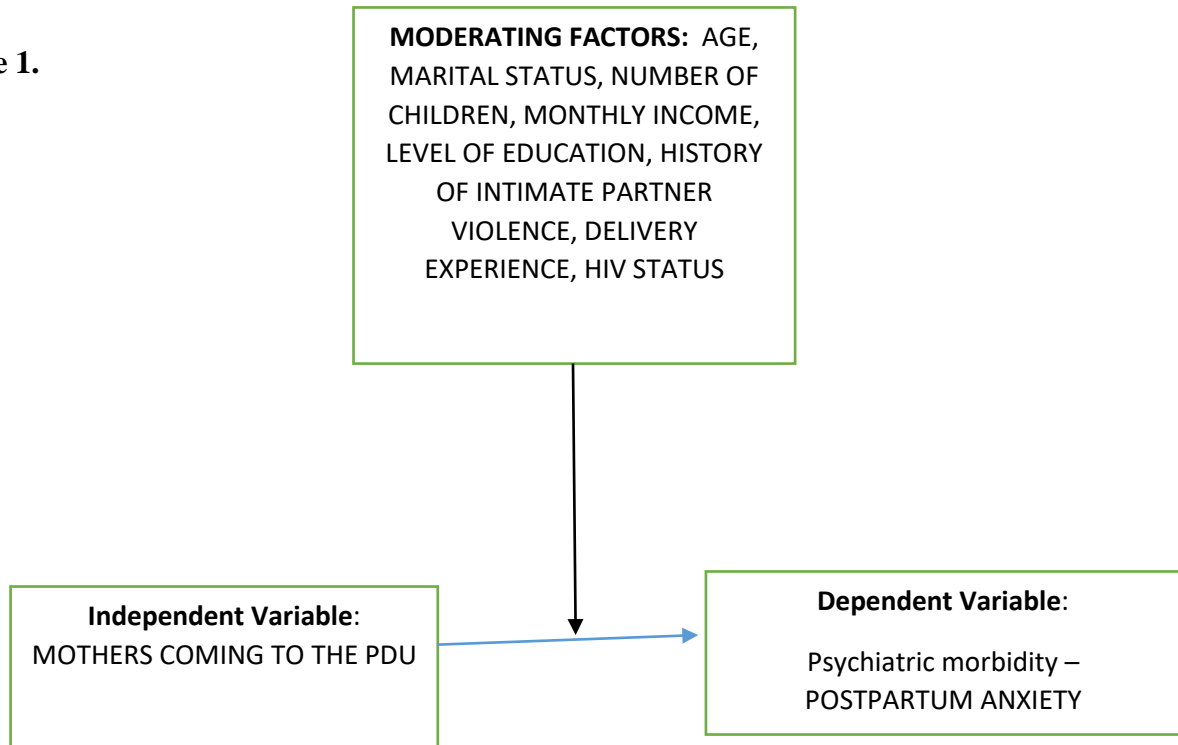
- 1) To determine the prevalence of postpartum anxiety in mothers attending the Pediatric Demonstration Unit at Kenyatta National Hospital
- 2) To identify key risk factors associated with Postpartum Anxiety in mothers attending Pediatric Demonstration Unit at Kenyatta National Hospital

- 3) To determine key protective factors associated with Postpartum Anxiety in mothers attending Pediatric Demonstration Unit at Kenyatta National Hospital

2.7 Conceptual Framework

The conceptual framework illustrates the relationship between the Independent variable, mothers coming to the PDU and the moderating variables which are maternal age, marital status, level of education, employment status, and maternal HIV status, number of children, monthly income, and history of IPV. The outcome, the dependent variable postpartum anxiety is influenced by the interplay of the moderating variables on the independent variable.

Figure 1.



CHAPTER 3

3.0 METHODOLOGY

3.1 Study Design

This was a Cross sectional study. Data was collected from a study population comprising of postpartum women. Different people in the population might have been exposed to different risk factors for developing PPA. These include being single, previous history of diagnosed mental illness, history of intimate partner violence. The population might also have been exposed to environment protective of postpartum anxiety such as being married and having positive partner support. Analysis involved comparing the outcome of interest, PPA, in those exposed to the risk factors versus those not exposed as well as the protective factors in those found not to have PPA. Evaluation for Anxiety was through a self-administered screen for anxiety, the Hospital Anxiety and Depression Scale (HADS). A clinical cutoff score of 8+ was used to determine mothers at risk of an anxiety disorder. Since this screening tool assesses both Anxiety and Depression, we used the entire tool (both the Anxiety and Depression subscales) and during data analysis we controlled for depression. For easy understanding of the HADS, it was in both English and Swahili.

3.2 Study Area

This study was carried out at the Pediatric Demonstration Unit (PDU) at the Kenyatta National Hospital (KNH). The hospital provides very varied socio-demographic and reproductive characteristics for patients from all over the country. This hospital is located 4kilometers from the city center on Ngong' Road along Hospital Road, in Nairobi, Kenya's capital. It covers an area of 45.7 hectares. It is the republic of Kenya's largest referral hospital, with a bed capacity of 1400. It is the teaching hospital for the College of Health Sciences of the University of Nairobi (UON) and the Kenya Medical Training College of Kenya. The PDU is the study area for this research. It is part of the department of Pediatrics and Child Health and is one of the several outpatient services available at the KNH. Other outpatient clinics/units in department of Pediatrics and Child Health are the Pediatric Outpatient Clinic which has various specialized clinics that run on different days throughout the week, as well as the Pediatric Emergency Unit that handles pediatric emergencies.

The PDU runs every weekday, except public holidays, and sees children accompanied by their mothers from six weeks postpartum up to 60 months. Services offered in this unit include child immunization and nutrition as well as demonstrations to mothers on proper breastfeeding technique and child nutrition. It currently sees about 15 mothers with their children a day, approximately 300 mothers a month. Respondents were sampled from the PDU which is an outpatient clinic.

3.3 Study Population

The respondents comprised of all postpartum mothers who came bringing their children to the PDU from six weeks after delivery to one year postpartum. Selection into the study was done as indicated below. Currently approximately 15 mothers with their children are seen on a daily basis.

3.4 Inclusion Criteria

1. Mothers above 18 years old, who are between six weeks and one year postpartum attending the PDU at Kenyatta National Hospital and who give consent.
2. Mothers below 18 years old who are between six weeks and one year postpartum attending PDU at Kenyatta National Hospital who give assent, and are accompanied by a guardian/parent who can give consent.

3.5 Exclusion Criteria

Mothers above one year postpartum. Mothers with debilitating mental illness unable to understand or cooperate.

3.6 Sample Size Determination

A minimum sample size of 125 respondents will be required based on Cochran's (1977) sampling formula. The calculation is as shown below.

$$n = \frac{Z^2 \{1-p\}}{D^2}$$

$$D^2$$

n = sample size

Z = standard error from the mean corresponding to 95% confidence level = 1.96

P = 10 % taken to be estimated prevalence of postpartum anxiety, according to a study done in Egypt (Wassif et al., 2019)

D = Precision/ reliability with which to determine p = 5%

$$n = \frac{1.96 \times 1.96 \times 0.1 (1-0.1)}{0.05 \times 0.05}$$

$$= \frac{3.841 \times 0.1 \times 0.9}{0.0025}$$

0.0025

n = 139 subjects

Corrected sample size for finite population

$$n' = \frac{n}{1 + \frac{n-1}{N}}$$

N

Where, n' = adjusted sample size

n = sample size

N = population size

The population size attending PDU at KNH is approximately 300 mother a month translating to 1200 mothers over 4 months data collection period.

