BREASTFEEDING PRACTICES AND INFANT NUTRITION STATUS (6-23 WEEKS) OF POST-PARTUM DEPRESSED MOTHERS IN MAMA LUCY KIBAKI AND MBAGATHI HOSPITALS IN NAIROBI CITY COUNTY

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REG NO: H60/CTY/PT/38158/2017

THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE IN MASTERS OF SCIENCE (FOOD, NUTRITION AND DIETETICS) IN THE SCHOOL OF HEALTH SCIENCES OF KENYATTA UNIVERSITY

JULY, 2024

DECLARATION

This thesis is my original work and has not been presented for the award of a degree in Kenyatta University or any other University.

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DEDICATION

This thesis is dedicated to my entire family for their moral support and understanding during my entire post-graduate period.

ACKNOWLEDGEMENTS

My gratitude goes to my supervisors Dr. Peter Chege and Dr. Winfreda Nyamota for their patience and continuous guidance throughout this study. The fruition of this study is due to your support.

My special gratitude goes to my parents Mr. and Mrs. Amoke for both their financial and moral support. Your constant support has enabled me to push through up to the end. I also extend my appreciation to all study participants for their cooperation in the study.

Finally, I would like to Mr.Tobias Pinkes for your unwavering support throughout the study that gave me the zeal to push on to the very end.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

C I	Confidence Interval
EBF	Exclusive breastfeeding
EPDS	Edinburgh Postpartum Depression Scale
ESPGHAN	European Society for Paediatric, Gastrology, Hepatology and Nutrition
HAZ	Height for Age Z score
IYCN	Infant and Young Child Nutrition
KDHS	Kenya Demographic Health Survey
KHSSP	Kenya Health Sector Strategic and Investment Plan
Ksh	Kenyan Shillings
KUERC	Kenyatta University Ethics and Research Committee
MAM	Moderate acute malnutrition
MCH	Mather-Child-Clinic
ORS	Oral Rehydration Salt
PPD	Post-partum depression
S D	Standard Deviation
S.V	Sexual Violence
SAM	Severe acute malnutrition
SPSS	Statistical Packages for Social Sciences
UNICEF.	United Nations International Children's Emergency Fund
WAZ	Weight for Age Z score
WHO	World Health Organization
WLZ	Weight for Length Z score

OPERATIONAL DEFINITION OF TERMS

Postpartum depression- Non-psychotic episode of depression occurring between 6-23 weeks post-partum and mothers' with EPDS score of 13 and above

Social Apathy- Refers to the feeling of whether the mothers' family and partner show interest, concern or empathy towards the mother. The mother needs to feel if the concern, empathy and interest is enough or not

Breastfeeding- Feeding of infants with milk from their mother's breast

Breastfeeding practice- Feeding infants exclusively with breast milk only for the first six months of life and initiating breastfeeding within the first hour after birth.

Anthropometry- The study and technique of taking body measurements, especially for use on a comparison or classification basis. Basically, the measurement of the human individual for the purposes of understanding human physical variation.

Nutrition status- Refers to the anthropometric status of infants. It was measured by length and weight to determine wasting, stunting, underweight and overweight.

Z score or standard deviation- The deviation of anthropometric value(s) for an individual child from the median value of the reference population.

Physical Violence- An act of harming an individual through physical means. It includes slapping, kicking, chocking, strangling beating and shoving.

Sexual Violence- Sexual activity that occurs without consent and it may include one that occurs due to bullying, threats, deception, force and intimidation.

Edinburgh Postnatal Depression Scale– It is a "standardized self-reported "questionnaire that is used for screening women with postpartum depression, (see appendix B)

ABSTRACT

Postpartum depression is a non-psychotic of depression that affects many mothers and particularly it affects their breastfeeding practices. Mothers with this mental condition have been reported to have poor breastfeeding habits and their infants have high under nutrition rates. Exclusive breastfeeding is associated with reduced diarrhea rates and respiratory infections. Due to the increased rate of under nutrition in the country and its association with breastfeeding practices among children under 5 years of age, it is of importance to know if these rates are contributed by women suffering from postpartum depression (PPD). This study, determined the nutrition status of infants 6-23 weeks of age born of mothers with PPD, infant breastfeeding practices of mothers with PPD, socio-demographic factors of households of mothers with PPD. Finally, the study evaluated association between PPD, breastfeeding practices and nutrition status of the infants and socio-demographic factors of households of postpartum depressed mothers. The study design was cross-sectional and conducted in Nairobi City County and particularly in Mbagathi hospital and Mama Lucy Kibaki hospital MCH clinics. A sample size of 202 mothers was used. Proportionate distribution was employed in determining the number of participants per hospital while consecutive sampling was used to select the respondents. A researcher-administered questionnaire was used to collect data on breastfeeding practices, nutrition status, maternal socio-economic factors as well as their behavior and characteristics. Height board and a weighing scale were used to collect data on the nutrition status of the infants with the help of 2 trained research assistants. The data collection period was from June to November 2021. Data was cleaned and coded before entry into SPSS. The nutrition status was analyzed using ENA for SMART. Chi-square test was used to determine the association between breastfeeding practices and nutrition status of the infants. Pearson correlations and logistical regression were used to investigate the relationship between nutrition status, breastfeeding practices, and socio-demographic characteristics. More than half of the mothers (59.6%) were between the age of 20-29 and 86.8% had at least secondary education. The level of income among 73.1% of the respondents was below Ksh. 20000 with the husband being the sole provider. Almost half of the mothers felt like social empathy from family was not enough. The rate of exclusive breastfeeding was 76.3% while 83.2% of the mothers initiated breastfeeding within the first hour after delivery Prevalence of underweight, stunting, wasting and overweight were 21.1%, 20.0%, 14.2% and 3.2% respectively.. The study found no significant association between breastfeeding practices and nutrition status of the infants chi-square $p = < 0.01$ for length for weight, $p = 0.157$ for weight for age and $p = 0.125$ for height for age. Exclusive breastfeeding practice had a strong negative correlation with the age of the infant $r = -.341$, $p < 0.01$. Conclusively, the wasting, stunting and underweight rates were higher than the national rates. The study recommends the intervention to include screening of postpartum depression in the post-natal and child welfare clinics.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Childbirth is the most exciting period for a lot of mothers but to some, it is a time filled with emotional distress and lack of self-care (Post & Leuner, 2019). This is because of the adverse hormonal changes that eventually lead to changes in mood (Upadhyay et al., 2017). WHO refers to health as a state of complete physical, mental and social well-being and not just by the absence of illness. With this in mind, it is clear that a mother's mental health is important, especially after childbirth. The emotional disturbances and changes during the post-partum period range from mild post-partum blues to severe cases which is post-partum psychosis.

Post-partum blues refers to a feeling of worry, tiredness and fatigue associated with having a newborn baby (Bobo & Yawn, 2014). This post-partum phase is common to many mothers because infants require undivided attention which might lead to increased sleep deprivation and general body exhaustion. The above symptoms disappear after a few days or weeks but most of the time it lasts less than six weeks post-partum (Fiala et al., 2017) and it does not pose any harm to the mother. The only care that the mother requires at this time is assurance and help from other family members.

Postpartum depression is a major depressive episode without psychotic features, linked to childbirth. It involves an episode of major or minor depressive disorder that emerges during the postpartum period. (O'Hara & McCabe, 2013). Characteristics include severe sadness or emptiness, loss of interest in hobbies and normal activities, withdrawal from friends,

emotional numbness, constant fatigue, intense concern and worry about the baby or total lack of interest in the baby (Pendergast et al., 2014). Most of the time this condition usually goes unnoticed because it is underdiagnosed and undertreated. This is a major concern because many mothers might not know that they suffer from the it thus calling for early and regular screening especially at the MCH clinic (van der Zee-van den Berg et al., 2017). Post-partum depression (PPD) requires medical intervention although at times psychosocial support is all that is required (Anokye et al., 2018). Studies have also shown that mothers with postpartum depression usually have reduced confidence in their ability to breastfeed and as such, they may not practice exclusive breastfeeding. If the condition becomes worse and is not treated, an individual might develop post-partum psychosis.

