PREVALENCE AND FACTORS ASSOCIATED WITH POSTPARTUM DEPRESSION AMONG MOTHERS IN NEWBORN UNIT AT PUMWANI MATERNITY HOSPITAL

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DECLARATION

I, Dr Peter Okari do hereby declare that this proposal based on actual and original work carried out by me.

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APPROVAL

This proposal has been submitted with our approval as the university supervisors.

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ACRONYMS AND ABBREVIATIONS

BAI Beck Anxiety Inventory

EPDS Edinburgh Postpartum Depression Scale

ERC Ethics Review Committee

KNH Kenyatta National Hospital

NACOSTI National Commission for Science, Technology, and Innovation

PDS Postpartum Depressive Symptom

PPD Postpartum Depression

SPSS Statistical Package for Social Sciences

UoN University of Nairobi

PPA Postpartum anxiety.

DSM Diagnostic Statistic Manual – 5

OPERATING DEFINITIONS

Anxiety - It is the feeling of apprehension or fear about things that are likely to occur.

Postpartum Depression - It is the non-psychotic episodes of depression starting and extending into the periods after birth (M. W. O'Hara, 2009). **Mother -** Someone who gave birth to a neonate or a caring female dedicated to the well-being of their offspring. In this study, the word "mother" refers to someone who gave birth to a preterm neonate and was caring for her preterm neonate in the Newborn Unit.

Mother-infant bond - That attachment that is found between a mother and a neonate from the time of birth.

Newborn Unit - Department within the hospital facility specializing in the care of ill or preterm neonates.

Perception - How something is regarded, understood or interpreted.

Preterm neonate - Neonate born alive before 37 weeks of pregnancy is completed.

Postpartum Depression (PPD) - This is a complex mix of physical, emotional and behavioral changes in a woman a few days or even months after giving birth. Symptoms may include extreme sadness, worthless, depressed mood, lack of interest in enjoyable things, lack of energy, slowing movement, irritability, trouble concentrating and changes in sleeping patterns.

Postpartum Anxiety (PPA) - This mood disorder happens in women a few days after giving birth. The condition manifests with excessive worry, panic attacks, irritability, restlessness, easily fatigued,

tension, increased heart rate, vigilant, apprehension in thoughts and asking others for constant reassurance

ABSTRACT

Study background: Post-Partum Depression (PPD) and Anxiety are now common mental health challenges among postpartum women globally. Internationally, the prevalence of PPD is approximately 13% varying with country, region. There is paucity of studies on this in Kenya. This study will determine the prevalence of PPD and Anxiety.

Objective: To determine the prevalence and risk factors of postpartum Depression and Anxiety among mothers with newborns in the Newborn Unit at Pumwani Maternity Hospital

Study Setting: The study was conducted in Pumwani Maternity newborn – unit.

Methodology: There were 217 Mothers with Neonates in Newborn unit who were recruited to this study via consecutive sampling. A semi-structured questionnaire with biodata and specific factors associated with PPD in other studies was used to obtain data.

Data analysis and results: Data was analyzed using Statistical Package for Social Sciences. For descriptive analysis, frequency, mean, mode, and proportions was used for categorical variables. Binary logistic regression was used to determine association between the covariates and depression status and anxiety, assuming significance at a P value <0.05. The results are presented in tables, graphs and charts.

Results: The prevalence of postpartum depression using EDPS was found to be 17.1%. Marital status, religious affiliation, mode of delivery and not breastfeeding were found to be statistically significantly associated with PPD P =0.02, 0.02, 0.01 & < 0.05 respectively. The prevalence of Postpartum anxiety was 24.4%. The factors that were positively associated with anxiety included: Marital status, Level of education, religious affiliation, Domestic violence with P (0.01, <0.05, <0.05

and 0.03 respectively. The mode of delivery and having complications during pregnancy also had a positive association with Postpartum anxiety (P 0.01 and <0.050 respectively

Conclusion: From the study, 1 in 6 and 1 in 4 mothers in Newborn Unit had PPD and PPA respectively.

Factors that were associated with PPD included: Marital status, mode of delivery and not breastfeeding, while those associated with PPA were: Marital status, Level of education and intimate violence

Recommendations: The study shows a significant number or mothers suffer from PPD and PPA. As shown 1 in 6 and 1 in 6 mothers in NBU, had PPD and Postpartum Anxiety respectively. We recommend routine use of screening tools for the two and intervention be instituted to manage those found with the diagnosis.

CHAPTER ONE: INTRODUCTION

1.1 Background information

Childbirth can be a painful and emotionally charged moment. If prolonged can be pretty exhausting too. During this period, the mother undergoes many changes, including reduction of pregnancy hormones after birth, physical exhaustion and psychological challenges that come with childbirth. The outcome of labor is childbirth. This also can bring different emotions to mothers, ranging from happiness to sadness. If the feeling of sadness lasts more than two weeks, then it is termed Postpartum Depression (PPD) (Payne, J. 2019)

According to DSM-5 (Diagnostic Statistic Manual – 5), PPD is classified as "Major Depressive Disorder, with peripartum onset." The Reason for the peripartum onset is symptoms start to manifest during pregnancy in approximately one-third of the women with PPD. The peripartum symptoms must begin during pregnancy or within four weeks after delivery (Payne, J. 2019).

1.2 DSM – 5 diagnostic criteria of Postpartum depression ((Payne, J. 2019).

The following are the criteria for DSM – 5 diagnoses of PPD:

The patient should have five of the following symptoms or more

- Depressed mood (subjective or observed) is present most of the day
- Loss of interest or pleasure, most of the day
- Insomnia or hypersomnia
- Psychomotor retardation or agitation
- Worthlessness or guilt

- Loss of energy or fatigue
- Suicidal ideation or attempt and recurrent thoughts of death
- Impaired concentration or indecisiveness
- Change in weight or appetite (weight change of 5% over one month)

1.3 Pathophysiology of postpartum Depression:

The pathophysiology of PPD is currently unknown, with genetics, physiological, social and hormonal factors postulated to lead to the development of PPD (Meltzer-Brody S. 2011).

The hormonal theory is one of the significant contributors to postpartum depression. The hypothalamic–pituitary–adrenal (HPA) axis hormones play an essential role in the disease process. It is the axis affected more during stress or trauma. During delivery, a mother experiences both physical and psychological pressure. This can alter the HPA axis. Any derangement of this will lead to a decline in catecholamines, thus predisposing one to the poor stress response.

After delivery, the decline in estradiol and progesterone hormones can alter the response to stress in at-risk women with antecedent onset of depressive symptoms. Also, most mothers, after delivery, will want to breastfeed their children. The mother fails to achieve a good lactation process if there is dysregulated production of prolactin and oxytocin. This has been shown to increase the risk of PPD (Meltzer-Brody S. 2011). Estradiol levels increase in women during the third trimester, dropping drastically after parturition. This results in the hypothesis that the estradiol withdrawal state in the few weeks after parturition plays a role. It has been

demonstrated that depression-predisposed women are sensitive to significant steroid hormones fluctuation

1.4 Risk factors of Postpartum Depression and Anxiety:

Risk factors for PPD and Anxiety are pretty varied. This can range from physical and psychological factors associated with labor complications. The list below is a group of the risk factors for postpartum depression (Ghaedrahmati M, Kazemi A, Kheirabadi G, 2017).

1.4.1 Obstetric factors:

Complications arising from the pregnancy and during the peripartum period increase a mother's chance of developing PPD. These include high-risk pregnancies, which may include several prenatal hospital stays and emergency cesarean sections. Fetal variables have also been linked to postpartum depression and anxiety, including meconium passage, umbilical cord prolapse, and preterm or low-birth infants.

1.4.2 Psychological:

Premenstrual syndrome (PMS), a negative attitude toward the infant, a refusal to accept the gender of the baby, and a history of sexual assault are all enduring risk factors for postpartum depression and anxiety.

1.4.3 Social factors:

Postpartum depression may result from a lack of social support. These factors include marital sexual and physical abuse, which is a common kind of domestic violence. Verbal abuse can also play a role in the development of the condition. Cigarette Smoking during pregnancy is also a risk factor for developing PPD. Lack of social and partner support, depression, intimate partner

violence, stressful life events, unemployment and low socioeconomic status and unintended pregnancies have been highlighted as key risk factors of PPD (Tolossa, T. Fetensa, G., Yilma, M., 2020)

1.4.4. Lifestyle:

Diet has also been shown to be correlated with PPD and Anxiety. Vitamin B6 is a precursor in the formation of tryptophan and serotonin. Serotonin being a neurotransmitter that affects mood, then can lead to mood changes in postpartum if not taken adequately in the diet.

Activity and exercises have been shown to decrease depressive mood. It improves self-esteem by increasing endogenous Endorphins and opioids. Mothers who have been exercising during pregnancy have improved self–confidence, thus being able to solve problems well, reducing the risk of PPD and anxiety (Ghaedrahmati M, Kazemi A, Kheirabadi G, 2017).

1.4.5 Sleep:

Sleep deprivation has been shown to contribute to PPD. Mothers in the newborn unit have to adapt to different sleep patterns, which can increase the risk of PPD. A fresh development of depression symptoms in the postpartum period is highly correlated with infant sleep habits and maternal exhaustion. It has been demonstrated that offering support during the postpartum period lowers the likelihood of postpartum depression and anxiety (Signe K., 2009). The Newborn environment is also unpredictable and highly technological, has noise and decreased light exposure, which can contribute to depression in mothers having children in the Newborn Unit.

1.4.6 Family history:

Twin and family studies have provided some evidence of the contribution of genetics to PPD, with PPD being shown to be clustered in families (Forty L, Jones L, Macgregor S. 2010). Genetic studies have also provided evidence of similar polymorphism found in a depression not related to perinatal, like the Val66Met polymorphism of brain-derived neurotrophic factors (Figueira P, Malloy-Diniz L, Campos, S. 2010). Epigenetic DNA methylation changes that are estrogen-induced have also been linked with PPD

1.5 Effects of PPD

It has been demonstrated that postpartum depression has an impact on interactions between the mother, child, and family.

1.5.1 Maternal effects:

It has been shown that PPD affects the mother's physical and mental health. A study by Da costa et al, found that most mothers with PPD had role limitations, bodily pain, and more risk of weight retention after delivery (Da Costa D, Dritsa M, Rippen N., 2006). Those with PPD sought medical care more, which meant using more of their income in healthcare seeking, thus risk to economic instabilities (Eilat-Tsanani S, Merom A, Romano S,. 2012)

On mental health, women with PPD were found to have low esteem and are more likely to be dysphoric and sadder than mothers with depression. Also, they have a higher level of anger, which affects their bonding with their child (Lilja G, Edhborg M, Nissen E., 2012).

1.5.2 Effects on the infant:

Children of mothers suffering from PPD have been found to suffer more from physical health ailments. For example, for mothers whose depressive symptoms persist for more than five months, the children were found to have higher episodes of diarrhea illnesses (Adewuya AO, Ola BO, Aloba OO, 2008 and Okronipa HET, Marquis GS, Lartey A, 2012).

Infant mortality has been shown to be higher among children of mothers with PPD. This was found to be a 3X increase in children up to 6 months of age and a two-fold increase up to 12 months. This mortality decline from 6 months to 12 months could be due to interventions already instituted to treat PPD in mothers (Okronipa HET, Marquis GS, Lartey A, 2012)..

Children of untreated mothers with PPD also risk developing behavioral problems. This manifest has a language delay and change of sleep partners with excessive crying and irritability

A previous study in informal settlements of Kariobangi, Kenya among mothers with 6–a 16-year-old infant who were attending MCH clinic found that mothers with PPD were 6.14 times less likely to practice exclusive breastfeeding and 4.4 times more likely to have an

underweight child (Madeghe B, Kimani V, Vander, 2016)

1.5.3 Effects on the partner relationship and sexuality.

Mothers with PPD are found to have distant, cold and difficult relationship with partners especially in the first year of birth. The risk of romantic break – ups is higher than those who are have no had PPD. Resumption of sex among partners is also delayed in mothers with PPD than those with no PPD. Sexual dysfunction is 3X more in mothers with PPD than those with no PPD (Vliegen N, Casalin S, Luyten P, 2013 and Khajehei M, Doherty M, Tilley P, 2015).

As shown above the impact of PPD on family structure is of great magnitude. This necessitates early Identification and intervention to prevent such antecedent consequences.

1.6 Management of PPD.

On initiating treatment and management of ladies with PPD, one should consider that the mother could be lactating and thus the modality chosen should also be safe to the baby.

The first line manage of lactating mothers with PPD is psychotherapy. Mild to moderate postpartum depression can be managed by psychosocial and psychological psychotherapy (Stewart D, Vigod S. 2019).

If mother has moderate to Severe Depression and not responding to Psychotherapy then antidepressants should be added while psychotherapy is continued. Antidepressants that are considered to be safe for lactation are given. The first-choice management is medical using selective serotonin reuptake inhibitors (SSRIs). But if the SSRIs don't work, you might want to try serotonin-norepinephrine reuptake inhibitors instead (SNRIs). Once symptoms are well controlled the medication should continue for 6 – 12 months. The mother's concerns on the effect of medication to her child should be addressed.

Failure of the above modalities then Electroconvulsive Therapy (ECT) should be considered. The indication of ECT include: failure to respond to medication and therapy, Patients who have not responded to four consecutive treatment attempts, have psychotic depression, intend to commit suicide or infanticide, and refuse to eat, resulting in starvation and dehydration. ECT maybe also be considered safe for those mothers who are lactating (Anderson E, Reti I, 2009).

PPD has effects on the entire family, work and society. It also has the potential of affecting the physical health, and well-being of the mother, resulting in negative behaviour including self-harm and substance abuse and poor wellbeing (Stewart D, Vigo, S, 2016)

PPD affects both the mother and the child. It negatively affects postpartum bonding between the infant and the child affecting their relationship interfering with the infant's growth (Dubber S, Reck C, MüllerM, 2015) Mothers with PPD show high levels of negative and disengaged behaviour toward their infants compared to non-depressed mothers. They physically touch their children less with less affection and have few visual and vocal communication with them (Field, T., 2010

A previous study in informal settlements of Kariobangi Kenya among mothers with 6–16-year-old infant who were attending MCH clinic found that mothers with PPD were 6.14 times less likely to practise exclusive breastfeeding and 4.4 times more likely to have an

underweight child (Madeghe B, Kimani V, Vander et al. 2016).