Therefore to get n'

$$n' = \frac{139}{1 + \frac{139-1}{1200}}$$

1200

$$n' = 125$$

3.7 Sampling Procedure

Systematic sampling technique was used. The PDU at KNH was the study site. Participants were recruited at the PDU in Kenyatta National Hospital using systematic sampling method with replacement. Every third mother who met the inclusion criteria and gave assent and or consent was recruited into the study until we got the target sample size. To achieve this we used the PDU patient register as the mother and child came in to the clinic. Those mothers who declined to participate were thanked and excluded from the study and the next mother requested.

3.8 Screening and Recruitment and Consenting Procedure

Study participants were recruited at the PDU at the Kenyatta National Hospital as they came in to the clinic for review. Using systematic sampling, every third mother at the PDU was approached by the researcher. The researcher went over the study's details with each of them and answered any resultant questions or clarifications that arose. Researcher then sought consent and assent from the mothers. Consent was sought from mothers above 18 years of age. There were no mothers below the age of 18 during this study period. Those who accepted to take part in the study were given an opportunity to complete an informed consent form. Those who declined to give consent were thanked and excluded from the study and replaced with the next mother on the list. On obtaining written consent, a structured questionnaire and HADS was administered. Participants were thanked for participating in the study.

3.9 Study Variables

3.91 Primary Outcome Variable

The dependent variable was Postpartum Anxiety

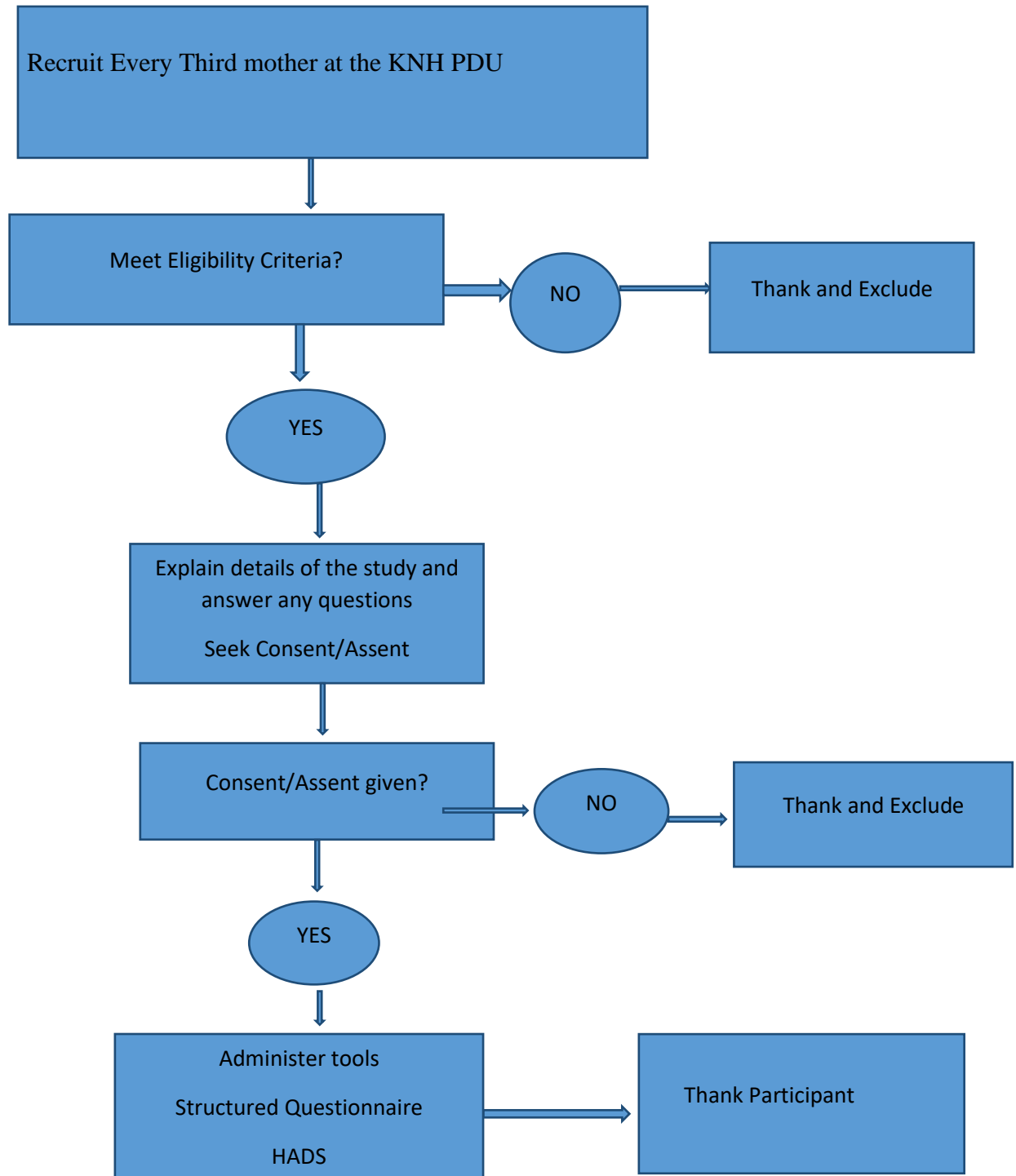
3.92 Independent / Confounding/ Moderating Variables

Psychosocial support was the independent variable. The moderating variables were the participants' marital status, age, level of education, employment status, number of children, history of IPV, residence, type of delivery and delivery experience, HIV status. The Confounding factors were comorbid Depression and any history of diagnosed mental illness.

3.10 Data Collection Procedure

The principal investigator (PI) collected the data. Mothers attending the PDU were identified at the beginning of each day during the data collection period. This was through the outpatient book at the PDU where they register upon arrival for review. The researcher checked to see their eligibility before proceeding to approach every third mother to detail the purpose of the study and if the mother gave consent, administered the written consent form and the structured questionnaire as well as the HADS. If the mother declined to participate in the study, they were thanked and the next mother on the list approached. The researcher ensured each data collection tool was complete before taking it from the participants.

3.11 Recruitment and Data collection Flow-Chart
Figure 2



3.12 Screening and Data Collection Instruments

A Structured Questionnaire (Appendix 7), and the Hospital Anxiety and Depression Scale (Appendix 9) were used to collect data. The principal Investigator distributed questionnaires to the study population, which were and were filled out during the interview.

The questionnaire were composed of two sections:

3.13 Section A: Structured Questionnaire

The researcher created this to obtain demographic data on the mothers, such as their age, marital status, level of education, religion and employment status. Other details included a history of diagnosed mental illness, a history of intimate partner abuse, the presence or lack of partner assistance and the nature of the support, the number of children and delivery history including mode of delivery. The interviewer administered the questionnaire, which took the participants 5 minutes to complete and was available in English and Kiswahili.

3.14 Section B: Hospital Anxiety and Depression Scale (HADS)

The Hospital Anxiety and Depression Scale is a 14 item questionnaire created Zigmond and Snaith in 1983 to identify possible and probable anxiety and depression in patients in non-psychiatric hospitals (Zigmond & Snaith, 1983). In psychiatric, somatic and primary care settings, as well as in the general population, conducted reviews show that it performs well in assessing symptom intensity and caseness of both anxiety and depressive disorders (Bjelland, Dahl, Haug, & Neckelmann, 2002; Herrmann, 1997). A study done on the validity of the HADS in general hospital units and in a community sample was conducted in Nigeria and found it valid for use as a screening instrument in non-psychiatric units as well as valid for use in community settings of developing counties as a screen for mental morbidity (Abiodun AO, 1994). Similar to the Becks Anxiety Inventory (BAI), the Becks Depression Inventory-II (BDI-2) and the Hamilton Depression Scale (HAM-D), it shows adequate internal consistency with reliability above 0.70 among undiagnosed persons, psychiatric and medical patients (Boxley et al., 2016). It has also been demonstrated to be a valid tool for assessing the severity of various mood disorders, and repeated administration at subsequent visits provides crucial information on patient progress to the health care provider (Zigmond & Snaith, 1983). It is divided into two subscales for anxiety (HADS-A) and Depression (HADS-D) (Lisspers, Nygren, & Soderman, 1997). Each subscale has seven items on a four-point Likert scale ranging from 0-3, and is scored

by summing up the ratings for all 14 items to produce a total score, as well as adding up the ratings for each subscale's seven items to get separate depression and anxiety scores (Lisspers et al., 1997).