Post-partum psychosis is a serious but rare psychotic mood disorder whose symptoms include mania, hallucination, paranoia, insomnia, delusions, confusion, irritability and restlessness among others (Bergink et al., 2016). A mother with post-partum psychosis requires immediate medical assistance because she is at an increased risk of harming herself, the baby or both (Johannsen et al., 2016).

The World Health Organization (WHO) and the United Nations International Children's Emergency Fund (UNICEF) recommend that an infant should be breastfed exclusively for the first six months of life and initiate breastfeeding within first one hour after birth (WHO/UNICEF, 2021). Breast milk has the largest impact in reducing infant mortality as opposed to other preventive measures by providing irreplaceable essential nutrients that promotes healthy growth and development. Breast milk also serves as the first infant

immunization and it protects against respiratory infection, diarrheal diseases as well as having protective effects against obesity and other non-communicable diseases later on in life (Bernado, 2013; Horta et al., 2015).

Globally, the overall rate of exclusive breastfeeding for children under six months of age is 41% (*global-bf-scorecard-2017*). Eastern and Southern Africa have rates of 56% while in the rest of Africa UNICEF region, the rate of exclusive breastfeeding is 33% (UNICEF, 2018). In Kenya, the exclusive breastfeeding rate is at 60% (KDHS, 2022) and though this is high as compared to many other African countries, it falls short of the WHO recommended target of 90%. WHO recommends breastfeeding to be initiated within the first hour after birth. The Kenya Demographic Health Survey shows that 63% of children in rural areas were put to the breast within 1 hour of birth while 55% of children in urban areas were put on breast within one hour after birth (KDHS, 2022). To be precise, the rate of breastfeeding initiation within the first hour after birth stands at 52.6%.

Malnutrition remains one of the leading causes of death and morbidity among children under the age of five years in developing countries. The global stunting rate is 21.9% while in Africa it is 33%. Global wasting rates are 7.3% while in Africa it is 4.2%. Global overweight rates are 5.9% while in Africa 4.2% (UNICEF, 2019). The rate of stunting, wasting and overweight in Nairobi County stands at 11%, 2.6% and 6% respectively (KDHS, 2022).

Globally 13% of women experience mental disorders primarily depression after giving birth and19.8% of women in developing countries experience post-partum depression

(WHO, 2018). A meta-analysis on the prevalence rate of postpartum depression in Africa found it to be between 16%-22.5% (Gelaye, Rondon, Araya & Williams, 2016). In a study done in Kenya, the prevalence rate of post-partum depression was 13.0%.

1.2 Statement of the problem

Mental wellbeing of a mother is important for her overall health and that of the infant. Maternal depression, in particular, has been proven to impact negatively on the health and development of infants. The infants are undernourished and have higher rates of diarrhea as compared to infants whose mothers do not have depression. Studies have also proven that exclusive breastfeeding for the first six months of a child's life and initiation of breastfeeding within first hour after birth is associated with an improved child's immune system. This, therefore, leads to decreased diarrhea episodes and respiratory infections which are the major causes of infant death particularly in developing countries.

Post-partum depression poses risks to the mother. The risks include lack of self-care, lack of sleep, suicidal thoughts and in extreme cases suicide. The risks to the infant include poor infant growth (Holm-Larsen et al., 2019), poor cognitive development and increased under nutrition, both stunting and underweight (Kathree et al., 2014).

A mother with postpartum depression may not take care of herself or her baby due to the emotional and hormonal changes associated with childbirth and this can lead to poor infant feeding habits (Zubaran & Foresti, 2013).Not taking care of the baby properly may include not breastfeeding exclusively, not initiating breastfeeding within one hour after birth and early weaning which may lead to infections and diarrheal diseases. Infections and diarrheal

diseases on their own may lead to under nutrition or may lead to reduced breast milk intake which can lead under nutrition. The breastfeeding frequency and duration may also be limited when a mother has PPD and this may lead to the baby not getting the hind milk which is nutrient dense and thus being undernourished.

PPD can negatively impact the health of the mother and her family at large. In severe cases, it can lead to suicide, infanticide or both thereby increasing the mortality rates of both infant and mother (Johannsen et al., 2016). DHIS data indicates that less than 1% of new patients are diagnosed with a mental disorder in the outpatient clinic as opposed to the target of 3% (Kenya Health Strategic Plan, 2016). This is due to little or lack of proper diagnosis of mental issues in the outpatient clinic. Reduction of maternal mortality rates has focused majorly on the physical well-being of the mother and the baby but little emphasis has been put on the emotional and psychological wellbeing of the mother. For this reason, PPD goes undetected and thus remains untreated.

1.3 Justification of the study

The major cause of death among infants is inadequate breastfeeding coupled with disease and it is estimated that 11.6% of deaths among children under five years of age is attributed to suboptimal breastfeeding (Hajeebhoy et al., 2014). Post-partum depression is only recognized when the behavior of a mother is grossly abnormal even though this can be screened and diagnosed early enough to ensure both the mother and the child receive proper care. Many studies have been done on exclusive breastfeeding, post-natal care for women and the factors associated with non-exclusive breastfeeding but very few, have been done

to determine the breastfeeding practices and nutrition status of infants of mothers with postpartum depression. Therefore, by carrying out this study then I have shed light on the breastfeeding practices and nutrition status of infants whose mothers have this mental problem. This can prompt early screening of mothers with the condition so they can receive proper care on time.

1.4 Purpose of the Study

The purpose of this study is to establish the situation and association between breastfeeding practices and the nutrition status of infants 6-23 weeks of age of post-partum depressed mothers.

1.5 Objectives of the study

1.5.1 Broad objectives

To determine the breastfeeding patterns and nutrition status of infants of postpartum depressed mothers.

1.5.2 Specific objectives

1. To establish the socio-demographic factors of households of postpartum depressed mothers in Mama Lucy Kibaki and Mbagathi hospitals in Nairobi City County.
2. To establish the breastfeeding practices of post-partum depressed mothers in Mama Lucy Kibaki and Mbagathi hospitals in Nairobi City County.

3. To determine the nutrition status of infants 6-23 weeks of age born to mothers experiencing PPD in Mama Lucy Kibaki and Mbagathi hospitals in Nairobi City County.
4. To evaluate the association between breastfeeding practices, nutritional status of the infants and socio-demographic factors of households of postpartum depressed mothers.

1.6 Hypotheses of the study

H_{01}: There is no association between post-partum depression and breastfeeding practices of infants 6-23 weeks.

H_{02}: There is no association between post-partum depression and the nutrition status of infants 6-23 weeks.

H_{03}: There is no association between breastfeeding practices and the nutrition status of infants 6-23 weeks.

1.7 Significance of the study

The findings in this study is useful firstly, in aiding policy makers when making policies and designing interventions that are be geared towards achieving optimum infant and young child feeding practices to reduce infant mortality rates. Secondly, the findings are useful in designing and improving strategies useful in achieving the National Nutrition Action Plan 2012-2017 which aims at improving the nutrition status of children and maternal health by 2030. Thirdly, the study findings is useful in the optimization of strategies geared towards enforcement of proper maternal mental health as they have a

ripple effect on infants and the family at large. Finally, the study adds to the body of knowledge on post-partum depression and its risks to the nutrition status of infants under the age of 6 months.

1.8 Limitation of the study

This research was conducted in a hospital setting and as such, it did not include those individuals who decide not to seek help from medical practitioners in the hospital.

1.9 Delimitation of the study

The study was conducted in Mama Lucy Kibaki and Mbagathi hospitals in Nairobi City County and mothers with post-partum depression and their children attending MCH clinics in the two public hospitals were chosen therefore the results can only be generalized to areas and hospitals with similar characteristics.