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

The literature on PPD and its risk factors is given in this section.

2.1 Prevalence of postpartum Depression

A wide range prevalence of PDD has been reported in different studies and regions. This is due to differences in criteria used in its definition, time period and population characteristics (Hara, M, McCabe, J., 2013). In high-income nations, the prevalence ranges from 6.9 to 12.9% to more than 20% in underdeveloped nations (Molyneaux E, Poston L, Ashurst-Williams, S, 2010). The following studies highlights prevalence in different countries ranging from developed and developing countries.

Globally the prevalence of PPD has a varied range. Italy reported the lowest prevalence of 4.9% 9 Clavenna A, Seletti E, Cartabia, M, 2017) while china reported the highest prevalence of PPD at 27.4 (Deng A, Xiong R, Jiang T, 2014). Banti et al, did a study in Pisa Italy. He found out that minor depression prevalence among women covering a period of one year after child birth was found 9.6% (Banti S, Mauri M, Oppo A, 2011) while another study done by Navarro et al in Barcelona Spain covering minor and major depression and dysthymia over a six week period after child birth reported a prevalence of 9.2% (Navarro P, García-Esteve L, Ascaso C 2008). In a national survey done by Eaton et al, among women aged above 18 years in the United States, the 12 months period prevalence of major depression was found to be 10.1% using the DSM-IV tool (Eaton R, Keyes K, Krueger R, 2012).

As you can see the prevalence among these two developed countries seem to be similar at approximately 9%.

A number of studies have been done in Africa to assess the prevalence of PPD. Catherine Et al did a metanalysis involves 21 studies done in Africa (Catherine A, Laura B, Samuel N, 2020). The prevalence of PPD among the studies was found to be lowest in Morocco at 6.9% and highest in Uganda at 44% (Khajehei M, Doherty M, Tilley P, 2015). This shows that there is a great magnitude of PPD in Africa. Identifying tools to be used to screen for PPD and instituting interventions will of great benefit to the mothers. However, there remains few studies on PPD in Africa with the few available ones estimating its prevalence to be between 15-25% in most countries. However, its prevalence is thought to be higher than the global prevalence (Villegas L, McKay K, Dennis C, 2010).

Getu et al did a study in study in Ethiopia among women attending postnatal care in Debre Berhan. They assessed PPD using the EPDS scale where those with a score of ≥13 was considered as having PPD. The prevalence of PPD was found to be 15.6%. In a similar study done in Uganda by Kakyo et al, they found out 43% had Postpartum depressive symptoms (PDS), 27% had possible minor Depression (EPDS score 10-12) while 16% had probable major Depression (EPDS score of 13 and above) (Kakyo T, Muliira J, Mbalinda, S., 2012).

In Kenya Ongeri et al carried a cohort study in two public hospitals in Nairobi. They recruited adult women who attended maternity and child health clinics and lived in metropolitan areas with limited resources. The study involved 171 women. They found prevalence of PPD to be 18.7% at 6 – 10 weeks postpartum (Silva R, Jansen K, Souza L, 2012).

2.3 Literature review on the risk factors of postpartum depression.

As previously mentioned, several factors are linked to and thought to raise a mother's chance of developing postpartum depression.. These range from maternal factors, fetal factors and other medical interventions offered to the mother. These are discussed below.

2.3. 1 Maternal factors:

These are factors that are genetically inherent or external factors of influencing the mothers directly that are likely to risk her to develop PPD. A study by Silva et al, showed the highest risk being on those at the age of 13 – 19 years and lowest risk of PPD on those at age of 31 – 35 years old(Silva R, Jansen K, Souza L, 2012).

A maternal age especially first birth at young age is associated with increased risk of PPD.

A previous history of mental disorder has been found to increase the risk of a mother developing PPD. Using bivariate analysis, Lancaster et al. discovered that anxiety during pregnancy had a medium- to significant connection with depressive symptoms (Lancaster A, Katherine J, Heather A, 2021).

Having a relative with a mental illness could point to a genetic predisposition to a mother developing PPD. In a study by Abate et al, they found out that 9.1% of mothers with PPD had family history of mental illness (Abate D, Nigus A, Kefyalew D 2020).

It has been demonstrated that some life events, particularly negative ones, can raise the risk of PPD. Life events here refer to psychologically disturbing and significant occurrences that have affected the mother in the recent past. This can range to divorce, loss of a family member, loss of income etc. In a meta-analysis involving 15 studies, Lancaster et al, found them to be

significantly associated with PPD symptoms (Lancaster A, Katherine J, Heather A, 2021). Abate et al did a study involving 308 mothers in Ethiopia. The findings revealed that postpartum depression was four times more likely to affect bereaved or widower women than married women. [AOR = 4.17, 95% CI = 1.14, 15.20] (Abate D, Nigus A, Kefyalew D 2020).

In the same study above Abate et al found that mothers who had lost a family member or close relative during the previous six months were three times as likely to suffer from PPD than mothers who had not[AOR = 2.92, 95%CI = 1.01,8.50] (Abate D, Nigus A, Kefyalew D 2020).

Studies on the effect of parity on PPD have given contrasting results though more are leaning to multiparity being associated with high risk of PPD. Matin et al did a study invovlving 86 participants. They found that having 2 or more children was associated with occurrence of PPD than those are primipara. This could be due to higher psychological burden on the mother especially when compounded with poor psychosocial support (Mathisen S, Glavin K, Lien L, 2013).

2.3.2 Social factors:

Social support is a network of resources that are one's disposal to help in copying with a stress. This ranges from family, friends and community which offer either financial and psychological support in such moments. People who have social support have been found to copy up better with life stressors than those with none. In a study done in Ethiopia by Abate et al used Oslo-3 social support scale. They found that mothers with poor social support had 5x higher risk of developing PPD than those with strong social support [AOR = 5.11, 95% CI = 1.00, 26.18]. (Abate D, Nigus A, Kefyalew D 2020). A similar review by cannon et al looking at African

American and Hispanic origin women found low social support for the woman to result in PPD (Cannon, C., & Nasrallah, H. A 2020).

Partner conflict also has been found to be positively correlated with development of PPD. Ongeri et al carried a cohort study in two public hospitals in Nairobi. They recruited adult women who attended maternity and child health clinics and lived in metropolitan areas with limited resources. Conflict between the parents was found to raise the risk of PPD.(OR = 7.52, 95% CI: 2.65-23.13) (Ongeri L, Valentine W, Phelgona O, 2018)

Employment status especially at professional level is associated with low risk of PPD. Miyake et al carried a study among 771 Japanese women. Those employed had a lower risk of PPD (OR: 0.55 95% CI: 0.32 – 0.91). This inverse association was stronger for full time job employment. Those doing professional jobs had significantly reduced risk of PPD (OR: 0.25 (95% CI: 0.09-0.72) (Miyake Y, Tanaka K, Sasaki S, 2011)

In another study at KNH assessing PPD among mother with preterm neonates, low level of maternal education, low socioeconomic status, unplanned pregnancy and being unmarried and low birth weight of the infant was significantly associated with psychological distress among the postpartum mothers included in the study (Nyaribari, A. N. (2020).

In the study at KNH among mothers attending PNC clinics, PPD was significantly associated with low income and unemployment. However, the study had limitations in that the effect of the assessed factors was not quantified as an odd ratio, measures of effects were not determined, and other likely confounders were also not determined. (Virginia M. 2013)

In the comparative study at KNH newborn unit and MCH at Umoja or health, Intimate partner violence, sexual and emotional; abuse, unwanted pregnancy and low social support and socioeconomic status were significantly associated with Anxiety and PPD. However, this study had the limitations in that the two groups being compared are likely not to have been similar in other ch In the study in Western Kenya at MTRH, PPD was significantly associated with maternal education and marital status. A significant association was also found between Anxiety and maternal occupation, age and level of education. However, the study did not quantify the effect of these factors. Confounding was also not controlled for (Assessment of postpartum Depression and Anxiety among mothers of preterm neonates at newborn unit-Moi Teaching and Referral Hospital Eldoret, characteristics apart from the outcomes and exposure being investigated (Mutua, J. N, 2017)

2.3.3 Birth and infant related factors

Despite the widespread perception that giving birth prematurely is stressful, neither preterm birth nor low birth weight (LBW) have received enough consideration in PPD investigations. International reports on the prevalence of preterm vary significantly, in part due to different classifications used in different nations (Vigod S, Villegas L, Dennis C, 2010). However, LBW (less than 2500 g at birth) and premature delivery (37 weeks' gestational age (Gestational age)) are also frequent, However, few population-based PPD studies have included enough cases to calculate the precise risk of PPD among moms of premature and/or LBW newborns. Obstetric, neonatal, and general practitioners who could be the first point of contact should pay close attention to these factors (Vigod S, Villegas L, Dennis C, 2010)..

Even fewer studies have looked at maternal, baby, or obstetric factors that could change the association between preterm birth and PPD, for the purpose of identifying PPD in this situation.

According to Vigod et al's systematic review, mothers of preterm and low-birth-weight infants had a higher risk of PPD than mothers of children without these abnormalities . De Paula et al a systematic review on preterm birth as a risk factor of PPD. This involved 26 studies and 12 were included in the metanalysis. He carried the studies upto 24 weeks post delivery. 8 studies didn't find an association while the rest showed a strong association between Preterm birth and PPD (Navarro P, García-Esteve L, Ascaso C. 2008)

After correcting for potential confounding factors, Drewett et al. utilizing the EPDS (cut-off of >12) discovered that the risk of depression at 8 weeks postpartum was 1.6 times higher in moms of preterm infants than in mothers of term children [adjusted relative risk, 1.6 (95% CI, 1.2–2.1)]. This was the only study that took into account pregnancy-related sadness in multivariable modeling. Despite this constraint, the findings of the three other investigations were comparable (. Drewett R, Blair P, Emmett P, 2004).

In Nigeria, a study was carried out to determine whether postpartum depression among moms of preterm infants is higher than that among mothers of full-term newborns. A total of 33 mothers with preterm neonates and 27 with full term babies were included in the study. Compared to moms of term kids, those with preterm newborns had a higher rate of depression at 15.1% versus 3.7% (Kingi M, Muthoni M, Onesmus G, 2018).

King et al carried out a cohort study on depression among women with preterm delivery in Pumwani Maternity Hospital. Two hundred and ninety two pregnant women from Nairobi's

Pumwani Maternity hospital participated in their study. Those who had preterm delivery had 3.8X risk of developing postpartum depression (Kingi M, Muthoni M, Onesmus G, 2018)..

2.3.4 Obstetric factors:

It has been demonstrated that having a high-risk pregnancy increases the likelihood of experiencing postpartum depression. These risks may call for emergency operations like Caeserian section in ladies who want to have a natural childbirth thus increase the risk of PPD. Houston et al did a study involving 160 participants. He found that those who had preferred vaginal delivery, if they underwent Caesarean section, then they had a higher risk of developing PPD (P= 0.027) (. Houston A, Kaimal J, Nakagawa S, 2015)

The prevalence of PPD was found to increase by 63% after caesarean (Moameri H, Ostadghaderi M, Khatooni, 2019).

In the study in Western Uganda, depressive symptoms were positively correlated with having a husband with other female partners, the infant being unable to breastfeed, and negatively correlated with mother having received support from husband postnatally, living with husband or partner and low parity and the association was statistically significant (Kakyo T, Muliira J, Mbalinda, S, 2012).

In a study in Ethiopia among women attending postnatal care in Debre Berhan, widowed, having a child hospitalised, and having lost a close relative were found to be risk factors of PPD. Compared to women who had good social support, those with little social support were five times more likely to have PPD. Windows were four times more likely to experience PPD

compared to married women. Having a sick child hospitalised was associated with 3 times higher risk of PPD while having lost a relative in the last 6 months was associated with three times higher risk of PPD (Wubetu A, Engidaw N, & Gizachew K. 2020).

2.4 justification

Postpartum Depression is a devastating psychiatric disorder which is highly underdiagnosed and has received little research attention with paucity of data globally1. It is a common childbirth complication with adverse effects to the mother, with its associated suicide associated with 20% of postpartum mortality (Lindahl V, Pearson J, & Colpe, L, 2005). It also negatively affects the infants cognitive, emotional, and behavioural development (Feldman R, Granat A, Pariente C, 2009).

Anxiety and PPD are common and deleterious mental health disorders in women postpartum. This is partially attributed to the mother's worry and emotional exhaustion from caring for a premature newborn (Aftyka A, Rozalska-Walaszek I, Wróbel, A, 2017). However, their prevalence and contributing factors have been given less attention especially among mothers with preterm neonates (. Learman, L. A. (2018).

In Kenya, mental health issues have received little attention. With limited funding and scare human resources for the sector. Most of the mental health experts are concentrated in main referral health facilities with little attention to patients in peripheral health facilities like Pumwani. Many studies have attempted to determine the prevalence and risk factors of PPD among women in referral health facilities but for peripheral facilities there is paucity of data on

PPD despite these being the place where Most Births take place. Also those studies done in referral centres have been conducted in postnatal clinics have not been involving a special category of mothers nursing their babies in the Newborn Unit.

There has been an increase in interest in mental health well-being of mothers, especially during the postpartum period globally. However, limited research has been done on the subject especially in low- and middle-income countries including Kenya. With little focus given to mental health issues locally, especially among postpartum mothers. Finding out the incidence of postpartum depression and anxiety and its risk factors among various groups of new moms is an important step in drawing more attention to the issue. This study will focus on postpartum mothers with infants admitted to the newborn unit as there is a dearth of data regarding the prevalence of PPD and Anxiety among this cohort in Kenya.