The HADS (Anxiety subscale) assesses generalized anxiety including worry, tension, panic, fear, restlessness and difficulty relaxing (Julian, 2011). It is a self-administered questionnaire that the interviewer can also administer. The total score for each subscale can range from 0-21, with 0-7 indicating minimal anxiety, 8-10 mild anxiety, 11-14 moderate anxiety and 12-21 indicating severe anxiety. An optimal cut off score of 8+ is recommended for use to indicate possible psychiatric morbidity according to DSM III criteria. Correlations between the two subscales range from .40 to .74 while Cronbach's alpha for HADS-A ranges from .68 to .93, additionally sensitivity and specificity are achieved when caseness is defined by a score of 8+ on both the HADS-A and HADS-D and ranges between .70 to .90 which is comparable to the sensitivity and specificity achieved by the General Health Questionnaire (GHQ) (Bjelland et al., 2002). The HADS takes less than 5 minutes to complete. We will use the entire HADS to screen for anxiety and depression despite the fact that the focus of this study is PPA. We will control for depression during data analysis.

Table 2: Sensitivity and Specificity of self-report screening tools for various anxiety disorders in general and perinatal populations (Simpson, Glazer, Michalski, Steiner, & Frey, 2014).

Screening Tool	Disorder	General Population Sensitivity %	General population Specificity %	Cut off	Perinatal Population Sensitivity %	Perinatal Population Specificity %	Cutoff
EPDS (Grigoriadis et al., 2011)	GAD	-	-	-	70	82	>12
EPDS-3A (Grigoriadis et al., 2011)	GAD	-	-	-	88	49	>4
HADS (Abiodun AO, 1994; Meades & Ayers, 2011)	Anxiety	87.5	90.6	8	92.9	90.2	8
STAI (Meades & Ayers, 2011)	Anxiety	-	-	-	80.95	79.75	>40
K-10 (Donker et al., 2010; Meades & Ayers, 2011)	Any Anxiety Disorder	79	76	20	-	-	-
	GAD	94	67	20	-	-	-

	Panic Disorder	81	70	20	50	98	-
	Social Phobia	78	68	20	100	98	-
	PTSD	-	-	-	50	80	-
GHQ-28* (Goldberg et al., 1997; Meades & Ayers, 2011)	Anxiety, normal GHQ scoring	79.7	79.2	-	75	83	3
	Anxiety C-GHQ scoring	-	-	-	82	85	7

*For the GHQ-28 scale two scoring methods were analyzed that included normal GHQ scoring (each item rated on a bimodal scale 0-0 to 1-1) and C-GHQ scoring (for positive items rating of 0-0 to 1-1 was used and 0-1 to 1-1 was the rating used for negative items).

- = Nonreported

EPDS – Edinburgh Postnatal Depression

EPDS-3A – Edinburgh Postnatal Depression Scale – Anxiety Subscale

HADS – Hospital Anxiety and Depression Scale

K-10 – Kessler – 10

GAD – Generalized Anxiety Disorder

GHQ – General Health Questionnaire

C – GHQ – Chronicity and the GHQ

PTSD – Posttraumatic Stress Disorder

3.15 Materials

1. Structured Questionnaire
2. Hospital Anxiety and Depression Scale (HADS)
3. Pencils 100HB/erasers and sharpeners
4. Safe (Lock and key cabinet)
5. Consent explanation and informed consent forms
6. Study Criteria List

3.16 Pre-testing of the study instrument

Prior to the study, a pilot study was conducted at the Kenyatta National Hospital PDU to ensure the study tool's validity and reliability. A total of 20 patients were included in the study. The purpose of the pre-test was to assess the main study's accuracy, feasibility and clarity in terms of costs and other logistics.

3.17 Quality assurance procedures

The researcher ensured that the participants understood the questions thoroughly and what the study was about. Once filled, interview guides were reviewed for completeness and accuracy of information by the researcher. The interview guides were labeled with codes/serial numbers to protect confidentiality and privacy. To ensure that data was collected uniformly, a standard operating procedure for data collection was developed. To ensure that data was entered, managed, and analyzed correctly, a qualified statistician was brought in. All data collection equipment was kept secure, and the computer used to enter and analyze data was password protected. Only the principal PI, statistician and supervisors had access to the data collection tools. The statistician signed a confidentiality agreement to ensure protection of participants' identity and information since they handled identifiable data.

3.18 Ethical Consideration

Kenyatta National Hospital administration and the University Of Nairobi Ethics and Research Committee provided ethical approval and clearance to conduct the study. Eligible participants were taken through the consent explanation which explained the study process, its objectives and

purpose. This was done by the researcher after which a signed informed consent was required for participation in the study. Only those participants who wished to take part in the study signed informed consent voluntarily and without coercion. Participants were told information gathered would only be used for study purposes. Anyone who opted out at any time or withdrew or even declined to answer any question for any reason was not threatened or penalized. All information obtained in this study was confidential. There were no identifiers on the questionnaires or interview guides; instead of names, serial numbers were used. Hard copies were kept under lock and key and soft copies were stored in password protected systems.

3.19 Data Management and Analysis

Data from the data collection sheet was double checked on a daily basis to ensure it was accurate and complete. The data was cleansed and computerized by the researcher in preparation for analysis by the statistician. The soft data was retrieved from the data collection sheet and was coded for faster error identification using the SPSS version 22.0 and after saved in a password protected Microsoft Access Database that was only accessible by the researcher and statistician. After data collection the hard data was stored in a secure cabinet daily. Before data was entered into the computerized software it was first cleaned, sorted and coded. Univariate analysis was done to describe the prevalence and socio-demographic characteristics of the participants. The mothers' socio-demographic profiles were shown in univariate analysis using the mean age and frequency tables. To portray the nature of postpartum anxiety and test the significance of the association between the independent, moderating variables, confounding variable and dependent variable, bivariate analysis employed Chi-square, graphs and logistic regression. Multivariate analysis assessed the social correlates of postpartum anxiety. Through logistic regression we controlled for depression. Associations between postpartum anxiety and socio-demographic characteristics were expressed using an odds ratio (OR) with a 95% confidence interval and a P value significance of 0.05.

On concluding the study, we will store data collected for at least five years during which time we will intend to publish the study. The study documents' physical copies will be kept in a secure cabinet while the soft copies will be kept on a hard drive. Only the supervisors and the principal investigator will have access to the soft copies and hard copies and will collectively be responsible for it. At the end of the five year period, data will be disposed of by deleting the soft

copy and mechanical destruction of the hard drive, and the hard copy documents will be shredded.