1.10 Assumption of the study

The study assumed the respondents provided honest information

1.11 Conceptual framework

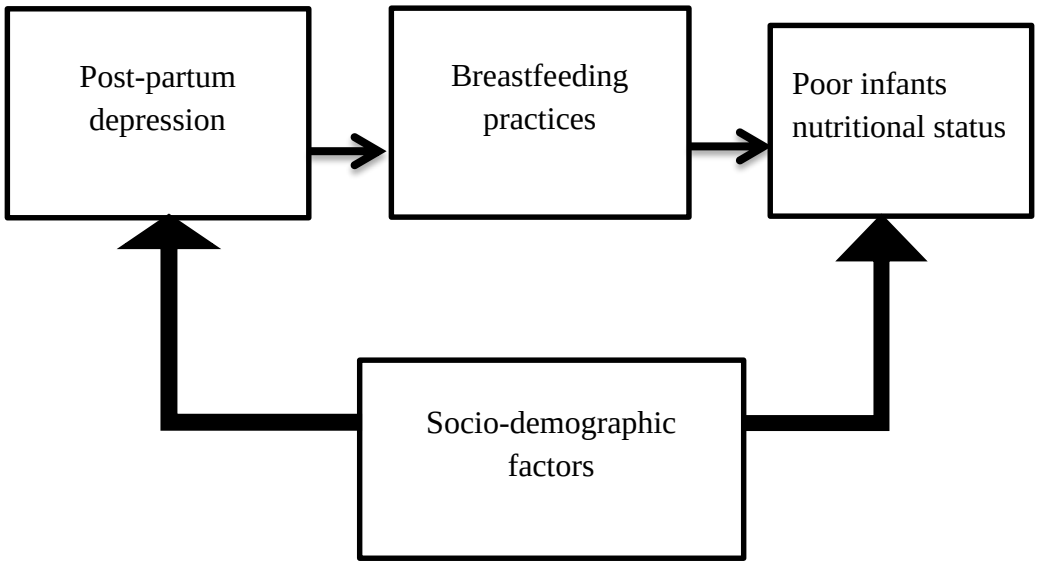


Figure 1.1 Conceptual framework on factors associated with PPD and how it affects infants' nutrition status.

Adapted and modified from the WHO conceptual framework on social determinants of health (WHO, 2010).

The conceptual framework provides a framework that shows the different ways that can lead to the development of PPD and thus affect infant nutrition status. First of all, socio-demographic factors which include but are not limited to age, level of education and marital status alone can lead to the development of post-partum depression and also these factors on their own can lead to poor infant nutrition status.

Once a mother has post-partum depression she may not practice exclusive breastfeeding or wean the infant off breast milk early on. The mothers breastfeeding frequency and duration may be limited which may lead to inadequate breast milk intake The above poor breastfeeding practices can lead to .and this can lead to infants' poor nutrition status which can be determined by nutritional anthropometrical measurements.

CHAPTER TWO: LITERATURE REVIEW

2.1 Postpartum depression

Many women experience a wide range of emotions during pregnancy and postpartum period that makes them vulnerable to psychiatric disorders. The emotion range from anticipation, excitement, happiness, fulfillment, anxiety, frustrations and confusion. Postpartum depression is a common psychiatric condition that is associated with childbirth (O'Hara & McCabe, 2017). According to DSM-IV the symptoms of postpartum depression begins four weeks after the child is born and can last up to one year. Postpartum depression symptoms include anxiety depressed mood, sleep disturbance, loss of energy, confusion, anxiety, guilt feeling as well as suicidal thoughts (santé et al., 1992). Postpartum depression can have profound effects on both the mother and the child (Farías-Antúnez et al., 2018a; Horta et al., 2015).

Prevalence of postpartum depression defers from country to country, region to region, race to race and among women of the same cultural background. According to a study done in two public hospitals in Kenya, the prevalence rate for postpartum depression was 18.7% (Ongeri et al., 2018a). A review of 124 articles that entailed research done on postpartum depression prevalence in more than 50 countries across different cultures found it to be between 4-63.9% with Japan and America reporting the lowest and highest rates respectively (Roshaidai Mohd Arifin et al., 2018). These rates are so high as opposed to the estimated rate of 10-15% recorded. This clearly shows how significant the condition is and how it is underreported (Wang et al., 2021). Studies have showed how wealth inequality, difference in employment patterns and maternal and child health indexes in

different countries have led to the differences in the prevalence rate in PPD(Hahn-Holbrook et al., 2018).In Kenya, screening of PPD is a challenge due to lack of screening tools in most health facilities especially public health facilities. Moreover, screening programs are recommended where there is a follow-up intervention (Ongeri et al., 2018a). The research recommends regular screening in order to identify mothers during the clinic visits in healthcare facilities. This study screened and referred the study participants to receive care from mental health specialist in the hospital.

2.2 Breastfeeding Practices among infants 6-23 weeks

According to WHO, exclusive breastfeeding refers to feeding a child below six months with breast milk only, be it directly from the breast or expressed, with no addition of any liquid or solids apart from drops or syrups consisting of vitamins, mineral supplements or medicine and nothing else. The breastfeeding initiation should also be within one hour after birth (WHO/UNICEF, 2018). Exclusive breastfeeding has been proven to have positive health benefits for the baby (WHO, 2018) including improved immunity. Proper initiation of breast milk within the first hour after birth has been shown to reduce depressive symptoms on the mother and foster positive attachment and bonding between the mother and the child (Victora et al., 2016a).

According to a pooled analysis of population based survey in Ghana from 2003-2017, it was found that 60% of children 0-3 months were exclusively breastfed while less than 40% of those between 4-5 months breastfeeding pattern included addition of water and puree. Breastfeeding initiation within the first hour after birth stood at 53% (Mohammed et al.,

2022) . Another study in Nepal found that out of the 574 children in the study, 23.2% were exclusively breastfed for 23 weeks, 28.2% were predominantly breastfed and 48.6% were partially breastfed for 23 weeks.

A paper by the European Society for Peadiatrics and Gastroenterology, Hepatology and Nutrition (ESPGHAN) Committee recommended that infants should be exclusively breastfed for not less than 17 weeks. The committee also agreed that it is common for mothers to use formula milk until the baby attained the age of 23 weeks (Fewtrell et al., 2017). Another study done in Northern Italy to determine whether parents comply to the WHO recommendation on Infant and Young Child Nutrition, found that 86% of the mothers introduced food to the baby before the age of 23 weeks (Carletti et al., 2017). This might be because they follow the ESPGHAN recommendations of exclusive breastfeeding for only 17 weeks.

The benefits of exclusive breastfeeding are undebatable (Ho et al., 2018) but sometimes due to specific circumstances, the mother of the baby may not be able to breastfeed directly. This may lead to expressing the breast milk because it's the only way the baby can have human milk and to practice exclusive breastfeeding for the first six months of the baby's life. Expressing simply means that the baby gets access to human milk without suckling the breast. The milk can be obtained either by hand or manual pump and electric pump (*Expressing and Storing Breast Milk*, 2020). Mothers who decide to give breast milk to the baby regardless of the circumstance usually need support from the family in order to continue to do the same (McFadden et al., 2017).

Kenya has shown significant improvements in exclusive breastfeeding rates from 32% in 2008 to 60% in 2022.The rate of breastfeeding initiation within the first hour stands at 63% and 55% respectively in both rural and urban centers in Kenya (KDHS,2022). Despite improvements made on increasing EBF rates, cross-sectional studies conducted based on 24-hour recall, reveal that infants sometimes intermittently receive other liquid foods before switching back to breast milk (Patil et al., 2015). This study is in line with an observational longitudinal study conducted in rural Kenya by Talbert et al., (2020)who reported that out of the 20 mothers who participated in the study, only 2 breastfed their children up to 6 months. Pre-lacteal feeds, home remedies, and traditional medicines were given to the children within their first week of life (Talbert et al., 2020). Concern over baby bowels and persistent crying which was perceived, as abdominal colic or breast milk not being enough for the baby are some of the factors that led to the mothers to give these traditional remedies at an early age. The above concerns are magnified when a mother has postpartum depression and as such the study looked at the breastfeeding patterns of these mothers.

2.3 Assessment of Nutrition Status of infants aged 6-23 weeks

Nutrition assessment refers to the interpretation of anthropometric, biochemical, clinical and dietary data to determine whether an individual is well nourished or malnourished (Dao et al., 2019). Nutrition status is the balance between nutrient intake and utilization of the said nutrients to facilitate growth, development and health maintenance (Adegun et al., 2015).

The current diagnosis criterion for assessment of nutrition status uses weight for length z-scores even though the 2006 WHO standards exclude infants below 45cm (WHO, 2009). A study aimed at describing the criteria for screening of undernourished infants below six months of age using simple index measures, found that Weight For Age Z-score (WAZ) was a valuable screening criteria followed by Mid-Upper Arm Circumference(MUAC) then weight-for-length Z-score (WLZ). MUAC has been tested and it is used predominantly on children between 6-59 months. Currently there is no globally established MUAC threshold to identify infants below 6 months who are at risk of malnutrition (Rana et al., 2021) although there are various evidence in studies conducted in Africa to suggest effectiveness of using MUAC.