With prevalence and risk factors of PPD varying from countries and regions to another, it is important that we get local studies done to provide local evidence regarding the prevalence and risk factors of PPD. With Pumwani being one of the main maternity facilities in the country,

receiving patients from different parts of Nairobi and neighbouring counties such as Kiambu and Machakos, the study at the facility will help provide nearly representative data regarding

Prevalence and risk factors of PPD and Anxiety.

The findings of this study will be essential in filling the existing gaps in knowledge regarding the epidemiology of PPD locally. It will also provide the much-needed evidence to inform the need for increased resources allocation for mental health to peripheral health facilities. The study will

also highlight the prevalence of the condition bringing to the attention of policy makers and facility management the need to prioritise mental health needs of women during the postpartum period. The results from the study will also inform the need for and design for interventions and the type of postpartum women to target for PPD and PPD prevention interventions.

Currently no published study has been done to look at the prevalence of Postpartum anxiety among Kenyan mothers. Especially among the group of those taking care of children in the newborn unit. Therefore looking at the prevalence of anxiety and its associated factors, will assist in intituting interventions geared to ensure better mental health to all mothers with babies in Newborn units in the country.

Finally, the study will advance our understanding of PPD and guide future research on the topic.

2.4 Research questions

1.What is the prevalence of postpartum depression among mothers with newborns in the Newborn Unit at Pumwani Maternity Hospital?

2, What is the prevalence of Anxiety among mothers with newborns in the New- born Unit at Pumwani Maternity Hospital?

3.Which factors are associated with postpartum Depression and Anxiety among mothers with newborns in the Newborn Unit at Pumwani Maternity Hospital?

2.5 Objectives

2.5.1 Broad objective

To determine the prevalence and risk factors of postpartum Depression and Anxiety among mothers with infants in the Newborn Unit at Pumwani Maternity Hospital

2.5.2 Specific objectives

1. To determine the prevalence of postpartum depression among mothers with infants in the Newborn Unit at Pumwani Maternity Hospital
2. To assess the prevalence of Anxiety among mothers with infants in Newborn Unit at Pumwani Maternity Hospital
3. To determine the risk factors of postpartum Depression and Anxiety among mothers with infants in the Newborn Unit at Pumwani Maternity Hospital.

CHAPTER THREE: METHODOLOGY

3.1 Study design

In the study, a cross-sectional study design was used. We chose a cross – sectional study as it is a study that can best assess prevalence and study the multiple associations after exposure. Also, cross – sectional study is relatively quick thus can be carried within the stipulated time of the study.

One weakness of cross -sectional study is it can't determine cause and effect. But now that our study is on association and not cause – effect, the design is well suited.

3.2 Study area

The study was conducted at Pumwani Maternity hospital newborn unit. Pumwani maternity hospital is the largest maternity hospital in Kenya conducts approximately 22000 deliveries annually.

Nearly 60 neonates are admitted in Pumwani maternity Hospital each day, with an annual admittance rate of about 4500

Pumwani hospital is located in kamukunji area east of Nairobi county.The hospital serves mainly low and middle income residing around eastlands nairobi.

Low socioeconomic status and residing in urban areas are predisposing factors associated with increase in depression in the general population.

3.3Study and target population

Mothers with newborns in the Newborn Unit at the Pumwani Maternity hospital were the target population.

3.3.1 Inclusion criteria

Mothers with newborns in the Newborn Unit at the Pumwani Maternity hospital.

Those who consented to take part in the research.

3.3.2 Exclusion criteria

Terminally ill mothers who cannot communicate well.

3.4 Sample size

The sample size was determined using Fisher's formula for sample size calculation.

$$\mathbf{n} = \frac{Z_{pq}^2}{d^2}$$

Where: n = is the needed sample size z = confidence interval at 95%1.96 according to the normal distribution table. p= 0.17

q = 1 – p

d = error tolerated q, 0.05

From a previous study at KNH, the prevalence of PPD among women with preterm babies was

reported to be 17% (Nyaribari, 2020). Hence p=0.17

1.96^2* 0.17*0.83/0.05^2

=216.8

Hence a sample size of 217 postpartum mothers was used in this study.

3.5 Sampling technique

With the number of mothers with children admitted to the newborn unit likely to be small at any given time, consecutive sampling method was used with all eligible mothers for the 3 months data being selected for the study.

3.6 Data collection

3.6.1 Data collection tools

A sociodemographic questionnaire was used for the collection of data from the participants. Participants' age, marital status, number of children, level of education and employment, income, and religion were in the first section of the questionnaire. The second section is gynaecological History, current birth history, previous known History of depression and/or Anxiety or other mental illness, Anxiety, History of domestic violence, social support, substance use.

The PPD was assessed using the Edinburgh Postnatal Depression Screening which consists of 10 items (Cox et al., 1987). This tool focuses on postpartum period mood with questions covering

aspects occurring in the last one week. Varying cut off is used but a score of above or equal to 13 is widely used as an indicator of PPD.

The choice of this tool was based on the fact that it is a validated tool with demonstrated acceptable clinical use for PPD assessment especially in Subsaharan africa including Kenya (Kakyo T, Muliira J, Mbalinda, S, 2012). Besides, the University of Nairobi Maternal and Child mental health working group members have previously translated it to Kiswahili and it has been used at the facility in previous studies (Ongeri L. Valentine W. Phelgona O, 2018)

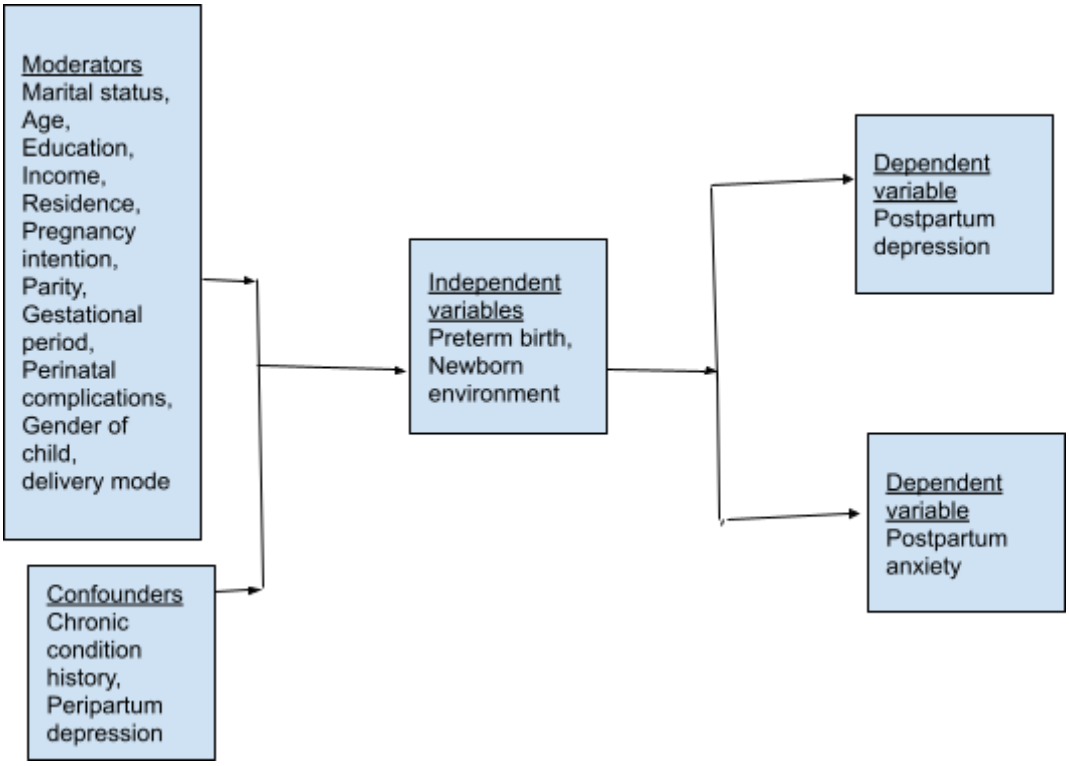
Beck Anxiety Inventory (BAI) was used to assess Anxiety. This is a 21-item tool rated on a 4 point Likert scale with the questions looking at symptoms the individual had experienced in the past, upto the day of study. The tool was found to have an internal consistency of 0.91 and a test reliability of 0.65 (Bardhoshi, Duncan, & Erford, 2016). Although Beck's Anxiety Screening tools have been used there's no anxiety specific instrument routinely used during the postpartum period (Learman L.A 2018). assessed newborn mothers in Moi Teaching and referral hospital using Beck Anxiety Inventory in newborn mothers and the prevalence of Anxiety was 63.3%.

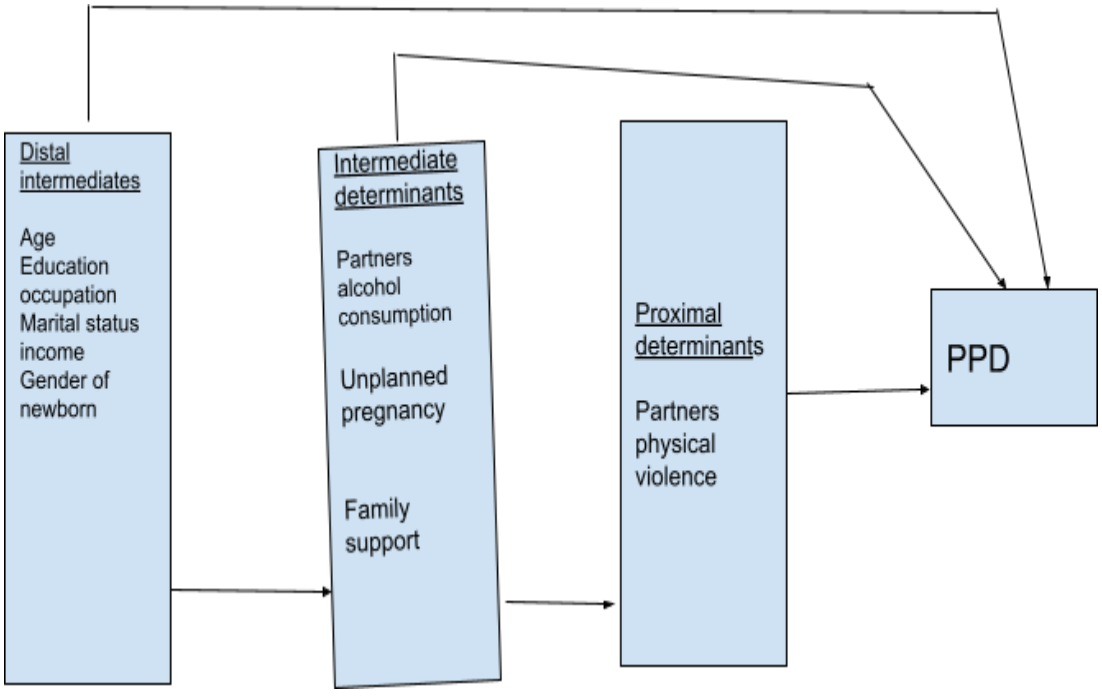
3.6.2 Data collection procedure

After receiving ethical approval for the study, the facility management was asked for permission to conduct the study there. The nurse in charge of the facility NBU was notified. Mothers with babies admitted to the NBU were approached and the study procedure and purpose explained to them in detail using Kiswahili language as it is spoken and understood by the majority of people. Their concerns were addressed, and their written consents sought.

The questionnaire was administered by the researcher to those who consented to participate with the following determinants.,

3.7 Study variables





3.8 Dependent variable

Postpartum Depression (yes/no). The outcome variable was presence of PPD with a score of ≥13 on the EDPS will be considered as having PPD.

Beck's Anxiety (mild, moderate, severe). the outcome variable will be presence of anxiety with a score of 26 -63 as severe , 8 to 15 as moderate 0 to 7 as mild.

3.9 Independent variables

Based on literature, the following variables will be used as independent variables and tested for association with PPD:

Obstetric factors: Mode of delivery, Parity, Antepartum illness, preterm delivery

Maternal factors: age, first birth age, mental disease history, Education level and mental disorders in the family history.

Newborn factors: Preterm baby, low birth weight, Neonatal illness, mode of feeding, Desired fetal sex versus the current gender.

Sociodemographic factors: Marital status, Partner violence, Socioeconomic status, education level.

Confounders

Health history: presence of any chronic condition or any complications during birth, History of diabetes, stress and Pre-partum depression

3.10 Data management and analysis

3.11 Data management

The data was double entered into excel for management, where it was cleaned, and any missing entry verified. The data was coded and cleaned ready for analysis.

3.12 Data analysis and presentation.

The data was imported into Statistical Package for Social Sciences (SPSS) version 23.0 for analysis. Both descriptive and inferential analysis were used. For descriptive analysis, frequencies and percentages were used for categorical variables while mean or median and their corresponding measures of dispersion standard deviation were used. The EPDS scores was categorised into binary (yes/no) depending on an individual's score. The prevalence of PPD and Anxiety was determined by and it is corresponding 95% confidence intervals (CI) determined. Data was analysed using Statistical Package for Social Sciences (SPSS).

Binary logistic regression was used to determine the association between presence of PPD and the independent variables and the resulting proportions and P values presented with P of <0.05 considered statistically significant. The results will be presented in form of tables, graphs and charts.

3.10 Ethical considerations

This research was carried out after approval from the Psychiatry department and KNH/UoN ethics and research committee. Before beginning the study, permission from the facility management was sought to conduct it at Pumwani Maternity Hospital.

The principal researcher explained to every patient about the research and gave each patient informed consent about the study. The researcher then got Consent from participants who agreed to participate in this study through writing. Patients who declined to participate in the study were not victimized and received their respective treatment as medically and surgically indicated. Patients who decided to opt out of the study were allowed do so at any stage of the study without victimization.

Mothers who were found with overt signs of postnatal depression got prompt psychiatry consult and treatment instituted as recommended by the psychiatrist. Those who broke down during the interview got psychotherapy and interview postponed to another day till when psychotherapist confirms mother could be ready for the study.