CHAPTER 4: RESULTS

This study included 131 postpartum women recruited into the study from January 2021 to March 2021. Their ages ranged from 18 to 41 with a mean value 30.7years +/- 5.6 and 95.4% came from urban regions and 51.8% completing tertiary education. The duration postpartum ranged between 6 and 52 weeks, 90.1% were married/with a partner, 90% belonged to the Christian faith while 39.7% were unemployed and 63.8% earned an income less than ksh 20,000 a month. The age of the babies ranged between 6 and 52 weeks, in which 53.4% were delivered by SVD with 34.4% of the women having a traumatic delivery experience; more than half of the babies were females (59.2%). Over half of the women (69.5%) had other children and 5.3% had a past history of a miscarriage or a death of a child and 70.2% had planned this pregnancy. 12.2% of the studied women were HIV positive and 3.1% had history of IPV and 0.8% had a past history of diagnosed mental illness (Depression). About 93.1% of the women had partner support with 93.4% having emotional, financial, and practical support from their partners. Most of the mothers (52.7%) did not think they could deal with the worries and stresses of being a new mother and 44.3% considered themselves anxious persons. Anxiety and depression scores ranged from 0 to 19 and 0 to 17 respectively with mean values of 7.0+/-3.4 and 6.0+/-3.3 respectively, and the median and interquartile range (IQR) was 6.0(4.0) and 5.0(5.0), respectively. (Table 1).

Table 1: Distribution of mothers according to social and Demographic characteristics

Variable	Category	Frequency (N=131)	Percentage (%)
Residence	Rural	6	4.6
	Urban	125	95.4
Age	Mean; Median, SD Range	30.7; 31.0; 5.6; 18-41	
Age Group	18-25 Years	28	21.4
	26-35 Years	72	55.0
	36 -41 Years	31	23.7
Age of the baby	8 Weeks and Above	105	80.2
	<8 Weeks	26	19.8
Level of Education	Primary education	16	12.2
	Secondary education	47	35.9
	Tertiary education	68	51.9
Marital Status	Single/ without a partner	13	9.9

	Married/ With a partner	118	90.1
Religion	Catholic	32	24.4
	Protestant	38	29.0
	Pentecostal	48	36.6
	Others	13	9.9
Occupation	Unemployed	52	39.7
	Employed	79	60.3
Monthly Income	<20,000 KSh	83	63.8
	>20,000- <50,000 KSh	34	26.0
	>50,000 and Above	14	10.8
Risk factors			
Sex of the Child (N=131)	Female	77	59.2
	Male	53	40.8
Has other children	Yes	91	69.5
	No	40	30.5
Experienced Death of a Child	No	124	94.7
	Yes	7	5.3
Pregnancy planned	Yes	92	70.2
	No	39	29.8
Delivery type	SVD	70	53.4
	Elective CS	22	16.8
	Emergency CS	39	29.8
Delivery experience	Uneventful	86	65.6
	Traumatic	45	34.4
HIV status	Positive	16	12.2
	Negative	115	87.8
History of intimate partner violence	Yes	4	3.1
	No	127	96.9
Previous history of mental illness diagnosis	Yes (Depression)	1	0.8
	No	130	99.2
Protective factors Is your Partner supportive	Yes	122	93.1
	No	9	6.9
Type of partner support			
Financially		4	3.3
Practically (day to day handling of baby)		4	3.3
All the above		114	93.4

Can deal with stress and worries that comes with being a new mother	Yes	62	47.3
	No	69	52.7
Consider yourself an anxious person	Yes	58	44.3
	No	73	55.7

4.1 Reliability of the HADS

The anxiety subscale HADS-A had a reliability of 0.623 whereas the depression subscale HADS-D had a reliability of 0.586. The correlations between depression and anxiety was 0.425. The reliability of the entire 14 items on the HADS was 0.713.

4.2 Prevalence, severity and comorbidity of postpartum anxiety and depression

Participants with a HADS-A/HADS-D score of 8 or more were classified as anxious or depressed while those with a score of less than 8 were considered not anxious or depressed. On the HADS-A, the number of women identified in our sample as anxious was 53 (40.5%) with a mean, median and SD of 7.0, 6.0 and 3.4 respectively. Compounders of anxiety observed in the study were concerns about baby welfare 41.2%, financial worries 33.3%, general everyday worries 33.3%, medical worries 7.8% and marital worries at 5.9%. Similarly from the participants the study found relievers of anxiety to be Inner support 67%, community support 26.5%, spiritual support 21.6%, partner support 9.8%, and financial support 7.8%. On the HADS-D, the prevalence of depression in our sample was 32.1% and 17.6% suffered from comorbid anxiety and depression. Considering severity, 26.0%, 11.5% and 3.0% suffered from mild, moderate, severe postpartum anxiety. (Table 2)

Table 2: Prevalence of Anxiety, Depression and Comorbid Anxiety & Depression

Measure	Category	Frequency (N=131)	Percentage (%)	95% C.I.	
				Lower	Upper
Depression	Normal (0-7)	89	67.9	60.3	76.3
	Mild (8-10)	28	21.4	14.5	29.0
	Moderate (11-14)	12	9.2	4.6	14.5
	Severe (15-21)	2	1.5	0.0	3.8
Anxiety	Normal (0-7)	78	59.5	51.1	67.9
	Mild (8-10)	34	26.0	18.3	33.6

Moderate (11-14)	15	11.5	6.1	16.8
Severe (15-21)	4	3.1	0.8	6.1
▪ Prevalence of Anxiety	53	40.5	32.1	48.9
▪ Prevalence of Depression	42	32.1	23.7	39.7
▪ Prevalence of Comorbid Depression & Anxiety	23	17.6	11.5	23.7

4.3 Factors associated with postpartum anxiety symptoms

Based on the data obtained, factors linked with postpartum anxiety in women were assessed independently. We utilized bivariate analysis to determine the importance of these factors in the development of anxiety in postpartum women. Postpartum anxiety was shown to be substantially associated with study participants who were single and didn't have a partner ($p < 0.001$). Among the risk factors, unplanned pregnancy was closely associated with postpartum anxiety ($p = 0.013$). Self-awareness of the ability to deal with stress and worries that came with being a new mother was found to be significantly associated with developing anxiety ($p < 0.001$) as was considering oneself anxious ($p < 0.001$) and having depression ($p = 0.001$). This study found lack of partner support to be significantly associated with anxiety in our sample population ($p < 0.001$). (Table 3 and 4).

Table 3: Socio-Demographic Factors associated with Anxiety (Continuous)

Variable	Category	N	Mean (SD)	P
Residence [†]	Rural	6	7(1.5)	0.991
	Urban	125	7(3.5)	
Age Group [‡]	18-25 Years	28	7(2.8)	0.227
	26-35 Years	72	7(3.5)	
	>35 Years	31	6(3.8)	
Age of the baby [†]	8 Weeks and Above	105	7(3.5)	0.820
	<8 Weeks	26	6(3.1)	
Level of Education [‡]	Primary education	16	8(3.7)	0.342
	Secondary education	47	6(3.6)	
	Tertiary education	68	7(3.3)	
Marital Status [†]	Single/ without a partner	13	10(4.6)	<0.001
	Married/ With a partner	118	6(3.1)	

Religion‡	Catholic	32	6(2.7)	0.295
	Protestant	38	7(3.6)	
	Pentecostal	48	7(3.9)	
	Others	13	6(2.5)	
Occupation†	Unemployed	52	7(3.8)	0.446
	Employed	79	6(3.2)	
Monthly Income‡	<20,000 KSh	83	6(3.6)	0.468
	>20,000- <50,000 KSh	34	7(3.3)	
	>50,000 and Above	14	6(2.8)	

Note: †- Independent Samples t-test; ‡-One way Analysis of Variance (ANOVA)

Table 4: Risk and Protective factors associated with Anxiety (Continuous)

Variable	Category	N	Mean (SD)	P
Sex of the Child (N=130)†	Female	77	6(3.3)	0.205
	Male	53	7(3.7)	
Has other children†	Yes	91	7(3.5)	0.886
	No	40	7(3.3)	
Experienced Death of a Child†	No	124	6(3.5)	0.212
	Yes	7	8(3.2)	
Pregnancy planned†	Yes	92	6(3.3)	0.013
	No	39	8(3.5)	
Delivery type‡	SVD	70	7(3.5)	0.228
	Elective CS	22	5(2.9)	
	Emergency CS	39	6(3.5)	
Delivery experience†	Uneventful	86	7(3.5)	0.887
	Traumatic	45	7(3.3)	
HIV sero-status†	Positive	16	7(4.6)	0.386
	Negative	115	6(3.3)	
History of intimate partner violence†	Yes	4	6(3.1)	0.776
	No	127	7(3.5)	
Partner support†	Yes	122	6(3.1)	<0.001
	No	9	11(4.8)	