A systematic review to determine the anthropometric criteria for identifying infants under the age of six months who are at risk of morbidity and mortality found that WLZ had both poor reliability and prognosis while MUAC and WAZ were better at identifying infants at risk of morbidity and death (Hoehn et al., 2021). A similar study conducted in Gambia also found that unadjusted MUAC was better in identifying infants between 6-14 weeks of age who are at risk of mortality (Mwangome et al., 2012).

Another study conducted in Pakistan to compare MUAC and WLZ as an indicator for Severe Acute Malnutrition for infants below six months of age found that MUAC of 10.5cm can be used as an indicator with acceptable validity for diagnosing children under the age of six months (Zehra et al., 2021).

In Kenya, assessment of infant nutrition status is usually based on WAZ. The trend in nutrition assessment is that the infant is expected to double its birth weight by the time that infant is six months old. The infant is also expected to add at least 500g every month until they reach six months of age. This is of more importance to infants born prematurely. The above differences in ways to assess nutrition status of infants below six months of age, the study focused on WLZ, WAZ and Length for Age Z score (LAZ).

2.4 Postpartum depression and nutrition status

Malnutrition remains one of the leading causes of death and morbidity among children under the age of five years in developing countries. The global stunting rate is 21.9% while in Africa it is 33%. Global wasting rates are 7.3% while in Africa it is 4.2%. Global overweight rates are 5.9% while in Africa 4.2% (UNICEF, 2019).

WHO suggests that the first 1000 days are crucial for the growth and development of a child. This, therefore, leads to more strategies in place to ensure the proper growth and development of a child. A mother's mental health has been found to be associated with a child's growth and development (Bennett et al., 2016) and In this regard, studies have tried to look at the association between a child's nutrition status and mothers' mental health.

A study conducted in Rio de Jeneiro in Brazill to analyze the association between maternal mental health and the nutrition status of infants at six months of age, found that maternal mental health affects the nutrition status of infants. Children of mothers with severe mental disorders had an average weight-for-length of 0.37 z-score lower than children whose

mothers had no mental disorder (Hassan, Werneck & Hasselmann, 2016). In another study conducted in 2014 in Uganda to determine the association between maternal depression and malnutrition, similar results were obtained where 42% of children of depressed mothers were malnourished as compared to 12% of the children whose mothers were not depressed (Ashaba et al., 2015). Similarly in Ethiopia, infants of depressed mothers were found to be three times more likely to be stunted than those of mothers without post-partum depression (Girma, Fikadu & Abdisa, 2019). In another study conducted in Bangladesh, Vietnam and Ethiopia, maternal mental health was found to be associated with under-nutrition and diarrhea while there was no association with wasting (Nguyen et al, 2018).

In Kenya where under nutrition is high, a study done in Kenyatta National hospital found that 64.1% of mothers with moderate or severe depression had under-nourished babies as compared to 5.1% of mothers who did not have depression (Haithar et al.,2018). Similarly, a study done in a low-income urban settlement in Nairobi found that infants of mothers with post-partum depression were more likely to be underweight as opposed to those of mothers without the condition with an odds ratio of 5.43 (Madeghe et al., 2016).

The above studies confirm that infants and children of mothers with post-partum depression have poor nutrition status and poor growth and development. The only difference is whether it is stunting or wasting being manifested.

The above studies clearly shows that postpartum depression has a significant effect on the nutrition status of infant but the ways in which postpartum depression affects nutrition status of infants is not well researched. Therefore, my study focused on the feeding

practices of mothers who already had postpartum depression. Stunting, wasting and underweight were extensively discussed to understand their magnitude in mothers with postpartum depression.

2.5 Postpartum depression and Breastfeeding practices

The WHO recommends that a child should exclusively breastfeed for the first six months of life. This is because research over the years has shown that breastfeeding has positive impacts on both the baby and mother and it prevents infant mortality and morbidity from common illnesses (WHO, 2009; Motee & Jeewon, 2014). Breastfeeding has also been linked to prevention of PPD or assisted in smoother recovery from PPD symptoms (Figueiredo, Canário & Field, 2014). Mothers with post-partum depression are at a higher risk of not following the proper infant feeding practices and they may even experience difficulties in breastfeeding(Ahishakiye et al., 2020 as well as early breastfeeding cessations according to literature reviews conducted by Figueiredo (Dias & Figueiredo, 2015).

Infant formulas have always been seen as a better alternative, especially for those mothers who undergo PPD, but it is only feasible for those in high resource areas leaving those who cannot afford it to start introducing other foods to their infants before they attain 6 months of age. Nevertheless, mothers in low socio-economic areas tend to either exclusively breastfeed their baby or introduce foods early and this is because they cannot be able to afford the milk substitutes as compared to those from high socio-economic status (Silva et al., 2017).

A study conducted in Kenya found that mothers experiencing post-partum depression were more likely to not practice exclusive breastfeeding and as compared to those without PPD (Madeghe et al., 2016). Infants of mothers with PPD have also been reported to have high energy intake, especially those between 4-6 months according to a study conducted in the United States of America and this is because of the early introduction of other foods (Hurley et al., 2015; Gaffney et al, 2014).

There are many studies done on different aspects breastfeeding practices in Kenya but there are limited studies focusing on postpartum depression and breastfeeding practices. Studies that are there do not adequately represent this population, leading to a lack of understanding of the unique challenges they face regarding breastfeeding initiation, duration, and exclusivity. Therefore, prompting the need to add more knowledge and understanding on the same.

2.6 Socio-demographic factors, behavior and characteristics of PPD

Mothers with post-partum depression present with symptoms like crying frequently and constant worry, lack of interest in normal activities and self-care, and sometimes feeling of hurting themselves or the baby (Stewart & Vigod, 2016). A study by Edvinsson et al., 2017 found that mothers with PPD displayed signs of emotional numbing which can lead to long-term negative child development and it can affect child's well-being. The precise etiology of PPD is unknown (Brummelte & Galea, 2016) although many studies have found certain specific risk factors to be associated with developing PPD.

A meta-analysis of articles in India from 2000 to March 2016 found that economic stress, history of psychiatric illness, presence of domestic violence, the birth of a female baby, marital conflict and lack of partner support were risk factors for developing post-partum depression (Upadhyay et al., 2017b). These results are similar to a study in both Kenya and Ethiopia where depression during pregnancy, financial difficulties and conflict with a partner were associated with increased risks of developing PPD (Ongeri et al., 2018; Abadiga, 2019)Unplanned pregnancy, history of mental illness (Fiala et al., 2017) and age of the mother in another study conducted in Ethiopia were the major risk factors for developing PPD (Kerie, Menberu & Niguse, 2018). A study in South Africa also found that post-partum depression is directly related to stressors that occur in mothers' lives (Davies et al., 2016) especially both physical and sexual violence during pregnancy (Bitew et al., 2019; Tho Nhi et al., 2019; Turkcapar et al., 2015).

Many studies have hypothesized the role of hormones in stimulating post-partum depression while others in contrast have found no association between post-partum depression and reproductive hormones (Guintivano et al., 2019). Schiller et al., 2015 bring out an important role played by reproductive hormones including the processing of basic emotion, arousal, and motivation. This can indirectly lead to PPD by influencing psychological and social factors. Vitamins have also been postulated to play a significant role in stimulating PPD. A study conducted among Iranian women of reproductive age found that women whose vitamin D level was less than 20ng/ml were more than 3 times

more likely to develop PPD than those whose level was above 20ng/ml (Abedi et al., 2018). This can be because of the role that vitamin D plays in mood stabilization.

Culture has been seen to be a strong determinant for post-partum depression where a mother is seen as a supermom and she needs to put the needs of the baby above hers. If this does not happen, then a mother is left with self-pity and withdrawal and would not want to seek medical help majorly because there are few places to seek help and people around might not understand her feeling (Williams, Sarker & Ferdous, 2018). An autoethnography examination of post-partum depression found that cultural ideologies concerning intensive mothering where a mother is expected to provide continuous nurturing while putting the baby's needs above hers and expert guidance, shame, the stigma of having PPD, failure and guilt were the most common feelings of mothers with PPD (Frankhouser & Defenbaugh, 2017). Ethnicity, education level and low economic status were also found to be among the risk factors for developing PPD (Corrêa et al., 2016; (Di Florio et al., 2017).