The patients were identified by study numbers. There was no use of really names or any identifier that could break patient confidentiality. Principal researcher kept all the data collection sheets under lock and key and soft copy materials safely accessed via a password in a computer. No information was shared with unauthorized person. Once the study is completed raw data collection sheets will be disposed safely by shredding.

The study results will be submitted to the university as a form of thesis. They will also be shared during relevant scientific forums including and not limited to seminars, conferences and journals.

CHAPTER 4: STUDY RESULTS

4.1 Sociodemographic factors

The study involved 217 participants.

The commonest age group was between 15 -24 years who accounted for 49% of the participants and the least was those aged 35 – 40 years as shown in figure 1 below. The mean age was 25.2 years. Note that the number of mothers delivering decline with age with a reduction of more than 6X from 15 -24 years to 35 – 40 years in mothers delivering.

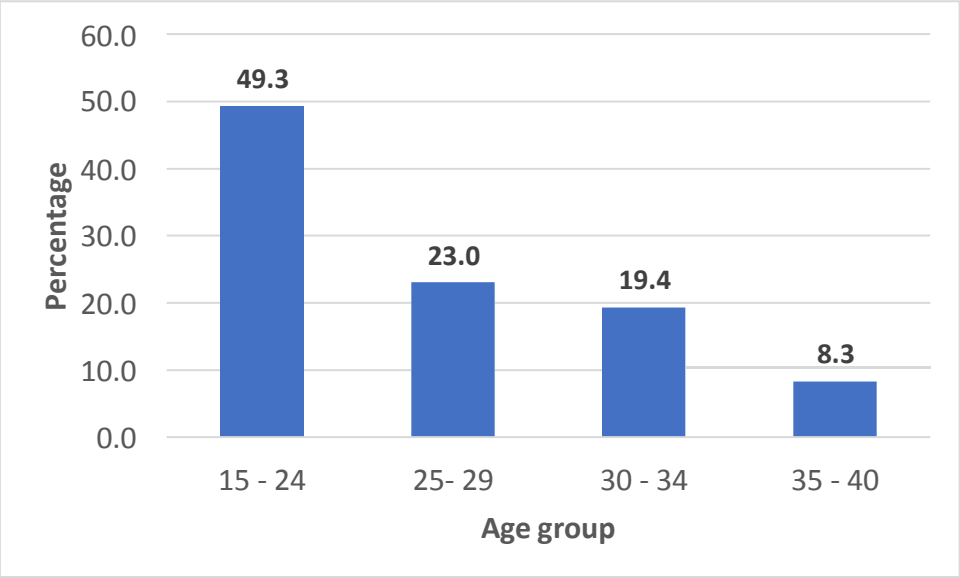


Figure 1: **Age groups of mothers**

The study involved 217 mothers who had neonates at the Pumwani NBU. Mothers were recruited using consecutive sampling method, and 217 mothers were recruited accounting for 1005 of sample size. Among the study subjects, be married accounted for more than half of the participants at 51.1%, with 46.1% having Secondary Education. Christians accounted for more

than three quarters of participants at 83.0% . The mothers who felt support from their partner was inadequate were more than 70% as shown in table 1 below.

Table 1: Sociodemographic factors:

	Parameter	Total	Percentage
Age groups	15 - 24	107	49.3
	25 - 29	50	23.0
	30 - 34	42	19.4
	35 - 40	18	8.3
Marital status	Married	111	51.1
	Single	80	36.9
	Divorced	26	12.0
Level of Education	Primary	37	17.0
	Secondary	100	46.1
	Tertiary	80	36.9
Religion	Christians	180	83.0
	Muslims	30	13.8
	Other	7	3.2
Partner support.	Adequate	65	30.0
	Inadequate	152	70.0

4.3 Obstetric and Infant factors

The research looked at the following obstetric factors: Mode of delivery, complications during pregnancy, complications at child birth, and gestation at delivery classifying the neonate as term or preterm. Vaginal delivery was the commoner mode of delivery accounting for75.1%. Most respondent reported complications during pregnancy and childbirth at 65.9% and 59.0% respectively. Most neonates were preterm accounting for 65% of all the neonates. This is summarized in table 2 below.

Table 2: Obstetric and Infant factors

Parameter		Total	Percentage
Mode of delivery.	Vaginal	163	75.1
	C section	54	24.9
Complications during pregnancy	Yes	143	65.9
	No	74	34.1
Complications at child birth.	Yes	128	59.0
	No	89	41.0
Preterm or Term	Term	76	35.0
	Preterm	141	65.0

4.4 Prevalence of PPD

Edinburgh Postnatal Depression Scale (EDPS) was used to determine if mother was depressed or not. A participant who scored ≥13 was considered as having postpartum depression. The prevalence of postpartum depression among mothers was found to be 17.1%. Majority of the

participants were found not to have depression at 82.9%. This is shown in the Pie chart in figure 2 below.

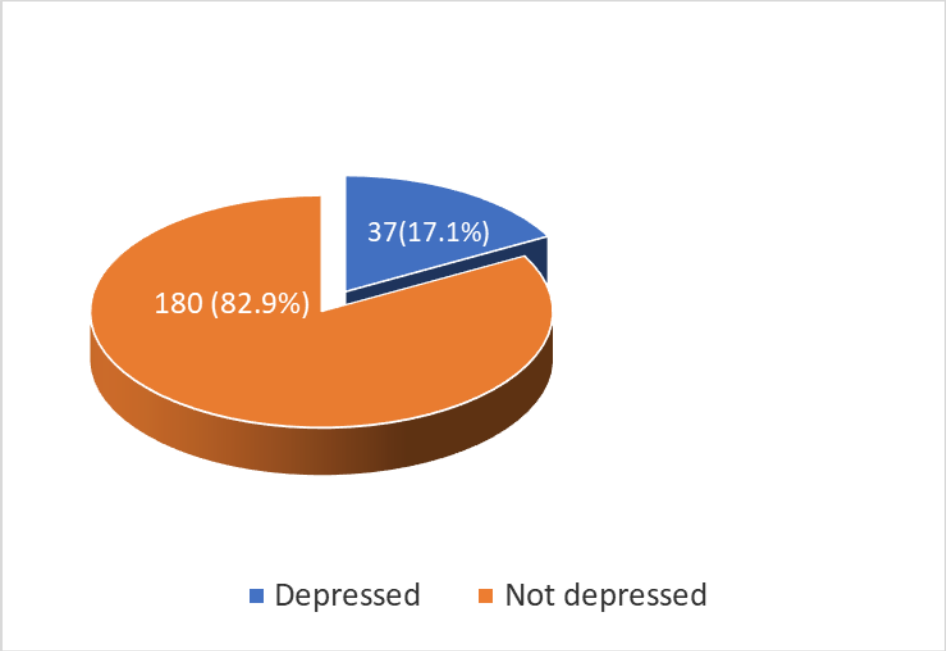


Figure 2: Pie chart showing prevalence of depression.

4.5 Factors associated with PPD

A Binary logistic regression was done to look at the relationship between sociodemographic, obstetric and neonatal factors on risk of Postpartum depression. This is summarized in the following 3 sections divided as listed.

4.5.1 Sociodemographic factors associated with Postpartum depression.

The research looked at the following sociodemographic factors and their association with PPD: age, marital status, level of education, religious affiliation, partner support and history of domestic violence. The association between each independent variable with dependent variable

(EPDS score) was determined using Binary logistic regression. Marital status was found to be having a statistically significant association with Postpartum depression 0.02. Mothers who were divorced had odds ratio of 4.3 of developing PPD. The other factors such as age, level of education, partner support and domestic violence had no statistically significant association with postpartum depression as their p values were more than 0.05. This is summarized in table 3 below.

Table 3 : **Sociodemographic factors and Postpartum depression.**

Binary logistic regression of sociodemographic factors associated with PPD					
Parameter		**EPDS >13 N(%)**	**EPDS>13 N(%)**	**Odds Ratio(95% CI)**	**p**
Age	19 -24	23**(21)**	84(**79)**	1	0.271
	25 - 29	5(**10)**	45**(90)**	0.41(0.14 - 1.14)	
	30 - 34	7 **(17)**	35**(83)**	0.73 (0.29 - 1.86)	
	35 - 40	2 **(11)**	16**(89)**	0.46 (0.1 - 2.13)	
Marital status	Married	14 **(12.6)**	97**(87.4)**	1	0.02
	Single	13 **(16.3)**	67(83.8)	1.34 (0.59 - 3.04)	
	Divorced.	10 **(38.5)**	16(61.5)	4.33 (1.64 - 11.41)	
Level of Education	Primary	10 **(26.3)**	27(71.1)	1	0.11
	Secondary	12 **(12.0)**	88(88.0)	0.37 0.14 - 0.95	
	Tertiary	15 **(18.8)**	65(81.3)	0.62 0.25 - 1.56	
Religious affiliation.	Christians	27 **(15.0)**	153(85.0)	-	-
	Muslims	10 **(33.3)**	20(66.7)	-	
	Others	4 **(57.1)**	3(42.9)	7.56 1.6 - 35.66	
Partner Support	Adequate	11**(16.9)**	54(83.1)	1	0.97
	Inadequate	26 **(17.1)**	126(82.9)	1.01 0.47 - 2.2	
Domestic violence	No	5 **(25.0)**	15(75.0)	1	.34
	Yes	32 **(16.2)**	165(83.8)	1.72 0.58 - 5.06	

4.5.2 Obstetric factors affecting Postpartum depression.

The study looked at the following obstetric factors and their association with PPD: Mode delivery, complications during pregnancy, complications at child birth and Parity. Among of the obstetric factors analyzed to determine their association with PPD, Mode of delivery (P<0.01),

having complications at delivery or at child birth and the parity of the patient were not significantly associated with PPD as shown in the table 4 below. Note that mothers who delivered via CS had odds ratio of 2.85 of developing PPD.

Table 4: **Obstetric factors affecting Postpartum depression**.

Binary logistic regression of obstetric factors associated with PPD					
Parameter		**EPDS >13 N(%)**	**EPDS>13 N(%)**	**Odds Ratio(95% CI)**	**p**
Mode of delivery	Vaginal	21 (12.9)	142 (87.1)	1	<0.01
	CS	16 (29.6)	38(70.4)	2.85 1.36 - 5.98	
Complications during pregnancy	No	23 (16.1)	120 (83.9)	1	0.60
	Yes	14 (18.9)	60 (81.1)	0.82 0.39 - 1.71	
Complications at child birth.	No	18 (14.1)	110 (85.9)	1	0.16
	Yes	19 (21.3)	70 (78.7)	0.6 0.3 - 1.23	
Parity	Primipara	11 (26.2)	31 (73.8)	1	0.12
	Multipara	26 (14.9)	149 (85.1)	0.45 0.2 - 1.01	

4.5.3 Neonatal factors affecting Postpartum depression.

The neonatal factors affected postpartum depression assessed included: desired baby gender, modality of feeding and if child was born at term or preterm. Using binary logistic regression, the modality of feeding was positively and statistically significant associated with postpartum depression (P<0.05; OR-5.36). This meant those who were giving expressed milk had a 5X risk

of developing PPD than those Breastfeeding. Other factors such as the desired gender of baby and if baby was born preterm or at term, didn't have statistically association with PPD as summarized in table 5 below.

Table 5: **Neonatal factors affecting Postpartum depression.**

Binary logistic regression of Neonatal factors associated with PPD					
Parameter	**Parameter**	**EPDS >13 N(%)**	**EPDS>13 N(%)**	**Odds Ratio(95% CI)**	**P Value**
Desired baby gender.	No	21(**19.6)**	86(**80.4)**	1	0.32
	Yes	16**(14.5)**	94(85.5)	1.43(0.7 - 2.93)	
Feeding modality	EBM	7(**6.5)**	100(93.5)	1	<0.05
	Breastfeeding	30(**27.3)**	80(72.7)	5.36(2.24 - 12.83)	
Born at Term or Preterm	Term	14**(18.4)**	62(81.6)	1	0.70
	Preterm	23(**16.3)**	118(83.7)	0.86(0.42 - 1.79)	

4.6. PostPartum Anxiety:

4.6. Prevalence of postpartum anxiety

Beck Anxiety Inventory score (BAI) was used to determine if mother had anxiety or not. A participant who scored equal or more than 26 was considered as having postpartum anxiety. The

prevalence of postpartum anxiety among mothers was found to be 24.4%. More than three quarters of the mothers didn't have Postpartum anxiety at 75.6%. This is shown as the Pie chart in figure 3 below.

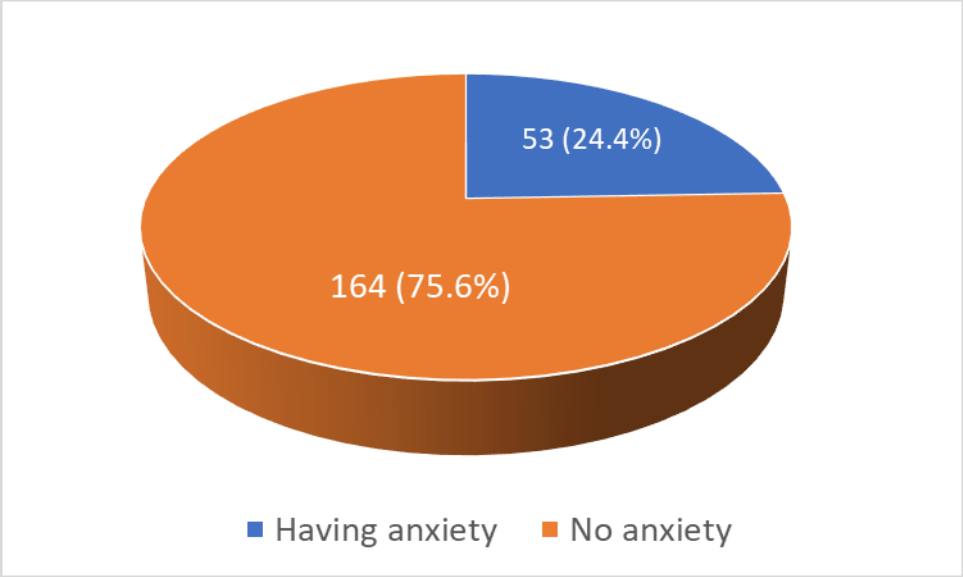


Figure 3: Prevalence of postpartum anxiety.