Can deal with stress and worries that comes with being a new mother [†]	Yes	62	8(3.6)	<0.001
	No	69	5(2.9)	
Consider yourself an anxious person [†]	Yes	58	8(3.3)	<0.001
	No	73	5(3.0)	
Depression [†]	Negative	89	6(2.9)	0.001
	Positive	42	8(4.1)	

Note: †- Independent Samples t-test; ‡-One way Analysis of Variance (ANOVA)

4.4 Risk and Protective factors of postpartum anxiety

Multivariate analysis showed that thinking one can deal with the stress and worries of being a new mother, considering oneself an anxious person and having depression are the significant predictors of postpartum anxiety alone $p=0.024$, <0.001 and 0.001 respectively. (Table 5)

Table 5: Independent Predictors of Anxiety (Multivariate analysis)

Parameter	Category	β	S.E.	95% Confidence Interval		Sig.
				Lower	Upper	
				Marital Status	Single	
	Married	Ref.				
Pregnancy planned	Yes	-0.48	0.53	-1.52	0.56	0.365
	No	Ref.				
Partner support	Yes	-1.84	1.64	-5.05	1.37	0.262
	No	Ref.				
Can deal with stress and worries that comes with being a new mother	Yes	1.12	0.50	0.15	2.09	0.024
	No	Ref.				
Consider yourself an anxious person	Yes	2.16	0.50	1.19	3.13	<0.001
	No	Ref.				
Depression scores		0.26	0.08	0.11	0.41	0.001

CHAPTER 5: DISCUSSION

5.1 Introduction

This study focused on women who were between 6 weeks to 1 year postpartum, and was aimed at assessing the prevalence of PPA in mothers attending the KNH pediatric demonstration unit and the risk and protective factors associated with it. Our study represents the first study of prevalence, risk and protective factors of postpartum anxiety in a Kenyan community sample of women.

5.1 Prevalence of postpartum anxiety

The findings of this study demonstrate that postpartum anxiety is a public health concern: 40.5% of the participants in our study presented with postpartum anxiety, which is in keeping with different literature that found the prevalence rates of PPA to range from 13% to 40% (Field, 2017) and higher than that of anxiety in the general population. However, our study findings are slightly higher than those of a Kenyatta National Hospital study comparing mothers with pre-term babies to those with term babies on postpartum anxiety and depression, which indicated that 35.1% of mothers with pre-term babies screened positive for anxiety (Mutua, Kigamwa, Ng'ang'a, Tele, & Kumar, 2020). A study done in Nigeria to assess depression and anxiety in 270 postpartum women that used the HAD-A found a prevalence of 33.3% for anxiety while 31.1% was the prevalence of postpartum anxiety in another cross-sectional study in Nigeria of 309 postpartum mothers that also used the HADS (Agbaje et al., 2019; Odinka JI, Nwoke M, Chukwuorji JBC, 2018). In a Similar study in Egypt the prevalence of PPA using the DASS, was 10% (Wassif et al., 2019). The reasons for these differences could be methodological differences including different study design and screening instruments and the timing at which this study was done which was during a pandemic. Moreover most of our study participants lived in the urban areas and came from a lower social economic status, therefore more vulnerable to suffer common mental disorders including anxiety (Patel, Araya, De Lima, Ludermir, & Todd, 1999). Our findings are lower than those of a study of 129 Birmingham mothers recruited from an obstetric psychiatric clinic which found the prevalence for anxiety of 43% (Brockington, Macdonald, & Wainscott, 2006). However in contrast to our study, their study was conducted on carefully selected participants receiving psychiatric treatment.

A systematic review and meta-analysis involving over 100 studies and more than 221,000 women from 34 countries estimated the prevalence of antenatal and postnatal anxiety and found postnatally 17.8% of women experienced significant anxiety symptoms in their first four weeks postpartum. These rates stabilized to approximately 15% thereafter. The prevalence of any anxiety illness continued to decline postnatally, according to diagnostic interviews, and varied from 9.3% to 9.9% across the first year. Majority of the studies included in that systematic review took place in high income countries. Different environments and study recruiting techniques and inclusion and exclusion criteria, data-collection processes, and follow-up time periods as well as the influence of culture can contribute to the differences in prevalence rates between the included studies from different countries (C. Dennis, Falah-hassani, & Shiri, 2017). Our findings can be explained by another systematic study, that found rates of 'common perinatal mental disorders' substantially higher in low- and middle-income countries than in high-income countries (Fisher et al., 2012). Regarding depression our study found the prevalence of depression and comorbid postpartum anxiety and depression was 32.1% and 17.6% respectively. Similar to this study, other studies have found a higher prevalence of anxiety disorders in the postpartum period compared to depressive disorders. Wenzel et al. (2005) in his study found a rate of 16.4% and 7.5% for anxiety and depressive disorder respectively at 8 weeks postpartum while Matthey et al (2003) in their study of women at 6 weeks postpartum found a higher prevalence of anxiety disorder (16.2%) compared with depressive disorder (10.2%) (Matthey et al., 2003; Wenzel et al., 2005).

Regarding severity of anxiety, a considerable subgroup of women (26.0%) reported mild symptoms of anxiety, 11.5% of the mothers had moderate PPA while those with severe anxiety were 3.1%. These figures are moderately higher than those stated by Wassif et al. (Wassif et al., 2019) who assessed 500 women for postpartum depression and anxiety and found anxiety levels in their sample were 11.8% mild, 8.0% moderate, 7.2% severe and 4.2% extremely severe. This difference between results may be due to different socioeconomic characters of the target populations. Furthermore Wassif et al. made use of the DASS scale.

5.2 Risk and protective factors

This study found that there was more than one risk factor associated with postpartum anxiety. The first key finding of this study was that considering oneself anxious was a related risk factor

for postpartum anxiety ($p < 0.001$). This is similar to a study by Wenzel, Haugen, Jackson and Robinson who documented cases of women with anxiety at eight weeks postpartum who reported a history of chronic worry throughout their lives (Wenzel et al., 2003).

In contrast to our expectations, this study found mothers who thought they could deal with the stresses and worries of being a new mom actually significantly associated with postpartum anxiety ($p = 0.024$). This finding might be explained by a study exploring the prospective relationship between anxiety symptoms and coping strategies during late pregnancy and early postpartum which found denial of reality as an inappropriate coping style associated with anxiety before and after birth (George, Luz, De Tyche, Thilly, & Spitz, 2013c). Further, our finding could be supported by the hypothesis that the presence of cognitive dissonance is positively related to feelings of anxiety. This dissonance is not comfortable psychologically and leads to pressures to decrease or change the dissonance and acts in the same way as tension which is interpreted as anxiety (Suinn, 1965). Compared to general cognitive biases for symptoms of depression and anxiety, maternal perspectives toward motherhood exhibit incremental predictive validity during the pregnancy and postpartum period, further even after adjusting for interpersonal variables, maternal attitudes toward motherhood remain closely linked to anxiety and depression (Sockol, Epperson, & Barber, 2014).