DHIS data indicates that less than 1% of new patients are diagnosed with a mental disorder in the outpatient clinic as opposed to the target of 3% (KHSP, 2016). This is due to little or lack of proper diagnosis of mental issues in the outpatient clinic. Studies done in Kenya indicate that there is a strong association between economic stress, partner conflicts and postpartum depression, (Ongeri et al., 2018), thus there is need to raise awareness through public health sensitization and mass screening during the clinic visits (Hansotte et al., 2017).

2.7 Breastfeeding practices and nutrition status

Exclusive breastfeeding refers to feeding a child below six months with breast milk only, be it directly from the breast or expressed, with no addition of any liquid or solids apart from drops or syrups consisting of vitamins, mineral supplements or medicine and nothing else (WHO/UNICEF, 2010).

Breastfeeding is the most efficient way of providing infants with proper nutrition and its benefits are well established. Breast milk contains antibodies that fight diseases and it also contains nutrients important in nourishing infants. Lack of exclusive breastfeeding is associated with an increased risk of malnutrition and diarrheal diseases. The majority of child-related deaths can be prevented with appropriate breastfeeding practices (Victora et al., 2016b).

A study conducted among Saharawi mothers and their infants in refugee camps in the Tindouf area found that none of the malnourished children were being exclusively or predominantly breastfed (Lerseth & Marie Steffensen, 2013). In another study in Bangladesh, it was found that communities with a low rate of colostrum introduction to infants had a greater prevalence rate of under nutrition (Akther et al., 2019). Similarly, after analysis of three waves of Bangladesh Demographic and Health Survey data, it was found that infants who were terminated from EBF anytime within the first 4 months of life, then they were two times more likely to become underweight as opposed to those babies whose EBF was not terminated (Khan & Islam, 2017). These findings are similar to the study by Islam which found that the prevalence of stunting was significantly higher in

children under-five years who were not exclusively breastfed, delayed initiation to breastfeeding and complementary feeding (Islam et al., 2014).

Bottle feeding has also been shown to increase the incidence of diarrheal diseases and thus affect the nutrition status of infants. In a study conducted in Ethiopia, breastfeeding was associated with significantly lower odds of wasting as compared to bottle feeding (Fekadu, Mesfin, Haile & Stoecker, 2015). Breastfeeding practices among infants are influenced by many factors including family structure and cultural perception (Borresen et al., 2016) and this is why proper and constant education is important, especially to young and first-time mothers.

2.8 Summary of the literature review

The above literature clearly shows that post-partum depression is high among women during the post-partum period. Even though this disease has high prevalence rate, it usually go unnoticed and undiagnosed. Women from low socio-economical status, those with history of depression, women with non-supportive husbands or those in abusive relationships have an increased risk of developing post-partum depression.

Exclusive breastfeeding is recommended for the first six months of a child's life. This might not always be the case for a lot of women especially in the developed world because of the accessibility to infant formula as well as the recommendation from their various health association committees. On the other hand, post-partum depression can lead to a

lack of exclusive breastfeeding and poor infant feeding practices thus leading to under-nutrition which remains high in Kenya.

The most widely used method to assess the nutrition status of children under the age of six months is weight for length Z-score. There is some evidence in studies conducted in Africa to suggest the effectiveness of using MUAC measurement although there is no globally acceptable threshold to identify children under the age of six months who are at risk of malnutrition using MUAC.

Proper breastfeeding practices are associated with lower rates of malnutrition although other factors may also contribute to malnutrition including diseases. Mothers with post-partum depression tend to not practice exclusive breastfeeding because of a lack of attachment with the baby or themselves and also a lack of confidence in their ability to breastfeed.

CHAPTER THREE: METHODOLOGY

3.1 Research design

A cross-sectional analytical study design was employed to determine the breastfeeding practices and nutrition status of infants of post-partum depressed mothers. This study design is recommended because it allows for the simultaneous assessment of causal and outcome-related relationships.

3.2 Study variables

The dependent variable is nutrition status while independent variables include postpartum depression, breastfeeding practices and socio-demographic factors.

3.3 Study area

Nairobi County is the capital city of Kenya and as such, it has one of the highest populations in Kenya. Mbagathi hospital and Mama Lucy Kibaki hospital were chosen because of the large number of mothers who attend their MCH clinics, they are public hospitals and they also cater to individuals of similar socio-demographic status in Nairobi County. The two hospitals at the time of data collection were both level 4 hospitals.

3.4 Study population

3.4.1 Target population

Post-partum depressed mothers and their infants in Mama Lucy Kibaki and Mbagathi hospitals in Nairobi County were targeted.

3.4.2 Accessible population

Postpartum depressed mothers in Mbagathi and Mama Lucy Kibaki Hospital.

3.4.3 Inclusion criteria

Post-partum depressed mothers with infants 6 - 23 weeks of age in Mama Lucy and Mbagathi hospitals that consented to participate

3.4.4 Exclusion criteria

Mothers who did not initiate breastfeeding after delivery, mothers too weak to speak, mothers who were taking medication for any mental health problems, mothers suffering from chronic diseases, mothers who did not initiate breastfeeding because of post-partum depression and finally infants who were sick.

3.5 Sample size determination

A sample size of 202 women with PPD was obtained using the Cochran formula as cited in Israel, (1992);

no (the desired sample size)= Z2pq /e2

Z = the standard normal deviate at 95% confidence level (1.96)

(1-p)= the desired confidence level.

e= desired level of precision

P=13.9% taken to be the estimated prevalence of postpartum depression

At 95% confidence level, n0= (1.96)2 (0.139) (1-0.139)/ (0.05)2. N0=184

10% added to cater for non-respondent =10% of 184 =18

Total sample size: 184+18 = 202

3.6 Sampling technique

Nairobi County was purposively selected because it is densely populated with people of all socio-economical standards. Purposive sampling was also employed in selecting both Mbagathi and Mama Lucy Kibaki hospitals because they cater to low, middle and upper-middle-class people, they are both public hospitals and finally because of the high number of women who attend the MCH clinics. These mothers were in the MCH clinic for the monthly and routine infant checkup. Consecutive sampling which is a type of sampling technique where anyone who meets the inclusion criteria is selected until the sample size is achieved was then employed to get the individuals who will take part in the research. This is because of the small number of mothers with postpartum depression who attend both hospitals per day.

3.7 Data collection tools

A researcher-administered questionnaire was used to collect data on breastfeeding practices, nutrition status of infants and maternal socio-demographic factors (Appendix C). Anthropometric measurements were measured using a weighing scale and height board to collect data on the nutrition status of infants.

Key Informant Information was used to fully determine women who had post-partum depression after administering Edinburgh's postpartum depression scale and screened positive (Appendix B). The information came from a clinician who carried out further diagnosis on the respondents.

3.8 Pretesting of the research tools

3.8.1 Validity of research tools

To ascertain the validity of the data collection tools, the tools were subjected to critique by my supervisors as well as other professionals in the Nutrition and Dietetics field in Kenyatta University and their comments were incorporated into the tools before being used in the field. Structured and validated questionnaires were modified and used in this study. The research assistants were trained to ensure that they complied with standard procedure during data collection.

3.8.2 Reliability of research tools

The consistency of the questionnaire was determined by the test re-test method and the same questionnaire was used for every mother. Pre-testing of the questionnaire was done in Pumwani Hospital whereby 20 respondents were interviewed. Reliability analysis was assessed using cronbach's alpha. The items measuring nutrition status was used to determine the internal consistency of the questionnaire. The three items included weight for age, weight for height and height for age. Cronbach alpha was 0.60 with the three items .This was due to the fact that the number of items were few but once an item was deleted the figure rose to 0.74.The results therefore indicated that internal consistency was acceptable with $\alpha = 0.74$.

Edinburgh postpartum depression scale (EPDS) was used with the assistance of the clinical officer to screen and diagnose mothers with post-partum depression. EPDS is a tool that was developed to screen for postpartum depression. It consists of a list of 10 items that describes how a mother has been feeling for the past one week. The questions are then

added and the maximum score is 30. EPDS is a screening test and that is why the clinical officer is able to interpret the results further and carry out the clinical interview with mothers with high scores of 13 and above.