4.7 Factors associated with postpartum depression.

4.7.1 Sociodemographic factors associated with PPA:

The association between each independent variable for sociodemographic factors was determined using Binary logistic regression. The research looked at the following factors: age, marital status, level of education, religious affiliation, partner support and history of domestic violence. Four factors were found to have a statistically significant association with Postpartum anxiety. These included, Marital status, Level of education, religious affiliation and Domestic

violence with P values 0.01, <0.05, <0.05 and 0.03 respectively. Those single had an odds ratio of 1.84 as a risk of developing postpartum anxiety, while those divorced had OR of 8.85. The other factors which included age and partner support had no statistically significant association with postpartum anxiety. For religious affiliation the number of those in other religion was quite small. This could not be analyzed the smaller numbers to come up with statistically significant conclusions. This is summarized in table 6 below.

Table 6: **Sociodemographic factors affecting Postpartum anxiety.**

Binary logistic regression of sociodemographic factors associated with PPA					
Parameter		**BAIS (Yes) >26N (%)**	**BAIS (No)>26 N(%)**	**Odds Ratio (95% CI)**	**p**
Age	19 -24	22 (20.6)	85(79.4)	1	0.20
	25 - 29	17 (34.0)	33(66.0)	1.99 0.94 - 4.21	
	30 - 34	8 19.0)	34 (81.0)	0.91 0.37 - 2.24	
	35 - 40	6 (33.3)	12 (66.7)	1.93 0.65 - 5.72	
Marital Status	Married	17 (15.3)	94 (84.7)	1	0.01

	Single	20 (25.0)	60 (75.0)	1.84 0.89 - 3.8	
	Divorced.	16 (61.5)	10 (38.5)	8.85 3.44 - 22.74	
Level of education.	Primary	11 (29.7)	26 (70.3)	1	0.05
	Secondary	8 (8.0)	92 (92.0)	0.21 0.07 - 0.56	
	Tertiary	24 (30.0)	56 (70.0)	1.01 0.43 - 2.37	
Religious affiliation.	Christians	38 (21.1)	142 (78.9)	-	_
	Muslims	15 (50.0)	15 (50.0)		
	Others	0 (0.0)	7 (100.0)	0	
Partner Support	Adequate	14 (21.5)	51 (78.5)	1	0.51
	Inadequate	39 (25.7)	113 (74.3)	1.26 0.63 - 2.52	
Domestic violence	No	9 (45.0)	11 (55.0)	1	0.03
	Yes	44 (22.3)	153 (77.7)	0.35 0.14 - 0.9	

4.7.2 Obstetric factors affecting Postpartum anxiety.

The study looked at the following obstetric factors and their association with anxiety: Mode delivery, complications during pregnancy, complications at child birth and Parity. The association between these obstetric factors and dependent variable (BAIS) was analyzed. Two factors were found to have significant association with postpartum anxiety i.e. having complications during pregnancy and Parity of the patient with P (0.05, 0.05 respectively. The other factors are summarized in table 5 below.

Table 7: Obstetric factors affecting Postpartum anxiety.

Binary logistic regression of obstetric factors associated with PPA					
Parameter		**BAIS (Yes) >26N (%)**	**BAIS (No)>26 N(%)**	**Odds Ratio (95% CI)**	**p**
Mode of Delivery	Vaginal	35 (21.5)	128(78.5)	1	0.01
	CS	18 (33.3)	36 (66.7)	2.85 1.36 - 5.98	

Complications during pregnancy	Yes	22 (15.4)	121 (84.6)	1	< 0.05
	No	31 (41.9)	43 (58.1)	0.25 0.13 - 0.48	
Complications at child birth.	NO	35 (27.3)	93 (72.7)	1	0.23
	Yes	18 (20.2)	71 (79.80)	1.48 0.78 - 2.84	
Parity	Primipara	15 (35.7)	27 (64.3)	1	0.07
	Multipara	38 (21.7)	137 (78.3)	0.5 0.24 - 1.03	

4.7.3 Neonatal factors affecting Postpartum anxiety.

Three neonatal factors were considered in this study: Desired gender, modality of feeding and Gestation at birth (preterm or term). Note that those mothers who desired a specific baby gender were 110. These accounted for 50.7% of mothers. Thus, no much significant in the ratio of those who want a specific gender of baby and those who didn't need a specific gender. None of the factors had a statistically association with postpartum anxiety. as summarized in table 5 below.

Table 8: **Neonatal factors affecting Postpartum anxiety.**

Binary logistic regression of Neonatal factors associated with PPA					
Parameter		**BAIS (Yes) >26N (%)**	**BAIS (No) >26N(%)**	**Odds Ratio (95% CI)**	**p**
Desired baby gender.	No	23 (21.5)	84 (78.5)	1	0.32
	Yes	30 (27.3)	80 (72.7)	0.73 0.39 - 1.36	

Feeding modality	EBM	22 (20.6)	85 (79.4)	1	0.19
	Breastfeeding	31 (28.2)	79 (71.8)	1.52 0.81 - 2.84	
Preterm and term	Term	20 (26.3)	56 (73.7)	1	0.64
	Preterm	33 (23.4)	108 (76.6)	0.86 0.45 - 1.63	

CHAPTER 5: DISCUSSION, CONCLUSION, RECOMMENDATIONS AND LIMITATIONS.

5.0 Sociodemographic factors.

The study involved 217 mothers. The mean age was 25.2, with most mothers reporting to be married that is 49%. In a regional study done by Kakyo et al (2012) in Uganda, the mean age was 24 years, which is similar to the mean age group in our study. Kakyo et al (2012)study, involved mothers in the post natal clinics which is not in a similar set up like our study, but this had similar findings in terms of mean age of mothers. Majority of the participants were married, accounting for more than half of the participants at 51%. Similar regional study by Kakyo et al

(2012), also found majority of participants to be married at 61%. Those who subscribe to Christianity accounted for majority at 83% of the participants being Christians. This is in keeping with the Kenya Demographic Survey which showed the prevalence of Christians being 91.5% (Ministry of Health. Kenya Demographic and Health Survey 2022). On the level of education most mothers had completed secondary education. This accounted for 46.1% of the participants. According KDHS survey 2022, involving individuals aged 15 – 49 years, those who had completed secondary education were found to be the majority at 38% (Ministry of Health. Kenya Demographic and Health Survey 2022). This percentage is lower than in our study. The reason being, KDHS included all individuals between 15 -17 years who are unlikely to have completed their secondary education. In our study, only individuals between the age of 15 with children in Nursery were involved. These are less than normal population in that age group thus making our percentage of those who had completed secondary school to be higher than in KDHS.

5.1 Prevalence of postpartum depression

Edinburgh Postnatal Depression Scale (EDPS) was used to determine if mother was depressed or not with anyone scoring ≥13 considered to have depression. The prevalence of postpartum depression among mothers was found to be 17.1%. Linnet et al carried a prospective study looking at the prevalence of perinatal PPD[57]. In the study the prevalence of PPD was 18.7%. This prevalence is similar to our study especially now that it was done in the same set up with similar prevailing sociodemographic, obstetric and neonatal factors. Also a regional study by Kakyo et al (2012) in Uganda who found the prevalence for PPD to be 16.3%. Also, studies done in Egypt and India showed a prevalence of 17.9 and 15.8 Respectively (Saleh E-S, El-Bahei W,

del El-Hadidy, 2013 and Gupta S, Kishore J, Mala Y, Ramji S., 2013). This relatively similar to our findings of prevalence of 17.1%. These studies have been done in sub-Saharan Africa which have similar prevailing sociodemographic and health factors, thus gave similar findings with out study. The above studies were carried out for postnatal mothers coming to clinic.

Studies done in developed countries showed lower rates of postpartum depression. For example in Eberhard-Gran et al (2010) population based study in Norway, found a PPD prevalence of 1.6%[60]. A similar study in Denmark by Nielsen et al found a prevalence of 5.5%. The two mentioned studies were carried in developed countries with high social support. Also these were community based studies while ours was hospital based. This could explain the difference between their studies and ours. Similar studies in clinical set up in sub-Saharan Africa have been shown to have similar prevalence like our study as mentioned above.

5.1 Factors associated with Postpartum Depression.

Factors associated with postpartum depression were classified into three: Sociodemographic factors, Obstetric factors and Neonatal factors. These are discussed in the subsections below.

5.1.2 Sociodemographic factors:

The study looked at the following sociodemographic factors: age, marital status, level of education, religious affiliation, partner support and history of domestic violence. Among study participants, marital status was found to have a statistically significant correlation with postpartum depression P = 0.02. Those who were divorced were found to be 4X likely to have

PPD than those married. This could be marital support being an important factor in mental Health. Also having had a divorce can affect mental health negatively thus worsening or manifesting as postpartum depression among those divorced. Sustained economic stress from one partner can lead to elevation of cortisol levels. This increase vulnerability to developing depression, thus the positive association of divorce and PPD (Saleh E-S, El-Bahei W, del El-Hadidy, 2013). Beck et al (2001) in a metanalysis involving 84 articles found a moderate association between poor marital relationship and postpartum depression P =0.02. This is consistent with our study and confirms that intimate marital problems can be a quite stressful significant events that can affect postpartum depression.

Participants were classified to three groups according to religious affiliation: Christians, Muslims and others. The prevalence of depression in those who were neither Muslims and nor Christians was found to be 57.1%. The number of those who were not Muslims or Christians was quite small accounting for only 3.2% of the participants and thus could not make significant conclusions on the impact of religion on PPD. Though a study done by Musau et (2013) done in Kenyatta National hospital found no significant association of religion and PPD. In this study He had classified the participants to Christians and Muslims only. The other groups who are neither Muslims nor Christians were left out or not mentioned in the study. Ongeri et al (2018) study, grouped Christian affiliation to Protestants, Catholics and others. This different ways of classification of Christian affiliation in different studies made it difficult to make comparisons.

Other Sociodemographic factors: age, level of education, partner support and domestic violence were found to have no significant statistic association with PPD. These match with study done by Ayse et al (2017), which found that these factors are not positively correlated with PPD.

5.1.3 Obstetric factors affecting Postpartum depression.

Among of the obstetric factors analyzed to determine their association with PPD were: Mode of delivery, having complications at delivery or at child birth and the parity of the patient. Mode of delivery had a statistically significant association with PPD (P <0.01 OR: 2.85: 1.36 – 5.98). Those who delivered via CS had 2.85X risk of developing PPD (OR: 2.85: 1.36 – 5.98).

This was different from Fiala A, et al (2017) findings, which found mode of delivery not to be having a significant association with PPD P 0.087 OR1.5 (0.8; 2.9). The difference from our study is that Fiala et al looked at PPD at 6weeks and 6 months post-partum while our study involved assessment of PPD at a point in time. At 6 months most could have healed from surgery thus CS being a stressor is minimal thus have less likely association with PPD.

The other remaining factors: complications during pregnancy or at child birth and the parity of the patient showed no statistically significant association with PPD (P = 0.060, 0.16, 0.12 respectively). Fiala et al (2017)study also found no significant association of Parity and PPD (P = 0.743 OD: 1.1 (0.7; 1.5)

5.1.4 Neonatal factors affecting Postpartum depression.

The following neonate factors were analyzed using binary logistic regression to assess their association with PPD: Desired baby gender, modality of feeding and gestation at birth which was classified as term or preterm.

Only the modality of feeding was positively and statistically significant associated with postpartum depression P (<0.05: 2.24 – 12.83). This is similar to a study done by Cox et

al(1987) that found not breastfeeding to have positive association with PPD P = 0.04. Also a study done by Dunn et al (2006) showed a significant association between not breastfeeding and PPD OR = 0.28, p = 0.007. Neuroendocrine mechanisms have been shown to ameliorate the depressive mood symptoms. Oxytocin ameliorates production of cortisol, which is a stress hormone[68]. This could explain less risk of PPD in those breastfeeding. Even so, there also contrasting results in other studies. It could be that depressed mothers will have a challenge with breastfeeding. This has been postulated to be due to less response to stress relieving hormones e.g. oxytocin to these mothers (Stuebe A, Grewen K, Pedersen C, 2012).

Other factors such as the desired gender of baby and if baby was born preterm or at term P(0.32 and 0.70 respectively), didn't have statistically association with PPD. Similar study done by Fiala et al (2017) found no statistically significant relationship between the preterm (P = 0.534, OR 0.6 (0.1; 2.7) and desired gender (P = 0.38, OR:1.2 (0.8; 1.7)

5.2 POSTPARTUM ANXIETY.

5.2.1 Prevalence of postpartum anxiety

Postpartum anxiety was determined by Beck Anxiety Inventory score (BAI). A score of above 26 labelled a participant to be having anxiety while a lower score was considered to not having anxiety. Fifty-three out of two hundred and seventeen participants were found to have Postpartum anxiety. This translates to a prevalence of postpartum anxiety of 24.4%. Mutua et al (2017), in a comparative study looking at postpartum anxiety and depression in mothers with pre-term births in Kenya, they found the prevalence of anxiety to be 30% which is relatively similar to our study. Regional studies have also shown similar prevalence of postpartum anxiety.

In a cross-sectional study by Marie et al (2020) in Rwanda, the prevalence of Postnatal anxiety was found to be 28.2%. This is similar to Doyle et al (1994) study which found the prevalence to be 25% in Canada. Some studies have shown a higher prevalence especially the self-reported studies rather than interviews or researcher administered questionnaire. For example, Grant et al (2008) study, showed a prevalence of 33%. The difference could be explained as this study was a self-reporting study, while we did a researcher administered questionnaire. Self-reporting removes the bias of participant being observed so maybe more objective in giving answers.