This study identified depression as a statistically significant risk factor ($p = 0.001$). Not only do depression and anxiety diagnoses frequently co-occur, their symptoms are also highly correlated. In a population based survey in the United States of 4451 women, a third of the women who reported anxiety symptoms also reported symptoms of depression (Farr, Dietz, O'Hara, Burley, & Ko, 2014). Smaller studies done among women in the postpartum period have showed comorbidity in anxiety and major depressive episodes in a third of postpartum women while approximately 10-50% of women experience comorbid depression (Austin et al., 2010; Wenzel et al., 2005). Previous studies have reported strongest predictors for peripartum depression and anxiety was anxiety and depression prior to pregnancy (Martini et al., 2015). Our study however, was cross-sectional and was unable to assess the presence of depression prior to the postpartum period.

Interestingly, none of the socio-demographic variables included in this research were associated with risk of postpartum anxiety. Anxiety in the postpartum period was not associated with

maternal educational level or age which is consistent with findings by Fatoye and colleagues (Fatoye, Adeyemi, & Oladimeji, 2004). However qualitatively, several different themes were observed. 41.2% of participants reported worries concerning baby welfare increasing their anxiety. This is a similar finding to a study of 28 Australian mothers at 5 years postpartum who reported experiences of anxiety as including excessive concerns focused on baby's health (Highet et al., 2014). From qualitative studies women have reported general anxiety focused on infant safety and general well-being as well as a perceived inadequacy to be the soci idea of a perfect mother as hindering in their postpartum experiences (Ali, 2018). Regarding financial worries reported by 17 (33.3%) of our participants, financial worries were a theme in a study that found postpartum mothers reporting fears of financial worries (Brockington et al., 2006). General everyday worries was observed in 17 (33.3%) mothers as a compounder of their anxiety which is a similar theme observed in over fifty participants in a longitudinal study of 274 women in Germany identified with postpartum anxiety who reported work and school performance concerns and life in general (Martini et al., 2015). Another theme observed by this study reported by participants to compound postpartum anxiety was marital worries. A systematic review on postpartum women in Africa found marital related conflict linked to postpartum anxiety (Sawyer et al., 2010). Barthel et. al found an association between lower maternal anxiety and lower marital stress in their study of women at two years postpartum (Barthel, Kriston, Barkmann, Appiah-Poku, Te Bonle, Yao, Carine, Ekissi, et al., 2016).

In the multivariate logistic regression no protective factors were significantly associated with postpartum anxiety. However different themes, Inner self-support 67.6%, community support 26.5%, spiritual support 21.6%, partner support 9.8% and financial support 7.8%, were reported by participants as ways that helped manage and relieve anxiety. Inner self-support was observed in 67.6% of the participants and it included activities such as relaxing, sleeping, watching TV and taking time for themselves. Participants reported these activities helped them reduce and manage their anxiety. These findings are in line with Martini et al. who found self-efficacy related to anxiety and depression in the peripartum period (Martini et al., 2015). Similarly Zimmerman and colleagues in their study on risk and protective factors of anxiety in adults, reported positive activities such as physical exercises were protective against developing anxiety in adults (Zimmermann et al., 2020). According to Buist., et al. 2011; Martini et al., 2015 social support but particularly partner support was found protective against developing postpartum

anxiety (Buist et al., 2011; Martini et al., 2015). Similar to our study observation that spiritual and community support relieved feelings of postpartum anxiety, Schaefer et al. also found women with spiritual and community support had fewer symptoms of generalized anxiety disorder (Schaefer et al., 2018).

5.4 Study Limitations

The sample size is relatively small in this study, which limits this study. It may therefore be difficult to generalize the prevalence findings. Moreover due to the timing of the study during a pandemic (Covid19), the prevalence may be over or under exaggerated.

The study relied on self-reported data from the participants which had the potential of affecting the outcomes of the study. Moreover, after screening for anxiety with the HADS tool, we did not proceed to a formal psychiatric evaluation to confirm PPA which could have resulted in false positives being included in the analysis.

5.5 Conclusion

This study found the prevalence of PPA among mothers, between six weeks and one year postpartum attending the PDU, at KNH to be high compared with other regional studies, higher than that of depression and higher than that for women in the general population. Awareness of the ability to deal with stress, considering oneself an anxious person and depression were statistically associated with PPA. Most socio-demographic factors did not appear statistically associated with PPA. The implications of these findings for the management of postnatal disorders in women are considerable because treatment for depression, anxiety and comorbid presentations might differ greatly.

These study findings may support the need for the routine screening of postpartum anxiety in the pediatric demonstration unit.

6.0 Recommendations

6.1 Clinical recommendations

- A) Education of postpartum women, their partners and health care workers regarding anxiety disorders
- B) Anxiety specific screening to be added as part of routine post natal care
- C) Improved access to psychosocial treatments for anxiety

D) The findings be shared with the maternity staff of KNH and other relevant facilities in order to raise awareness about the magnitude of PPA in mothers.

6.2 Research recommendations

- a) Postpartum anxiety, compared to postpartum depression, has been less researched. Increased research to this condition is warranted using different study designs.
- b) A longitudinal study is recommended as the course of anxiety may vary during the course of the postpartum period.
- c) Further studies could adopt a qualitative approach for a more detailed exploration of the risk and protective factors of postpartum anxiety.

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APPENDICES

Appendix 1: Consent explanation Document (English Version)

Title: Risk and Protective factors associated with Postpartum Anxiety among mothers attending the Pediatric Demonstration Unit at the Kenyatta National Hospital.

Participant Study Identification Number

Date

Dear Madam,

Introduction

My name is Dr. Malaika O. Kamenju, a postgraduate student in psychiatry at the University of Nairobi. In collaboration with the University of Nairobi, we are doing a study on the risk and protective factors associated with postpartum anxiety among mothers attending the Pediatric Demonstration Unit at the Kenyatta National Hospital. To achieve this, we need 125 mothers to help us fill questionnaires about themselves which will help us meet our objective.

To this end, we kindly request for you/your next of kin's participation in the study.

Requirements

For one to participate in the study you need to:

1. Be aged 18 years and above
2. Be 18 years and below **with** available next of kin to sign informed consent form

Procedure

If you agree to participate in the study you will

1. Be asked for consent and assent and to sign a consent and assent form expressing voluntary participation.
2. Be asked questions that relate to:
 - i) Socio-demographic information such as age, marital status, occupation, religion, Level of education, residence, number of children and others
 - ii) Information regarding history of diagnosed mental illness, history of Intimate partner violence, presence and nature of partner support and others
 - iii) specific symptoms of anxiety that you may have experienced in the last one week

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

Benefits:

There are no direct benefits for participating in this study.

However, results from this study can help patients and clinicians to better understand the association between socio-demographic characteristics and postpartum anxiety.

This will help in improving the management of mothers with postpartum anxiety.

Risks:

It is possible that you might feel embarrassed or uncomfortable as you give information about your socio-demographic characteristics, which are potentially sensitive topics.

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

Voluntary Participation:

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

Confidentiality:

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

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

Compensation:

You will not be paid to participate in this study.

Additional Information:

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

1. Investigator:
 - a. Dr. Malaika O. Kamenju
Tel: 0705407111
Email: ikaodilia@gmail.com

2. Supervisors:
 - a. Dr. Manase Kumar
Email: m.kumar@ucl.ac.uk
 - b. Dr F. Owiti
Email: f.owiti89@gmail.com

3. Kenyatta National Hospital/ University of Nairobi Ethics & Research committee
P. O Box 19676 – 00202 Nairobi
Tel: (254 – 020) 2726300-9, Ext 44355
Email: uonknh_erc@uonbi.ac.ke

Appendix 2. Consent explanation Document (Swahili Version)

HATI YA RIDHAA

Andiko: Hatari na mambo ya kinga ya wasiwasi kwa wanawake wanaohudhuria kliniki ya lishe na chanjo ya watoto katika hospitali ya taifa ya Kenyatta.