3.9 Training of research assistants

Two female research assistants with at least a diploma in Nutrition and Dietetics and a qualified clinical officer were chosen. The purpose of the study and different terminologies used were explained to them. The two research assistants were trained on how to fill the questionnaire in a standardized and uniform manner, practical and role-play on interview skills and taking anthropometrical data (Appendix J). The clinical officer was responsible for diagnosing mothers with post-partum depression after they have undertaken the EPDS test.

3.10 Data collection procedure

Data was collected using a pre-tested questionnaire and anthropometric assessment tools. The data was collected for a period of six months starting from June to November 2021. Every single day mothers coning for routine checkups of their infants who were between the age of 6-23 weeks were identified and screened for PPD. EPDS tool was used then followed by a clinical officer assessment to confirm the results. Mothers whose postpartum depression test was positive were then picked and included in the study. The age of the infants was again confirmed in the child-mother booklet to ensure that the infants fall within the inclusion criteria. The mothers present were taken through the objectives and purpose of the study and those who consent to participate in the study were interviewed.

The researcher administered a questionnaire that captured information on demographic factors, and breastfeeding practices. A calibrated weighing scale was used to assess the weight of infants with no clothing on. The weight measurements were taken at a precision of 0.1kg. Length was taken using a stadiometer and the readings on the scale were taken at a precision of 0.5cm.

The anthropometric measurements were taken twice to ensure reliability and accuracy and the average value was used as the final measurement. The study continued in the two hospitals until a sample size of 202 was attained for analysis.

3.11 Data analyses Plan

Data was cleaned and coded before entry into SPSS where further cleaning to remove outliers was done. Data were analyzed using Statistical Packages for Social Sciences (SPSS) version 25. Weight-for length and Weight-for Age z-scores and length-for-age were used to determine the nutrition status of the infants using WHO cut-offs. The analysis was done using ENA for SMART. Descriptive statistics were used to describe data on nutrition status, breastfeeding practices and socio-economic factors of post-partum depressed mothers.

Breastfeeding practices was determined by whether the child is exclusively breastfeeding or not and if there is already an introduction of complimentary foods. A Chi-square test was used to establish the association between categorical variables like breastfeeding practices and the nutrition status of the infants. Association between nutrition status

breastfeeding practices and socio-economic factors was tested using Pearson correlations and logistical regression. Lastly, data was presented using tables and graphs. The summary of data analysis matrix is illustrated in Table 2.1.

Table 2.1: Data analysis matrix

	OBJECTIVES	VARIABLES	TYPE OF VARIABLE	STATISTICAL TEST
1.	To establish the socio-demographic factors of households of PPD mothers in the selected hospitals in Nairobi City county	-Socio-demographic factors	Independent	Range, percentage, mean,
2.	To determine breast-feeding practices of post-partum depressed mothers in the selected hospitals in Nairobi City County.	-Breastfeeding practices	Independent	Range, percentage, means, standard deviation and 95% CI.
3.	To determine the nutritional status of infants 6-23 weeks of age born to mothers experiencing PPD	-Nutrition status of infants	Dependent	Range, percentage, means, standard deviation and 95% CI.
4.	To evaluate the association between breastfeeding practices, nutrition status of the infants and socio-demographic of PPD mothers.	-PPD -Breastfeeding practices -Nutrition status	Dependent and Independent	- -Chi-square - Pearson Correlations - Logistical regression

3.12 Logistical and ethical considerations

Approval to conduct the study was sought from the Kenyatta University Graduate School. Ethical clearance was sought from Kenyatta University Ethical Review Committee while a research permit was acquired from National Commission for Science, Technology and Innovation (NACOSTI) as well as permission from the head of the mother and child clinic

in the various hospitals. Informed written, signed or thumb-printed consent was sought and confidentiality of the data collected was assured by using codes rather than names. Respondents voluntarily agreed to participate in the study. Infants with poor nutrition status were referred to the nutrition clinic while mothers with postpartum depression were sent to the psychology clinic for a psychological review, care and treatment.

CHAPTER FOUR: RESULTS

4.1 Introduction

This section presents the study findings which are in line with the study objectives. A total of 202 mothers with post-partum depression aged between 17 to 44 were identified and interviewed. Out of those mothers 7 did not finish answering the questionnaire while 5 refused to participate. Therefore 190 mothers participated fully in the study. This accounts for 94% of the total sample size. Therefore the response rate was 94%.

4.2 Socio-demographic factors of household postpartum depressed mothers in the selected hospitals in Nairobi City County

4.2.1 Demographic characteristics of mothers with PPD

The mean age of mothers was 27.28 (SD= 5.643) and the median was 26.38 while 59.6% of the mothers were between the ages of 20-29. Majority of the mothers (78.9%) were married, Protestants (61.6%) and 53.7% reported having secondary education as their highest level of education. This is shown in Table 4.1.

Table 4.1: Demographic characteristics of the mothers with PPD

		Frequency N=190	**Percentage**
Age	10-19	13	6.8
	20-29	113	59.6
	30-39	61	32
	40-49	3	1.6
Religion	Catholic	62	32.6
	Protestant	117	61.6
	Muslim	8	4.2
	Others	3	1.6
Marital status	Single	36	18.9
	Married	150	78.9
	Partnered	1	0.5
	Separated	2	1.1
	Widowed	1	0.5

4.2.2 Infants' age and sex

A total of 190 infants were included in the study. As illustrated in Table 4.2. The sex of the infants was as follows with 45. 8%% being male and 54.2 % female. Most (42.1%) of the infants were aged 1-2 months and the least (20.5%) were aged between 5-<6 months of age. The ratio between girls and boys was 0.8. The mean age was 14.23weeks (SD=6.114).

Table 4.2: Distribution of age and sex of the infants

	Boys N= 87		Girls N =103		Total N = 190		Ratio
AGE (months)	no.	%	no.	%	no.	%	Boy: girl
1-2	35	43.8	45	56.3	80	42.1	0.8
3-4	35	49.3	36	50.7	71	37.4	1.0
5- <6	17	43.6	22	56.4	39	20.5	0.8
Total	87	45.8	103	54.2	190	100.0	0.8

4.2.3 Socio-demographic characteristics of mothers with PPD

Majority (73.7%) of the respondents had an income of below Ksh. 20,000 per month while 0.5% had an income of above Ksh.100000. The mothers who reported to be housewives were 45.8%, 17.9% employed, 18.9% were doing business while 0.5% were students. The vast majority (71.1%) of the mothers reported that their husband was the sole provider, 5.3% said it was both her and her partner, 13.7% said they were the sole provider while 0.5% and 1.6% responded that a sponsor and sister respectively were the sole provider. The mean number of children birthed by the women was 2.02 (SD= 1.016) while mode and median were 1 and 2 respectively .This is illustrated in Table 4.3.

Table 4.3: Socio-demographic factors of postpartum depression among the mothers

		Frequency N= 190	Percentage
Level of Education	Primary Education	44	23.2
	High School	91	47.9
	Tertiary Education	55	28.9
Household Level of Income	0 - 10000	58	30.5
	10001 – 20000	82	43.2
	20001 – 30000	30	15.8
	30001 – 40000	12	6.3
	40001 – 50000	7	3.7
	Above 50000	1	0.5
Employment Status	Employed	34	17.9
	Unemployed	32	16.8
	Business	36	18.9
	Housewife	87	45.8
	Others (student)	1	0.5
Sole Provider	Both of us	10	5.3
	Myself	26	13.7
	My parents	15	7.9
	My partner	135	71.1
	My sister	3	1.6
	Sponsors	1	0.5
Number of Children	1	72	37.9
	2	61	32.1
	3	44	23.2
	4	9	4.7
	5	3	1.6
	6	1	>0.5

4.2.4 Characteristics of postpartum depression

More than half (53.2%) of the mothers had no one to help them take care of the children while 41.1% felt like the social apathy from the family and partner was not enough as illustrated in Table 4.4.

Table 4.4: Characteristics of postpartum depressed mothers

		Frequency N = 190	**Percentage**
Social empathy from family and partner enough	Yes	112	58.9
Assistance at home	House help	15	7.9
	Parents	14	7.4
	Partner	34	17.9
	Myself	101	53.2
	Relatives	7	3.6
	Siblings	19	10.0

The proportion of mothers who had not previously experienced some form of physical or sexual violence was 84.7% while those who had experienced some form of physical or sexual violence with their current intimate partner was 19% as illustrated in Figure 4.1 and Figure 4.2 respectively.