5.2.2. Sociodemographic factors and association with Postpartum Anxiety.

Binary logistic regression was used to determine the association between sociodemographic factors and risk of having Post partum anxiety. Among the factors analyzed, four were found to have a statistically significant association with Postpartum anxiety. The factors were Marital status, Level of education, religious affiliation and Domestic violence with P (0.01, <0.05, <0.05 and 0.03 respectively. Participants who were divorced were found to be 8X likely to have postpartum anxiety. (P: 0.01 8.85 (3.44 -22.74). This can be attributed to anxiety of taking care of a child alone and other increased responsibilities. This is similar to a study done by Asres et.al (2022) which showed that divorced mothers had high odds of developing postpartum depression. (AOR = 3.16, 95% CI: 2.03, 4.91) domestic violence could also worsen the anxiety due to anticipated violence that a mother experiences at home.

The remaining factors i.e age and partner support had no statistically significant association with postpartum depression (P 0.20 and 0.51 respectively). This is similar to Loredana et al study that showed no significant association of age and partner support with Post partum anxiety (P 0.067

OR: 0.44 (0.18–1.06)[75]. Age of mother was also found not to be statistically significant in its association with postpartum anxiety in a study done by Christy et al (2012). P = 0.24[74]

5.2.3 Obstetric factors and association with Postpartum anxiety.

The following obstetric factors were analyzed in this study: Mode of delivery, having complications at delivery or at child birth and the parity of the patient. Mode of delivery and having complications during pregnancy had a positive association with Postpartum anxiety (P 0.01 and <0.050 respectively). In our study complications during delivery had no significant association with Postpartum anxiety P = 0.23. Complication during child birth had no significant association in a study done by Loredana et al (2021). P = 0.148 1.60 (0.85–3.04). Despite their study being multicenter it gave similar findings like our study.

The remaining factors which included Complications at child birth and parity had no significant association with Postpartum anxiety.

5.3 Conclusion;

This study aimed to look at the prevalence of postpartum depression and anxiety. The prevalence of PPD was 17.1 % and that one of anxiety was 24.4%.

Positive correlated factors with PPD included Divorce and religious affiliation. Also, mode of delivery and not breastfeeding showed significant correlation with PPD.

Positively correlated factors with Postpartum anxiety are were Marital status, Level of education, religious affiliation and Domestic violence with P (0.01, <0.05, <0.05 and 0.03 respectively.

5.4 Recommendations:

The prevalence of PPD and post-partum anxiety is 17.1 and 24.4 respectively. This show that 1 in 5 and 1 in 4 mothers in Newborn unit have PPD and Post partum depression respectively. We recommend routine use of screening tools for the two and intervention be instituted to manage those found with the diagnosis.

Patient with specific factors found to have high risk of PPD: Divorced and Underwent CS should be closely evaluated for PPD and anxiety and that way, the problem be identified early and interventions instituted.

A community-based study to be done to determine the actual prevalence of PPD and Postpartum anxiety in Kenya at large as this was a single centre study.

5.5 STUDY LIMITATIONS

1. Frequent breastfeeding which is every 3 hours: Mothers were interviewed when they have completed their breastfeeding session, which provided a short duration for interview before they went to rest waiting for next session.

2. Mothers answers were self-reported. Self-reported measures are prone to social desirability bias, especially in conditions with stigma thus mothers may choose not to report such parameters. Example is family history of mental illness. Mothers will be assured of their confidentiality and this will improve in addressing this bias.

3. This study was done in a single centre and hospital based, focusing on mothers with children in Newborn unit so may not reflect the country's true prevalence.

REFERENCES

1. Abate D, Nigus A, Kefyalew D. Prevalence of postpartum Depression and associated factors among postnatal care attendees in Debre Berhan, Ethiopia. BMC Pregnancy Childbirth;30;20(1):189
2. Adewuya AO, Ola BO, Aloba OO, et al. Impact of postnatal Depression on infants' growth in Nigeria. J Affect Disord 2008; 108(1–2): 191–193
3. Aftyka A, Rozalska-Walaszek I, Wróbel, A, Bednarek, A, et al. Support provided by nurses to parents of hospitalised children - cultural adaptation and validation of Nurse Parent Support Tool and initial research results. Scand J Caring Sci, 2017l 31(4), 1012-1021.
4. Anderson E, Reti I. ECT in pregnancy: a review of the literature from 1941 to 2007. Psychosom Med. 2009 ;71(2):235-42.
5. Asres B, Jon A, Wenbo P. An examination of the association between marital status and prenatal mental disorders using linked health administrative data. BMC Pregnancy and Childbirth. 2022: 22(735)

6. Ayse F, Nezaket K, Ebru As et al. Sociodemographic and clinical features of postpartum depression among Turkish women: a prospective study. BMC Pregnancy and Childbirth: 2017;17(1):104.
7. Banti S, Mauri M, Oppo A et al. From the third month of pregnancy to 1 year postpartum. Prevalence, incidence, recurrence, and new onset of depression. Results from the perinatal depression-research & screening unit study. Compr Psychiatry, 2011; 52(4), 343-351.
8. Beck, C. T. Predictors of postpartum depression: an update. Nursing Research, (2001:50, 275-285.
9. Bloch, M., Daly, R. C., & Rubinow, D. R. Endocrine factors in the aetiology of postpartum depression. Compr Psychiatry. (2003).:44(3), 234-246.
10. Cannon, C., & Nasrallah, H. A. A focus on postpartum Depression among African American women: A literature review. Ann Clin Psychiatry. 2020 31(2), 138-143.
11. Catherine A, Laura B, Samuel N et al. The magnitude of postpartum depression among mothers in Africa. Literature Review. Pan Afr Med J 2020; 25;37:89
12. Christy M, Naveen R, Avita R et al. Prevalence and Determinants of Postpartum Anxiety among Women Availing Health Services at a Rural Maternity Hospital in South India. J South Asian Feder Obst Gynae 2021;13(1):1–5.
13. Clavenna A, Seletti E, Cartabia, M, et al. Postnatal depression screening in a paediatric primary care setting in Italy. BMC Psychiatry. 2017;17(1), 42
14. Cox J. L., Holden J. M., Sagovsky R. Detection of postnatal depression: development of the 10-item edinburgh postnatal depression scale. British Journal of Psychiatry. 1987;150:782–786.

15. Da Costa D, Dritsa M, Rippen N, et al. Health-related quality of life in postpartum depressed women. Arch Womens Ment Health 2006; 9(2): 95–102.
16. de Paula E, de Rezende M, Menezes P et al. Preterm birth as a risk factor for postpartum Depression: A systematic review and meta-analysis. J Affect Disord. 2019;259:392–403.
17. Deng A, Xiong R, Jiang T, et al. Prevalence and risk factors of postpartum depression in a population-based sample of women in Tangxia Community, Guangzhou. Asian Pac J Trop Med, (2014); 7(3), 244-249.
18. Drewett R, Blair P, Emmett P, et al. Failure to thrive in the term and preterm infants of mothers depressed in the postnatal period: a population-based birth cohort study. J Child Psychol Psychiatry, 2004;45(2), 359-366.
19. Doyle-Waters MMR. Anxiety scale for pregnancy: development and validation [master thesis]. Vancouver, Canada: The University of British Columbia, 1994.
20. Dubber S, Reck C, MüllerM, et al. Postpartum bonding: the role of perinatal Depression, Anxiety and maternal-fetal bonding during pregnancy. Arch Womens Ment Health. 2015;18(2), 187-195.
21. Dunn S., Davies B., McCleary L., Edwards N. et al. The relationship between vulnerability factors and breastfeeding outcome. Journal of Obstetric, Gynecologic, & Neonatal Nursing. 2006;35(1):87–97.
22. Eaton R, Keyes K, Krueger R et al. An invariant dimensional liability model of gender differences in mental disorder prevalence: evidence from a nationalsample. J Abnorm Psychol, 2012; 121(1),282-288.

23. Eberhard-Gran M, Eskild A, Tambs K et al. Depression in postpartum and non-postpartum women: prevalence and risk factors. Acta Psychiatr Scand. 2002;106(6):426–33.

24. Eilat-Tsanani S, Merom A, Romano S, et al. The effect of postpartum depression on women's consultations with physicians. Isr Med Assoc J 2006; 8(6): 406–410.

25. Feldman R, Granat A, Pariente C, et al. Maternal depression and Anxiety across the postpartum year and infant social engagement, fear regulation, and stress reactivity. J Am Acad Child Adolesc Psychiatry. 2009;48(9), 919-927.

26. Fiala A, et al. Sociodemographic and delivery risk factors for developing postpartum depression in a sample of 3233 mothers from the Czech ELSPAC study. BMC Psychiatry. 2017;17(1):104

27. Field, T. Postpartum depression effects on early interactions, parenting, and safety practices: a review. Infant Behav Dev. 2010;33(1), 1-6.

28. Figueira P, Malloy-Diniz L, Campos, S et al. An association study between the Val66Met polymorphism of the BDNF gene and postpartum depression. Arch Womens Ment Health. 2010; 13(3):285-289.

29. Forty L, Jones L, Macgregor S. et al. Familiarity of postpartum Depression in unipolar disorder: results of a family study. Am J Psychiatry. 2006:163(9):1549-1553.

30. Grant KA, McMahon C, Austin MP. Maternal anxiety during the transition to parenthood: a prospective study. J Affect Disord. 2008;108:101–11. 10.1016/j.jad.2007.10.002

31.31.

32. Ghaedrahmati M, Kazemi A, Kheirabadi G, et al. Postpartum depression risk factors: A narrative review. J Educ Health Promot. 2017;6:60.

33. Gupta S, Kishore J, Mala Y, Ramji S et al. Postpartum depression in north Indian women: prevalence and risk factors. J Obstetrics Gynecol India. 2013;63(4):223–9.

34. Hara, M, McCabe, J. Postpartum depression: Current status and future directions. Ann Rev Clin Psychol. 2013;9:379-407.

35. Houston A, Kaimal J, Nakagawa S et al. Mode of delivery and postpartum depression: The role of patient preferences. Am J Obstet Gynecol. 2015; 212:229.

36. Lancaster A, Katherine J, Heather A et al. Risk factors for depressive symptoms during pregnancy: a systematic review. Am J Obstet Gynecol 2010 Jan;202(1):5-14.

37. Learman, L. A. (2018). Screening for Depression in Pregnancy and the Postpartum Period. Clin t Gynecol 2018; 61(3), 525-532.

38. Lilja G, Edhborg M, Nissen E. Depressive mood in women at childbirth predicts their mood and relationship with infant and partner during the first year postpartum. Scand J Caring Sci 2012; 26(2): 245–253.

39. . Lindahl V, Pearson J, & Colpe, L. Prevalence of suicidality during pregnancy and the postpartum. Arch Womens Ment Health, 8(2) 2005;77-87.

40. Kakyo T, Muliira J, Mbalinda, S et al. Factors associated with depressive symptoms among postpartum mothers in a rural district in Uganda. Midwifery. 2012;28(3), 374-379.

41. Khajehei M, Doherty M, Tilley P, et al. Prevalence and risk factors of sexual dysfunction in postpartum Australian women. J Sex Med 2015; 12(6): 1415–1426.

42. Kingi M, Muthoni M, Onesmus G et al. Depression during pregnancy and preterm delivery: a prospective cohort study among women attending antenatal clinic at Pumwani Maternity Hospital. Ann Gen Psychiatry. 2018;25;17:31.

43. Linnet O, Valentine W, Muthoni M et al. Demographic, psychosocial and clinical factors associated with postpartum depression in Kenyan women. BMC Psychiatry (2018) 18:318

44. Loredana C, Antonella G, Fiorino M et al. Prevalence of Maternal Postnatal Anxiety and Its Association With Demographic and Socioeconomic Factors: A Multicentre Study in Italy. Front Psychiatry. 2021; 12:

45. Nielsen D, Videbech P, Hedegaard M et al. Postpartum depression: identification of women at risk. BJOG Int J Obstet Gynaecol. 2000;107(10):1210–7.

46. Madeghe B, Kimani V, Vander et al. (2016). Postpartum Depression and infant feeding practices in a low-income urban settlement in Nairobi-Kenya. BMC Res Notes. 2016:9(1):506

47. Matthiesen A, Ransjö-Arvidson A, Nissen E. et al. Postpartum maternal oxytocin release by newborns: effects of infant hand massage and sucking. Birth. 2001;28(1):13–19.

48.48.

49. .Mathisen S, Glavin K, Lien L, et al. Prevalence and risk factors for postpartum depressive symptoms in Argentina: A cross-sectional study. Int J Womens Health. 2013; 5:787–793.

50. Ministry of Health. Kenya Demographic and Health Survey 2022. Pg 10

51. Moameri H, Ostadghaderi M, Khatooni, E, et al. Association of postpartum Depression and caesarean section: A systematic review and meta-analysis. Clinical Epidemiology and Global Health. 2019;7(3), 471-480.
52. Navarro P, García-Esteve L, Ascaso C Et al. Non-psychotic psychiatric disorders after childbirth: prevalence and comorbidity in a community sample. J Affect Disord, 2008;109(1-2), 171-176.
53. Marie P, Oluyinka A, Michaeala H.et al A cross-sectional study of the prevalence and factors associated with symptoms of perinatal depression and anxiety in Rwanda. BMC Pregnancy and Childbirth (2020) 20:68
54. Musau et. PREVALENCE OF POSTPARTUM DEPRESSION AMONG WOMEN DELIVERING AT KENYATTA NATIONAL HOSPITAL. Thesis. UON: 2013
55. Meltzer-Brody S. New insights into perinatal depression: pathogenesis and treatment during pregnancy and postpartum. Dialogues Clin Neurosci. 2011;13(1):89-100.
56. Miyake Y, Tanaka K, Sasaki S, et al. Employment, income, and education and risk of postpartum Depression: The Osaka Maternal and Child Health Study. J Affect Disord. 2011;130:133–7.
57. Molyneaux E, Poston L, Ashurst-Williams, S et al. Obesity and mental disorders during pregnancy and postpartum: a systematic review and meta-analysis. Obstet
58. Gynecol. 2010;123(4), 857-867.
59. Mutua, J. N. Prevalence of postpartum Depression and Anxiety among mothers of preterm infants receiving intensive care in newborn unit at Kenyatta National Hospital. (2017). University of Nairobi repository.