Nambari ya Utambulisho ya mshiriki -----

Tarehe -----

Utangulizi

Mimi Dr. Malaika O. Kamenjuni mwanafunzi wa uzamili katika chuo kikuu cha Nairobi. Ningependa kufanya utafiti huu kuhusu hatari na mambo ya kinga ya wasiwasi kwa wanawake wanaohudhuria kliniki ya lishe na chanjo ya watoto katika hospitali ya taifa ya Kenyatta. Kufikia lengo hili, tunahitaji kina mama takriban 125 kujaza dodoso za utafiti. Ningependa kukuomba ushiriki/ utoe idhini ya jamaa wako kushiriki katika utafiti huu.

Mahitaji ya kushiriki

Ili kushiriki katika utafiti huu unahitajika;

1. Kuwa miaka kumi na nane au Zaidi
2. Kama una miaka chini ya kumi na nane, kuwa na mzazi au mlezi wa kisheria wakutia sahihi fomu ya ridhaa

Utaratibu

Ukikubali kushiriki katika utafiti huu;

1. Utaulizwa maswali ya kibinafsi kuhusu jamii yako na maisha yako ya kila siku
2. Utauliza maswali kuhusu historia ya unyanyasaji wa kinyumbani, uwepo na aina ya msaada kutoka kwa mzazi mwenzako, na historia ya ugonjwa wa akili na kadhalika
3. Utaulizwa maswali kuhusu umevyokuwa ukijiskia kwa wiki moja iliyopita.
Hii itakuwa katika dodoso litalochukua muda wa dakika 20.

Faida

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

Hata hivyo, matokeo ya utafiti huu yatasaidia wagonjwa, jamaa, na madaktari kuelewa vyema mambo ya hatari na kinga ya wasiwasi katika wanawake waliojifungua. Hii itasaidia kuboresha matibabu kwa wanawake waliojifungua.

Hatari Ya Usumbufu

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

Iwapo utapata usumbufu wa kisaikolojia, utapewa usaidizi wa kisaikolojia.

Kushiriki Kwa Hiari

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

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

Usiri

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

Dodoso (Fomu ya maswali ya utafiti) utakayojaza itahifadhiwa kwa usalama, hakuna mtu ataweza kuifikia isipokuwa mimi au wasimamizi wangu. Takwimu zitakazokusanywa katika utafiti huu zitahifadhiwa kwa komputa na kuzuiliwa kwa watu wengine. Komputa zitakazohifadhi takwimu zitalindwa nanamba za kisiri ili kulinda takwimu kutokana na matumizi yasioidhinishwa, kupotea ama marekebisho.

Fidia

Hakuna fidia yoyote kwa kushiriki katika utafiti huu.

Maelezo Zaidi

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

1. Mtafiti:

a. Dr. Malaika O. Kamenju

Tel: 0705 407111

Email: ikaodilia@gmail.com

2. Wasimamizi:

a. Dr. Manase Kumar

Email: m.kumar@ucl.ac.uk

b. Dr F. Owiti

Email: f.owiti89@gmail.com

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

P. O Box 19676 – 00202 Nairobi

Tel: (254 – 020) 2726300-9, Ext 44355

Email: uonknh_erc@uonbi.ac.ke

Appendix 3. Assent and Consent declaration form

Assent clause to be completed by the participant

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

My questions about the study have been answered satisfactorily.

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

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

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

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

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

My questions about the study have been answered satisfactorily.

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

Date -----

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

Relationship to patient -----

To be completed by the researcher

I declare that I have given both a written and verbal explanation of the study. I have explained the purpose of the study, methods, risks and benefits of the study. I have answered and will continue to answer any questions that may arise about the study. The participant will not suffer any adverse consequences in case of early termination of participation in this study.

Name of researcher -----

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

Appendix 4. Swahili Translated consent declaration form

FOMU YA RIDHAA

Tamko la mshiriki.

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

Maswali yangu kuhusu utafiti huu yamejibiwa kwa kuridhisha.

Kwa hiyo mimi ninakubali kwa hiari kushiriki katika utafiti huu wakati nikihifadhi haki yangu ya kusitisha ushiriki wangu wakati wowote.

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

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

Tamko la Jamaa au mlezi wa kisheria

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

Maswali yangu kuhusu utafiti huu yamejibiwa kwa kuridhisha.

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

Tarehe -----

Sahihi ya Jamaa au mlezi wa kisheria -----

Uhusiano na mshiriki -----

Tamko la Mtafiti

Ninatangaza kwamba nimetoa maelezo ya utafiti huu kwamaandishi na pia kwa maneno. Nimeelezeaasili, mbinu, hatari na faida ya utafiti huu.

Nimejibu na nitaendelea kujibu maswali yoyote ambayo yanaweza kutokea kuhusu utafiti huu.

Mshiriki hatapata athari yoyote iwapo atakomesha mapema kushiriki kwa utafiti huu.

Jina la Mtafiti -----

Sahihi ----- Tarehe -----

Appendix 5. Confidentiality Agreement

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

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

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

Name -----

Designation -----

Sign -----

Date -----

Name of Principal Investigator -----

Sign-----

Appendix 6: Questionnaire

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

DEMOGRAPHICS

1. What is the residence type:

1= Rural 2 = Urban

2. What is your age? Years

3. What is the age of the baby? Weeks

4. What is your level of education?

1=No formal education 2=Primary education

3=Secondary education 4=Tertiary education

5. What is your marital status?

1=Single 2= Married

3=Separated/divorced 4= Cohabiting

6. What is your religious affiliation?

1=Catholic 2=protestant

3=Moslem 4=SDA

5=Pentecostal 6=Others

If 6 above, specify:

7. What is your occupation?

1=Not employed

2= Casual laborer 3=Business

4=Professional 5=student

6= others

If other, specify:

8. What is your monthly income?

1= <20,000ksh [] 2= > 20,000ksh - < 50,000ksh []

3 = >50,000 ksh - < 100,000ksh [] 4= > 100,000 ksh []

RISK FACTORS

9. Sex of this Child? Female Male

10. Any other children? Yes No

11. How many? Dead Alive

12. Was this pregnancy planned? Yes No

13. Delivery type for this baby: SVD Elective CS Emergency CS

14. Delivery Experience: Uneventful Traumatic

15. HIV Sero status Positive Negative Not Known

16. History of Intimate Partner Violence Yes No

17. Previous History of diagnosed Mental illness? Yes No

18. If yes, what was the diagnosis?

PROTECTIVE FACTORS

19. Is your partner supportive of you? Yes No

20. If yes, in what way?

Emotionally

Financially

Practically (Day to day handling of the baby)

All the above

21. Do you feel you can deal with stress and worries that come with being a new mother?

Yes No Cannot say

22. Do you consider yourself an anxious person? Yes No

23. If yes, what makes the anxiety worse?

.....
.....
.....
.....
.....

24. What would you say helps you manage/decrease your anxiety?

.....
.....
.....
.....
.....

Appendix 7: Swahili Translated Questionnaire

Tafadhali jibu kila swali kwa usahihi iwezekanavyo kwa kuchagua jibu sahihi au kujaza nafasi iliyotolewa.