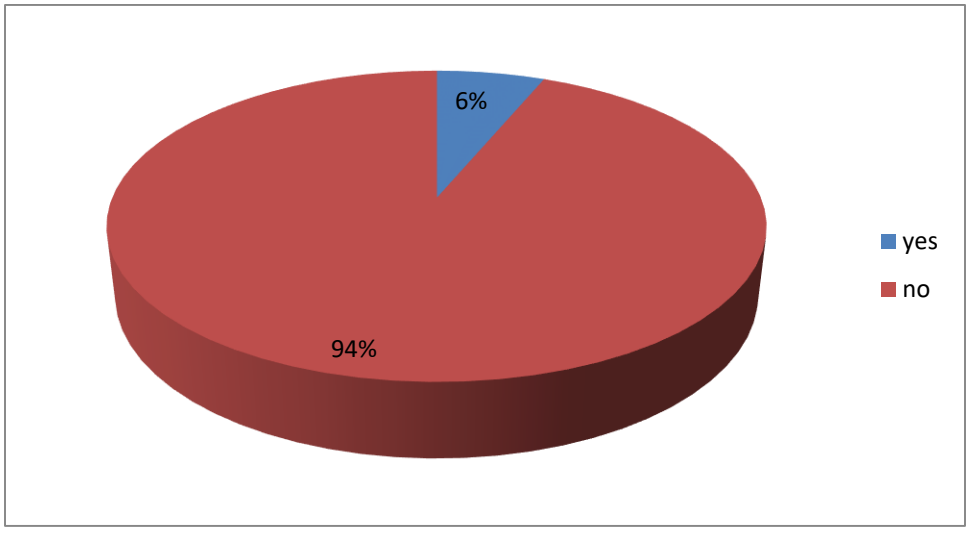


Figure 4.1: History of physical or sexual violence among mothers with PPD

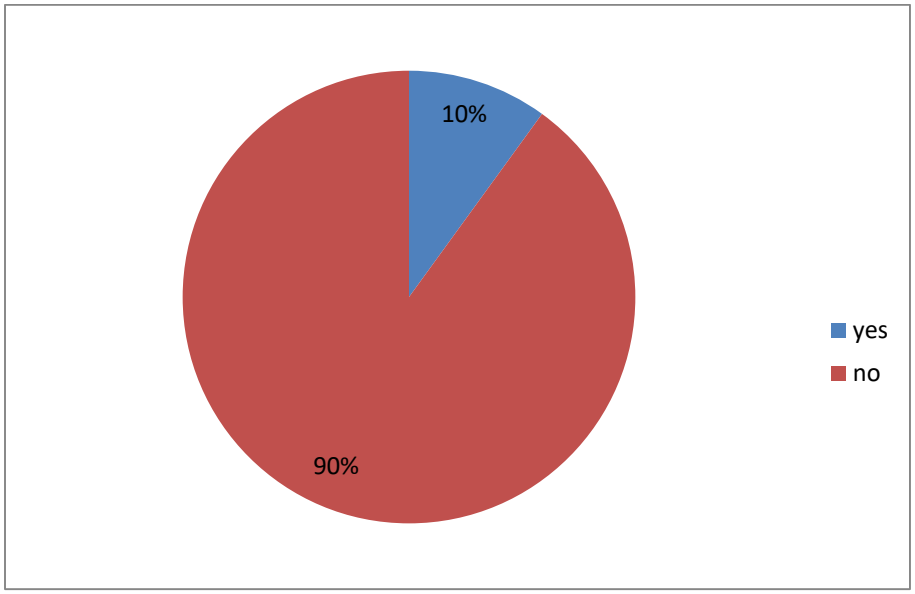


Figure 4.2: Sexual or physical violence with current intimate partner among mothers with PPD

I sort to find out if any of the mothers interviewed had a known family history of depression. Out of the 190 mothers interviewed, 6.3% of the mothers had a known family history of depression as demonstrated in Figure 4.3.

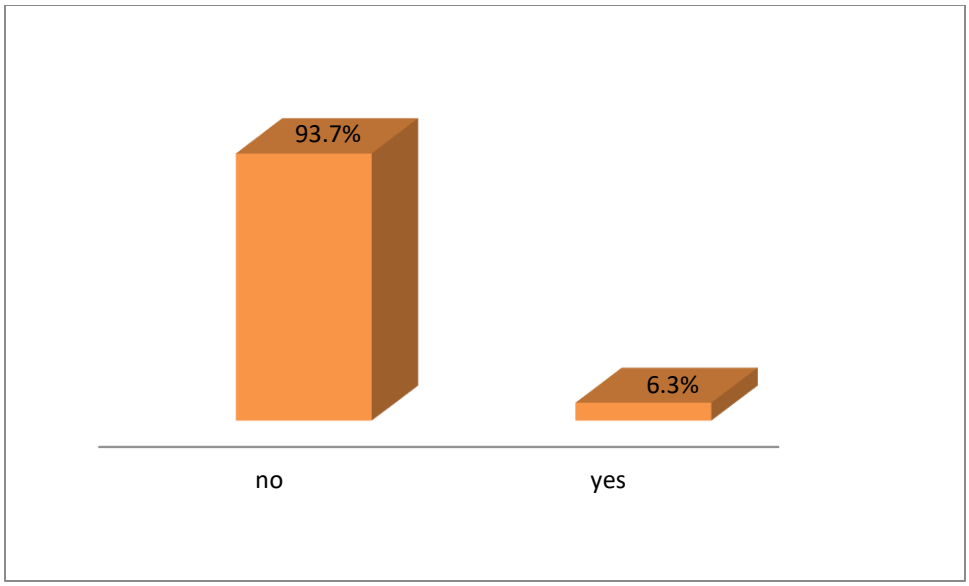
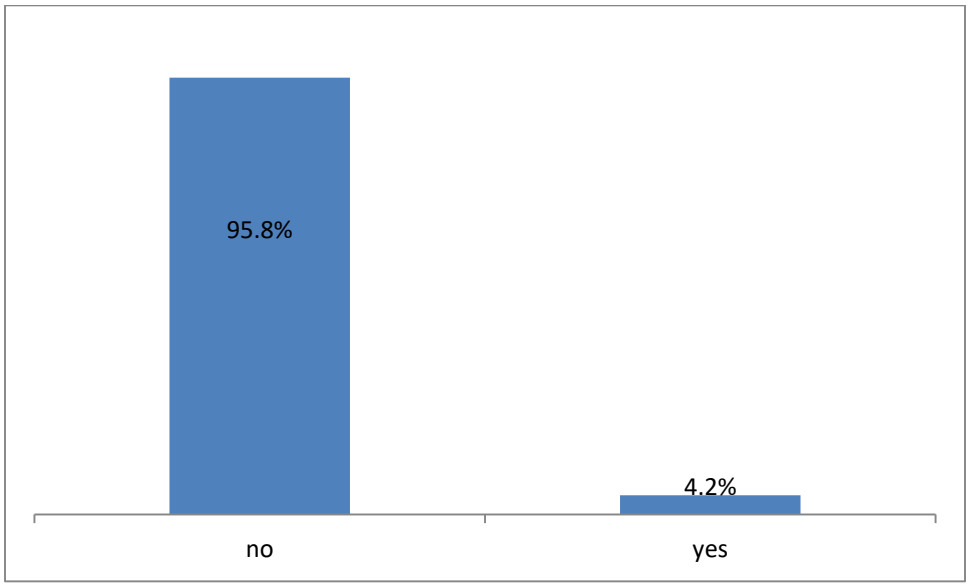


Figure 4.3: Family history of depression among mothers with PPD

Out of the 190 mothers interviewed, 4.2% of the mothers had undergone some form of treatment for depression whether it's talking to a friend, pastor or a psychologist as demonstrated in Figure 4.4.

Figure 4.4: Treatment for depression among mothers with PPD



4.3 Breastfeeding practices of post-partum depressed mothers in the selected hospitals in Nairobi County

4.3.1 Exclusive breastfeeding practice among mothers with PPD

According to the study, 76.8% of the mothers were practicing exclusive breastfeeding while 23.2% had introduced other things to the infants apart from breast milk since the baby was born as illustrated in Figure 4.1.