60. Okronipa HET, Marquis GS, Lartey A, et al. Postnatal depression symptoms are associated with increased diarrhea among infants of HIV-positive Ghanaian mothers. AIDS Behav 2012; 16(8): 2216–2225.

61. Ongeri L. Valentine W. Phelgona O. et al, Demographic, psychosocial and clinical factors associated with postpartum Depression in Kenyan women. BMC Psychiatry. 2018; 18(1):318.

62. Payne, J. , & Maguire, J. Pathophysiological mechanisms implicated in postpartum depression. Front Neuroendocrinol, 2019; 52: 165-180.

63. Saleh E-S, El-Bahei W, del El-Hadidy et al . Predictors of postpartum depression in a sample of Egyptian women. Neuropsychiatr Dis Treat. 2013;9:15.

64. Signe K. Gunnar T. Chudi B et al. Sleep and Depression in Postpartum Women: A Population-Based Study. Journal List. 2009; 32(7): 847–855

65. Silva R, Jansen K, Souza L et al. Sociodemographic risk factors of perinatal Depression: A cohort study in the public health care system. Rev Bras Psiquiatr. 2012;34:143–8.

66. Stewart D, Vigod S. Postpartum Depression: Pathophysiology, Treatment, and Emerging Therapeutics. Annu Rev Med. 2019:27;70:183-196.

67. Stuebe A, Grewen K, Pedersen C, et al. Failed lactation and perinatal depression: common problems with shared neuroendocrine mechanisms? Journal of Women's Health. 2012;21(3):264–272.

68. Tolossa, T. Fetensa, G., Yilma, M. et al. Postpartum depression and associated factors among postpartum women in Ethiopia: a systematic review and meta-analysis. 2020. 41:21

69. Ukpong D, Fatoye F, Oseni S, et al . Postpartum emotional distress in
70. mothers of preterm infants: a controlled study. East African Medical Journal. 200380(6), 289-292.
71. Vigod S, Villegas L, Dennis C, et al. Prevalence and risk factors for postpartum depression among women with preterm and low-birth-weight infants: a systematic
72. review. Bjog. 2010;117(5), 540-550
73. Villegas L, McKay K, Dennis C et al. Postpartum Depression among rural women from developed and developing countries: a systematic review. J Rural Health, 2010; 27(3), 278-288.
74. Virginia M. (2013) Prevalence of postpartum Depression among women delivering at Kenyatta National Hospital. University of Nairobi, Repository.
75. 6. Vliegen N, Casalin S, Luyten P, et al. Hospitalization-based treatment for postpartum depressed mothers and their babies: rationale, principles, and preliminary follow-up data. Psychiatry 2013; 76(2): 150–168.
76. Wubetu A, Engidaw N, & Gizachew K. Prevalence of postpartum Depression and associated factors among postnatal care attendees in Debre Berhan, Ethiopia. BMC Pregnancy Childbirth. 2020;20(1), 189.

APPENDICES

Appendix I: Work Plan

Activity	2022		2022	2022 -2023					
	June	July	Aug	Sept	Oct-Dec	Jan	Feb	Mar	April
Concept Formulation									
Proposal writing and presentation									
Proposal resubmission and ethical approval									
Actual data									

collection							
Data analysis							
Reportwriting and presentation							

Appendix II: Research Budget

Item	**Quantity**	**Rate**	**Amount**
Laptop	1	50,000	50,000
Flash disk	1	2,000	2,000
Pens	10	25	250
Printing of questionnaire and consent form	400	30	12, 000
Clip Boards	2	275	550
Biro pens	4	20	100
Data collection research assistants	4	20,000	80,000
Binding	4	100	400
Pilot Study		1	10,000
Airtime	1	3,500	3,500

IREC fees	1	10,000	10,000
Miscellaneous		10%	9,040
Total			**192,840**

Appendix III: Consent form

PARTICIPANT INFORMATION AND CONSENT

FORM FOR ENROLLMENT IN THE STUDY

Title of Study: Prevalence and risk factors of postpartum Depression and Anxiety among mothers with preterm newborns in Newborn Unit at Pumwani Maternity Hospital

Principal Investigator\and institutional affiliation: Peter Okari: University of Nairobi.

Introduction: I am Dr Peter Okari, a Masters in psychiatry student at the University of Nairobi. I am conducting a study on prevalence and risk factors of postpartum Depression and Anxiety among mothers with newborns in the Newborn Unit. The purpose of this consent form is to give you the information you will need to help you decide whether or not to be a participant in the study. Feel free to ask any questions about the purpose of the research, what happens if you participate in the study, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When I have answered all your questions to your satisfaction, you may decide to be in the study or not. This process is called 'informed consent'. Once you understand and agree to be in the study, I will request you to sign your name

on this form.

i) Your decision to participate is entirely voluntary.

ii) You may withdraw from the study at any time without necessarily giving a reason

for your withdrawal.

iii) Refusal to participate in the research will not affect you in any way. iv) I will give you a copy of this form for your records.

This study has approval by The Kenyatta National Hospital-University of Nairobi Ethics and

Research Committee protocol No _____

What is this study about?

This study seeks to evaluate postpartum depression among newborns mothers in nbu at pumwani maternity hospital. There will be approximately 217 participants in this study

purposively chosen. We are asking for your consent to consider participating in this study.

What will happen if you decide to be in this research study?

If you agree to participate in this study, the following things will happen:

You will be interviewed with a questionnaire by the researcher in Kiswahili.. The questionnaire will take approximately 30 minutes to complete. The questionnaire covers aspects of your

personal information, your mental health, and associated factors.

After completing the questionnaire, we will ask for a telephone number where we can contact you if necessary. If you agree to provide your contact information, it will be used only by people working for this study and will never be shared with others. The reasons why we may need to contact you include: to contact you in case we need further information, to share the study

findings and engage you in case of interventions.

Are there any risks, harms, discomforts associated with this study?

One potential risk of being in the study is loss of privacy. We will keep everything you tell us as confidential as possible. We will use a code number to identify you in a password-protected computer database and will keep all our paper records in a locked file cabinet. However, no system of protecting your confidentiality can be absolutely secure, so it is still possible that

someone could find out you were in this study and could find out information about you.

However, we will take all necessary measures as required to protect your identity.

Also, answering questions in the questionnaire may be uncomfortable for you. If there are any questions you do not want to answer, you can skip them. You have the right to refuse the

interview or any questions asked during the interview.

Are there any benefits being in this study?

There are no direct monetary benefits in participating in this study. However, the information you provide will help us better understand the prevalence of postpartum depression and associated factors among mothers with infants in the NBU hence informing policies and

interventions.

Will being in this study cost you anything?

The study participation will not cost you anything except the time (30 minutes) you will spend

on filling the questionnaire.

Will you get a refund for any money spent as part of this study?

You will not get any monetary compensation for your participation in this study. However, the study findings will be key in identifying PPD prevalence and possibly informing the need for interventions.

What if you have questions in future?

If you have further questions or concerns about participating in this study, please email, call or send a text message to the researcher on.

E-mail:peterokari@yahoo,com

Phone no: +254723705712

For more information about your rights as a research participant you may contact the Secretary/Chairperson, Kenyatta National Hospital-University of Nairobi Ethics and Research Committee Telephone No. 2726300 Ext. 44102 email uonknh_erc@uonbi.ac.ke.

What are your other choices?

Your decision to participate in research is voluntary. You are free to decline participation in the study and you can withdraw from the study at any time without injustice or loss of any benefits.

Consent form (statement of consent)

Participant's statement

I have read this consent form. I have had the chance to discuss this research study with the researcher. I have had my questions answered in a language that I understand. The risks and benefits have been explained to me. I understand that my participation in this study is voluntary and that I may choose to withdraw any time. I freely agree to participate in this research study. I understand that all efforts will be made to keep information regarding my personal identity

confidential.

By signing this consent form, I have not given up any of the legal rights that I have as a participant in a research study.

I agree to participate in this research study: Yes No

I agree to provide contact information for follow-up: Yes No

Participant printed name:

_____

Date _____

Participant signature

_____

Researcher's statement

I, the undersigned, have fully explained the relevant details of this research study to the participant named above and believe that the participant has understood and has willingly and

freely given his/her consent.

Researcher's Name: **Date**:

Signature

APPENDIX III-FAHARASA

Mada Kuu: Sababu za kuenea na hatari za unyogovu na wasiwasi baada ya kuzaa kati ya akina mama walio na watoto wachanga waliozaliwa kabla ya wakati katika kitengo cha watoto waliozaliwa katika Hospitali ya uzazi ya Pumwani.

Mtafiti Mkuu: Peter Okari: University of Nairobi.

Utangulizi

Mimi ni Dkt Peter Okari, mwanafunzi wa Shahada ya Uzamili ya magonjwa ya akili katika Chuo Kikuu cha Nairobi. Ninafanya utafiti kuhusu kuenea na sababu za hatari za unyogovu na wasiwasi baada ya kuzaa miongoni mwa akina mama walio na watoto wachanga katika Kitengo cha Waliozaliwa. Madhumuni ya fomu hii ya idhini ni kukupa taarifa utakayohitaji ili kukusaidia kuamua kama kuwa mshiriki au la katika utafiti huu. Jisikie huru kuuliza maswali yoyote kuhusu madhumuni ya utafiti, nini kitatokea ikiwa hutashiriki katika utafiti, hatari na manufaa yanayoweza kutokea, haki zako kama mtu wa kujitolea, na kitu kingine chochote kuhusu utafiti au fomu hii ambacho hakiko wazi. Wakati nimejibu maswali yako yote kwa kuridhika kwako, unaweza kuamua kuwa katika utafiti au la. Utaratibu huu unaitwa 'ridhaa ya taarifa'. Ukishaelewa na kukubali kuwa katika utafiti, nitakuomba utie sahihi jina lako kwenye fomu hii.

i) Uamuzi wako wa kushiriki ni wa hiari kabisa.

ii) Unaweza kujiondoa kwenye utafiti wakati wowote bila ya kutoa sababu kwa uondoaji wako.

iii) Kukataa kushiriki katika utafiti hakutakuathiri kwa vyovyote vile.

iv) Nitakupa nakala ya fomu hii kwa kumbukumbu zako.

Utafiti huu umeidhinishwa na Hospitali ya Kitaifa ya Kenyatta na Chuo Kikuu cha Maadili cha Nairobi na Itifaki ya Kamati ya Utafiti Nambari…….

Utafiti huu unahusu nini?

Utafiti huu unalenga kutathmini unyogovu wa baada ya kuzaa miongoni mwa akina mama wenye watoto wachanga katika hospitali ya uzazi ya pumwani. Kutakuwa na takriban washiriki 217 katika utafiti huu waliochaguliwa kimakusudi. Tunaomba idhini yako ili kuzingatia kushiriki katika utafiti huu.

Je, nini kitatokea ukiamua kushiriki katika utafiti huu?

Ukikubali kushiriki katika utafiti huu, mambo yafuatayo yatafanyika:

Utahojiwa na dodoso na mtafiti kwa Kiswahili.. Hojaji itachukua takriban dakika 30 kukamilika. Hojaji inashughulikia vipengele vyako habari za kibinafsi, afya yako ya akili, na mambo yanayohusiana.

Baada ya kujaza dodoso, tutauliza nambari ya simu ambapo tunaweza kuwasiliana nawe ikiwa ni lazima. Ukikubali kutoa maelezo yako ya mawasiliano, yatatumiwa na watu wanaofanya kazi katika utafiti huu pekee na kamwe hayatashirikiwa na wengine. Sababu ambazo tunaweza kuhitaji kuwasiliana nawe ni pamoja na: kuwasiliana nawe ikiwa tutahitaji maelezo Zaidi.

Je, kuna hatari yoyote, madhara, usumbufu unaohusishwa na utafiti huu?

Hatari moja inayoweza kutokea ya kuwa katika utafiti ni kupoteza faragha. Tutaweka kila kitu unachotuambia kwa siri iwezekanavyo. Tutatumia nambari ya msimbo kukutambua katika hifadhidata ya kompyuta iliyolindwa na nenosiri na tutaweka rekodi zetu zote za karatasi kwenye kabati ya faili iliyofungwa. Walakini, hakuna mfumo wa kulinda usiri wako unaweza kuwa salama kabisa, kwa hivyo bado inawezekana mtu anaweza kujua kuwa ulikuwa katika utafiti huu na kupata habari kukuhusu.

Hata hivyo, tutachukua hatua zote zinazohitajika ili kulinda utambulisho wako.

Pia, kujibu maswali kwenye dodoso kunaweza kukukosesha raha. Ikiwa kuna maswali yoyote ambayo hutaki kujibu, unaweza kuyaruka. Una haki ya kukataa

mahojiano au maswali yoyote yaliyoulizwa wakati wa mahojiano.

Je, kuna manufaa yoyote katika utafiti huu?

Hakuna faida za moja kwa moja za fedha katika kushiriki katika utafiti huu. Hata hivyo, maelezo utakayotoa yatatusaidia kuelewa zaidi kuenea kwa unyogovu baada ya kuzaa na mambo yanayohusiana kati ya akina mama walio na watoto wachanga katika kitengo cha watoto wachanga hivyo kuarifu sera na kuingilia kati.

Je, kuwa katika utafiti huu kutagharimu chochote?

Ushiriki wa utafiti hautakugharimu chochote isipokuwa muda (dakika 30) utakaotumia kwa kujaza dodoso.

Je, utarejeshewa pesa zozote zilizotumika kama sehemu ya utafiti huu?

Hutapata fidia yoyote ya fedha kwa ushiriki wako katika utafiti huu. Hata hivyo, matokeo ya utafiti yatakuwa muhimu katika kutambua kuenea kwa unyongofu kwa wamama waliojifungua na ikiwezekana kufahamisha hitaji la uingiliaji kati.

Je, ikiwa una maswali katika siku zijazo?

Ikiwa una maswali zaidi au wasiwasi kuhusu kushiriki katika utafiti huu, tafadhali tuma barua pepe, piga simu au tuma ujumbe mfupi wa maandishi kwa mtafiti.