MAELEZO YA KIJAMII

1. Aina ya makazi:

1 = Mashinani [] 2 = Mjini []

2. Una miaka mingapi?

3. Mtoto uliyemleta kliniki ana wiki ngapi

4. Umesoma hadi kiwango gani?

1 = sikuenda shule [] 2 = shule ya msingi []

3 = shule ya sekondari [] 4 = chuo []

5. Hali yako ya ndoa ikoje?

1 = sijaolewa [] 2 = nimeolewa []

3 = tumeachana/ talaka [] 3 = hatujaoana ila tunaishi pamoja []

6. Dini yako ni ipi?

1 = Katoliki [] 2 = Protestanti []

3 = Muislamu [] 4 = Msabato []

5 = Mpentekosti [] 6 = Nyingine []

Kama ni nyingine, elezea ni gani

7. Unafanya kazi gani?

1 = sina kazi []

2 = kibarua [] 3 = Mfanya biashara []

4 = Mtaalamu [] 5 = Mwanafunzi

6 = nyingine

Kama ni nyingine, elezea ni ipi

8. Kipato chako ni kipi kwa mwezi?

1 = < 20,000 ksh [] 2 = > 20,000ksh - < 50,000 ksh []

3 = > 50,000 ksh - < 100,000 ksh [] 4 = > 100,000 ksh []

SABABU ZA HATARI

9. Jinsia ya huyu mtoto ni? Wakike Wakiume
10. Una watoto wengine? Ndio Hapana
11. Wangapi? Walio hai Walioaga dunia
12. Mimba ya huyu mtoto ilikua imepangwa?Ndio Hapana
13. Ulijifungua vipi? Kawaida ...Operesheni ya kupanga ...Operesheni ya dharura
14. Hali ya kujifungua ilikuaje? Hakuna shida Ilikua shida
15. Hali yako ya HIV Pozitivu Negativu sijijui
16. Historia ya kupigwa na mume/ mzazi mwenzangu? Ndio Hapana
17. Historia ya kuwa na ugonjwa wa akili? Ndio Apana
18. Kama ni Ndio, Ugonjwa upi wa akili?

SABABU ZA KINGA

19. Unapata msaada kutoka kwa mwenzako/ mzazi mwenzako? Yes No
20. Kama Ndio, msaada ni wa aina gani?
- Kihisia
- Kifedha
- Kivitendo (utunzaji wa mtoto wa kila siku)
- Vyote vilivyotajwa hapa
21. Unahisi unaweza kukabiliana na mafadhaiko na wasiwasi unaokuja na kuwa mama mpya? Ndio Hapana Siwezi kusema
22. Unajiona kuwa mtu mwenye wasiwasi? Ndio Hapana
23. Kama ni ndio, kitu kipi kinaongeza wasiwasi wako?
-
-
-
-
-
-
24. Unaweza kusema ni kitu kipi kinakusaidia kupunguza wasiwasi?
-
-

.....
.....
.....
.....

Appendix 8: Hospital Anxiety Depression Scale (HADS)

Hospital Anxiety and Depression Scale (HADS)

Tick the box beside the reply that is closest to how you have been feeling in the past week.
Don't take too long over your replies: your immediate is best.

D	A		D	A	
		I feel tense or 'wound up':			I feel as if I am slowed down:
3		Most of the time	3		Nearly all the time
2		A lot of the time	2		Very often
1		From time to time, occasionally	1		Sometimes
0		Not at all	0		Not at all
		I still enjoy the things I used to enjoy:			I get a sort of frightened feeling like 'butterflies' in the stomach:
0		Definitely as much	0		Not at all
1		Not quite so much	1		Occasionally
2		Only a little	2		Quite Often
3		Hardly at all	3		Very Often
		I get a sort of frightened feeling as if something awful is about to happen:			I have lost interest in my appearance:
3		Very definitely and quite badly	3		Definitely
2		Yes, but not too badly	2		I don't take as much care as I should
1		A little, but it doesn't worry me	1		I may not take quite as much care
0		Not at all	0		I take just as much care as ever
		I can laugh and see the funny side of things:			I feel restless as I have to be on the move:
0		As much as I always could	3		Very much indeed
1		Not quite so much now	2		Quite a lot
2		Definitely not so much now	1		Not very much
3		Not at all	0		Not at all
		Worrying thoughts go through my mind:			I look forward with enjoyment to things:
3		A great deal of the time	0		As much as I ever did
2		A lot of the time	1		Rather less than I used to
1		From time to time, but not too often	2		Definitely less than I used to
0		Only occasionally	3		Hardly at all
		I feel cheerful:			I get sudden feelings of panic:
3		Not at all	3		Very often indeed
2		Not often	2		Quite often
1		Sometimes	1		Not very often
0		Most of the time	0		Not at all
		I can sit at ease and feel relaxed:			I can enjoy a good book or radio or TV program:
0		Definitely	0		Often
1		Usually	1		Sometimes
2		Not Often	2		Not often
3		Not at all	3		Very seldom

Please check you have answered all the questions

Scoring:

Total score: Depression (D) _____ Anxiety (A) _____

0-7 = Normal

8-10 = Borderline abnormal (borderline case)

11-21 = Abnormal (case)

Appendix 9: Hospital Anxiety and Depression Scale (HADS) Swahili version

SWAHILI HADS-A

Punga kisansuku kando na jibu ambalo ni karibu na jinsi umekuwa ukisikia katika wiki iliyopita. Usichukue muda mrefu juu ya majibu yako, ya haraka ni bora.

Ninahisi mchovu au mzito		
Kila wakati	3	
Wakati mwingi	2	
Mara kwa mara	1	
Hapana kabisa	0	
Ninapata aina ya kuhisi kana kwamba kuna kitu kibaya kinakaribia kutokea		
Hakika na mbaya kabisa	3	
Ndio, lakini sio mbaya sana	2	
Kidogo, lakini hainisumbui	1	
Hapana kabisa	0	
Mawazo ya wasiwasi hupitia akili yangu		
Kwa wakati mwingi sana	3	
Wakati mwingi	2	
Mara kwa mara, lakini sio mara nyingi sana	1	
Hapana kabisa	0	
Naweza kukaa kwa raha na nahisi nimetulia		
Kwa kweli	0	
Kawaida	1	
Si mara nyingi	2	
Hapana kabisa	3	
Napata aina ya hisia za kutisha kama vipepeo kwenye tumbo		
Hapana kabisa	0	
Wakati mwingine	1	
Mara kwa mara	2	
Mara nyingi sana	3	
Ninahisi kutokuwa na utulivu kana kwamba lazima niwe safarini		
Mara nyingi sana	3	
Sana sana	2	
Sio sana	1	
Hapana kabisa	0	
Napata hisia za ghafla za hofu		
Mara nyingi sana kweli	3	

Mara kwa mara	2	
Sio sana	1	
Hapana kabisa	0	

SWAHILI HADS-D

Punga kisanduku kando na jibu ambalo ni karibu na jinsi umekuwa ukisikia katika wiki iliyopita.

Usichukue muda mrefu juu ya majibu yako, ya haraka ni bora.

Bado ninafurahiya vitu ambavyo nilikuwa nikifurahia		
Dhahiri sana	0	
Sio kabisa	1	
Kidogo tu	2	
Hapana kabisa	3	
Ninaweza kucheka na kuona upande wa mambo wa kuchekesha		
Kwa kadiri nilivyoweza siku zote	0	
Sio kabisa sasa	1	
Kwa kweli sio sana sasa	2	
Hapana kabisa	3	
Ninajisikia mwenyefuraha		
Hapana kabisa	3	
Si mara nyingi	2	
Wakati mwingine	1	
Wakati mwingi	0	
Ninahisi kama nimepunguzwa mwendo		
Karibu wakati wote	3	
Mara kwa mara	2	
Wakati mwingine	1	
Hapana kabisa	0	
Nimepoteza hamu na sura yangu		
Kwa kweli	3	
Sijijali sana kama ninavyopaswa	2	
Naeza kosa kujiangalia vizuri	1	
Mimi hujitunza vizuri tu kama zamani	0	
Natarajia vitu kwa furaha na uchangamfu		
Kama vile ninavyofanya kwa kawaida	0	
Chini kuliko kawaida	1	
Dhahiri kidogo kuliko nilivyokuwa	2	
Hapana kabisa	3	

Naweza kufurahia kitabu kizuri, redio au kipindi cha runinga		
Mara nyingi	0	
Mara nyingine	1	
Si mara nyingi	2	
Mara chache sana	3	