Barua pepe:peterokari@yahoo,com

Namba ya simu: +254723705712

Kwa maelezo zaidi kuhusu haki zako kama mshiriki wa utafiti unaweza kuwasiliana na Katibu/Mwenyekiti, Hospitali ya Kitaifa ya Kenyatta-Kamati ya Maadili na Utafiti ya Chuo Kikuu cha Nairobi

Nambari: 2726300 Ext. 44102

Barua pepe: uonknh_erc@uonbi.ac.ke.

Chaguo zako zingine ni zipi?

Uamuzi wako wa kushiriki katika utafiti ni wa hiari. Uko huru kukataa kushiriki katika utafiti na unaweza kujiondoa kwenye utafiti wakati wowote bila dhuluma au hasara ya manufaa yoyote.

Fomu ya idhini (taarifa ya ridhaa)

Kauli ya mshiriki

Nimesoma fomu hii ya idhini. Nimepata nafasi ya kujadili utafiti huu na mtafiti. Nimejibiwa maswali yangu kwa lugha ninayoielewa. Hatari na faida zimeelezewa kwangu. Ninaelewa kuwa ushiriki wangu katika utafiti huu ni wa hiari na kwamba ninaweza kuchagua kujiondoa wakati wowote. Ninakubali kwa uhuru kushiriki katika utafiti huu. Ninaelewa kuwa juhudi zote zitafanywa ili kuweka maelezo kuhusu utambulisho wangu wa kibinafsi siri.

Kwa kutia saini fomu hii ya idhini, sijaacha haki zozote za kisheria nilizo nazo kama mshiriki katika utafiti.

Ninakubali kushiriki katika utafiti huu

Ninakubali kutoa maelezo ya mawasiliano kwa ufuatiliaji:

Sahihi ya mshiriki…….

Kauli ya mtafiti

Mimi, aliyetia sahihi hapa chini, nimeeleza kwa ukamilifu maelezo muhimu ya utafiti huu kwa mshiriki aliyetajwa hapo juu na ninaamini kuwa mshiriki ameelewa na kwa hiari yake akipewa ridhaa yake kwa uhuru.

Jina la

Mtafiti:……Tarehe:……

……..

Sahihi……..

Appendix IV: Questionnaire

Title PREVALENCE AND FACTORS ASSOCIATED WITH POSTPARTUM DEPRESSION AMONG MOTHERS IN NEWBORN UNIT AT PUMWANI MATERNITY HOSPITAL

You will asked questions in this section. You will be requested to freely give the answers as asked by the research.

For questions with boxes behind them tick as appropriate.

Section A: Sociodemographic Information What is your age? (Una umri gani?)……

When did you give birth? (Umejifungua lini?)……

What is the age of your newborn child? (Mtoto wako mchanga ana umri gani?)

…… -

What is your marital status? (Je, hali yako ya ndoa ikoje?)

a) Single (Mmoja)

b) Married (Umeolewa)

c) Separated/ Divorced (Kutengana/kutalikiwa)

d) Widowed (Mjane)

What is your religious affiliation? (Wewe ni dini gani?)

a) Christian (Mkristo)

b) Muslim (Muislamu)

c) Others, specify (nyingine, taja)_____

What is your highest level of education? (Kiwango chako cha juu cha elimu ni kipi?)

a) No formal education (Hakuna elimu rasmi)

b) Primary school (Shule ya msingi)

c) Secondary education (Elimu ya sekondari)

d) University/college (Chuo kikuu/chou)

e) Others, specify (Nyingine, taja)…….

What is your occupation? (Una kazi gani?)

a) Formal employment (Ajira rasmi)

b) Informal employment (Juakali sector) (Ajira zisizo rasmi (Sekta ya Juakali)

c) Farmer (Mkulima)

d) Housewife (Mama wa nyumbani)

e) Others, specify (Nyingine, taja)…….

Does your husband have another partner/wife? (Je, mumeo ana mpenzi/mke mwingine?)

a) Yes (ndio)

b) No (la)

Section B: Risk factors: Sehemu B: Sababu za hatari

Did you have any disease /complications at the time of pregnancy? (Je, ulikuwa na ugonjwa/matatizo yoyote wakati wa ujauzito?)

Yes (Ndio)

No (La)

Did you experience any complications during birth? (Je, ulipata matatizo yoyote wakati wa kuzaliwa?)

Yes (Ndio)

No

Do you have diabetes? (Je, una kisukari?)

a) Yes(Ndio)

b) No(La)

c) Don't know. (Haujui)

Has your husband ever beaten you? (Je, mumeo amewahi kukupiga?)

a) Yes(Ndio)

b) No (La)

If yes, when did this last happen? (Ikiwa ndio, hii ilifanyika mara ya mwisho lini?)

_____

What was the form of birth of the child? (Je! Ulijifungua mtoto kwa njia gani?)

a) Caesarean section (Njia ya operation)

b) Normal vaginal birth (Kuzaliwa kwa kawaida kwa uke)

What was the gestation period at birth? (Indicate in weeks) (Je! ni kipindi gani cha ujauzito wakati wa kuzaliwa? (Onyesha katika wiki))

Did the child have any complications at birth? (Je, mtoto alikuwa na matatizo yoyote wakati wa kuzaliwa?)

a) Yes (Ndio)

b) No (La)

APPENDIX VA: Edinburgh Postnatal Depression Scale (EPDS)and Beck's Anxiety Scale

Instructions

- Since you are either pregnant or have recently had a baby, we want to know how you feel.
- Please place a CHECK MARK () on the blank by the answer that comes closest to how you have felt IN THE PAST 7 DAYS—*not just how you feel today.*
- Complete all 10 items and find your score by adding each number that appears in parentheses (#) by your checked answer.
- This is a screening test; not a medical diagnosis.

- If something doesn't seem right, *call your healthcare provider regardless of your score*.

Edinburgh Postnatal Depression Scale[1] (EPDS)

Postpartum depression is the most common complication of childbearing.[2] The 10-question Edinburgh Postnatal Depression Scale (EPDS) is a valuable and efficient way of identifying patients at risk for "perinatal" depression. The EPDS is easy to administer and has proven to be an effective screening tool.

Mothers who score above 13 are likely to be suffering from a depressive illness of varying severity. The EPDS score should not override clinical judgment. A careful clinical assessment should be carried out to confirm the diagnosis. The scale indicates how the mother has felt ***during the previous week***. In doubtful cases it may be useful to repeat the tool after 2 weeks. The scale will not detect mothers with anxiety neuroses, phobias or personality disorders.

Women with postpartum depression need not feel alone. They may find useful information on the web sites of the National Women's Health Information Center <www.4women.gov> and from groups such as Postpartum Support International <www.chss.iup.edu/postpartum> and Depression after Delivery <www.depressionafterdelivery.com>.

SCORING

QUESTIONS 1, 2, & 4 (without an *)
Are scored 0, 1, 2 or 3 with top box scored as 0 and the bottom box scored as 3.

QUESTIONS 3, 5-10 (marked with an *)
Are reverse scored, with the top box scored as a 3 and the bottom box scored as 0.

Maximum score: 30
Possible Depression: 10 or greater
Always look at item 10 (suicidal thoughts)

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Instructions for using the Edinburgh Postnatal Depression Scale:

1. The mother is asked to check the response that comes closest to how she has been feeling in the previous 7 days.
2. All the items must be completed.
3. Care should be taken to avoid the possibility of the mother discussing her answers with others. (Answers come from the mother or pregnant woman.)
4. The mother should complete the scale herself, unless she has limited English or has difficulty with reading.

[1]Source: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 150:782-786.

[2]Source: K. L. Wisner, B. L. Parry, C. M. Piontek, Postpartum Depression N Engl J Med vol. 347, No 3, July 18, 2002, 194-199

Edinburgh Postnatal Depression Scale[1] (EPDS)

Name:_____. Address:_____.

Your Date of Birth: _____ _____

Baby's Date of Birth:_____ Phone: _____.

As you are pregnant or have recently had a baby, we would like to know how you are feeling. Please check the answer that comes closest to how you have felt IN **THE PAST** 7 **DAYS,** not Just how you feel today.

Here is an example, already completed.

I have felt happy.

□ Yes all the time.

□ Yes, most of the time: This would mean; "I have felt happy most of the time during the past week.

□ No, not very often Please complete the other questions m the same way.

□ No, not at all

In the past 7 days:

1. 1 have been able to laugh and see the funny side things

□ As much as 1 always could

□ No quite so much now

□ Definitely not so much now

□ Not at all

2. I have looked forward with enjoyment to things

□ As much as I ever did

□ Rather less than I used to .

□ Definitely less than I used to.

□ Hardly at all.

3. I have blamed myself unnecessarily when things went wrong.

□ Yes, most of the time.

□ Yes, some of the time.

□ Not very often.

□ No never.

4. I have been anxious or worried for no good reason.

□ No, not at all.

□ Hardly ever.

□ Yes sometimes.

□ Yes, very often.

5. I have felt scared or Panicky for no very good reason.

□ Yes, quite a lot.

□ Yes sometimes

□ No, not much.

□ No, not at all.

6. Things have been getting on top of me.

□ Yes, most of the time, I haven't been able to cope at all.

□ Yes, sometimes I haven't been able copying as well as usual.

□No most of the time I have coped quite well.

□ No, I have been copying as well as ever.

7. I have been so unhappy that I have difficulty sleeping.

□ Yes, most of the time.

□ Yes, sometimes.

□ Not very often.

□ No, not at all.

8. I have felt sad or miserable.

□ yes, most of the time.

□ Yes, sometimes.

□ Not very often.

□ No, not at all.

9. I have been so unhappy that I have been crying.

□ Yes, most of the time.

□ Yes, quite often.

□ Only Occasionally.

□ No, never.

10. The thought of harming myself has occurred to me.

□ Yes, quite often.

□ Sometimes.

□ Hardly ever.

□ Never.

Administered by_____. Date_____.

1. Source: Cox IL, Holden, J.hl, and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10 item Edinburgh Postnatal Depression Scale. British journal of Psychiatry 150;782 – 786.

Source: K. L Wisner, B. L Parry.C M. Pionrek, Postpatum Depression N Eng l J Med vol. 347, July 18. 2002. I94-199

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APPENDIX V(B): Edinburgh Postnatal Depression Scale (EPDS) in Swahili.

Swahili version of epds by (Kumar,Ongeri,Maathai,Mbwayo)[32]

	EPDS items	**Final translation into Kiswahili**
1	I have been able to laugh and see the funny side of	Nimeweza kucheka na kuona jambo la
2	I have looked forward with enjoyment to things	Nimetarajia mambo kwa furaha
3	I have blamed myself unnecessarily when things went	Nimejilaumu bila sababu wakati mambo
4	I have been anxious or worried for no good reason	Nimekuwa na wasiwasi bila sababu nzuri
5	I have felt scared or panicky for no very good reason	Nimeshikwa na woga au hofu bila sababu
6	Things have been getting on top of me	Mambo yamekuwa yakinilemea
7	I have been so unhappy that I have had difficulty	Nimekuwa na huzuni sana hadi nimekuwa
8	I have felt sad or miserable	Nimesikia huzuni sana na kutokua na furaha
9	I have been so unhappy that I have been crying	Sijakuwa na furaha kabisa hadi nimetokwa
10	The thought of harming myself has occurred to me	Nimekuwa na mawazo ya kujitendea

Appendix VIA: Beck Anxiety Inventory in English

Beck Anxiety Inventory

	Not At All	Mildly but it didn't bother me much.	Moderately - it wasn't pleasant at times	Severely – it bothered me a lot
Numbness or tingling	0	1	2	3
Feeling hot	0	1	2	3
Wobbliness in legs	0	1	2	3
Unable to relax	0	1	2	3
Fear of worst happening	0	1	2	3
Dizzy or lightheaded	0	1	2	3
Heart pounding/racing	0	1	2	3
Unsteady	0	1	2	3
Terrified or afraid	0	1	2	3
Nervous	0	1	2	3
Feeling of choking	0	1	2	3
Hands trembling	0	1	2	3
Shaky / unsteady	0	1	2	3
Fear of losing control	0	1	2	3
Difficulty in breathing	0	1	2	3
Fear of dying	0	1	2	3
Scared	0	1	2	3
Indigestion	0	1	2	3
Faint / lightheaded	0	1	2	3
Face flushed	0	1	2	3
Hot/cold sweats	0	1	2	3
Column Sum				

Scoring **-** Sum each column. Then sum the column totals to achieve a grand score. Write that score here _____ .

Appendix VIB Beck Anxiety Inventory in Swahili

	Hapana	Kidogo lakini haikunisumbua	Kwa wastani - haikuwa ya kupendeza	Sana - ilinisumbua
Kufa ganzi au kuwashwa	0	1	2	3
Kuhisi joto	0	1	2	3
Kutetemeka kwa miguu	0	1	2	3
Kukosa Kupumuzika	0	1	2	3
Hofu ya kutokea Jambo mbaya zaidi	0	1	2	3
Kusikia Kizunguzungu				
Moyo kupiga sana ama kuenda mbio	0	1	2	3
Kutotulia	0	1	2	3
Kuwa na hofu	0	1	2	3
kufadhaika kwa urahisi au kushtushwa.	0	1	2	3
Kuhisi Kunyongwa	0	1	2	3
Kutetemeka kwa mikono	0	1	2	3
Kutokuwa imara	0	1	2	3
Hofu ya kupoteza udhibiti	0	1	2	3
Kuwa na ugumu wa kupumua.	0	1	2	3
Kuwa na hofu ya kufa	0	1	2	3
Kuogopa	0	1	2	3
Kuwa na shida ya juskikia imejaa.tumbo	0	1	2	3
Kuhisi kuzimia	0	1	2	3
Uso ulio na joto.	0	1	2	3
Jasho moto au baridi	0	1	2	3
Jumuhisho la safu	0	1	2	3

Kupata alama Zote:

Jumlisha kila safu. Kisha fanya jumla ya safu wima ili kupata alama kuu. Andika alama hiyo hapa.