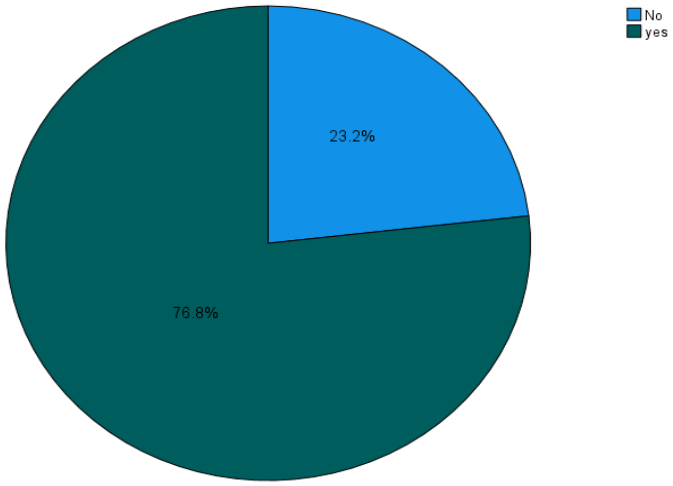


Figure 4.5: Exclusive breastfeeding practice among mothers with PPD

4.3.2 Assistance on how to breastfeed after delivery among mothers with PPD

The study shows that 82.9% of the study participants were shown how to breastfeed when the baby was born while 17.1% were not. This is illustrated below in Figure 4.6

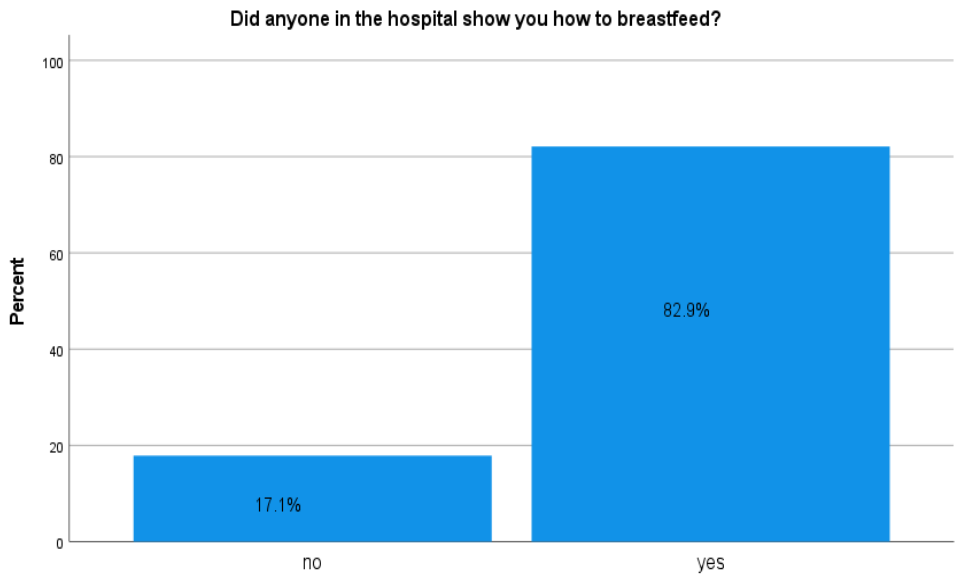


Figure 4.6: Breastfeeding assistance after delivery among mother with PPD

4.3.3 Milk production after delivery among mothers with PPD

Out of the 190 mothers assessed, 63.2% had the first milk production one day or less after the birth of the infant, 22.6% after two days,6.8% after 3 days and 7.4% after more than 4 days since the infant was born. This is clearly shown in figure 4.7

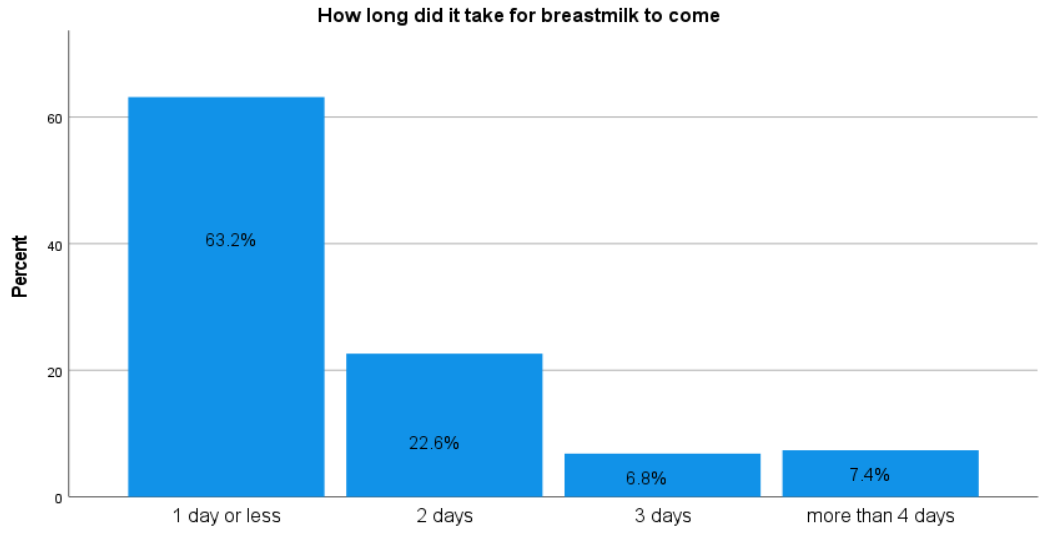


Figure 4.7: Milk production after delivery among mothers with PPD

4.3.4: Initiation of breastfeeding after delivery among mothers with PPD

More than half (63.2%) of the mothers initiated breastfeeding within the first one hour after delivery, 20%, 7.4% after one day,6.8% more than two days while 2.6% don't remember when it was but were certain that it was more than three days. This data is vividly illustrated in Figure 4.8.

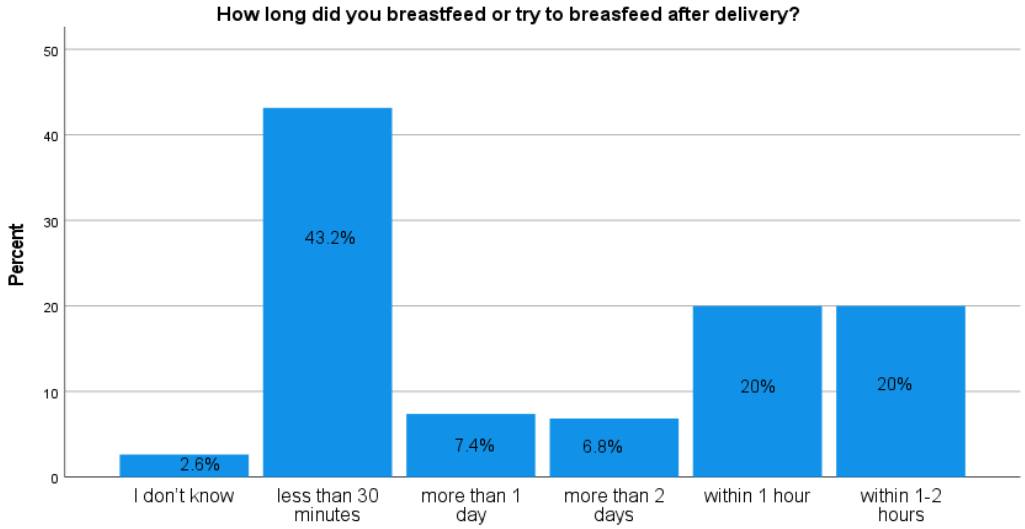


Figure 4.8: Breastfeeding Initiation after delivery among mothers with PPD

4.3.5: 24-hour feeding chart of infants

Out of the 190 infants assessed, 97.9% had taken breast milk during the last 24-hour period while none had been given sweet drinks or tea. Baby formula was given to 4.7% of the infants while 6.3% had baby cereal. The percentage of infants given cow's milk was6.8% had, 11.6% were given plain water, 2.1 had mushy food, 2.6% had fruit juice and sugar water each while 14.7% had been given vitamins or medicine and 1.1% had ORS (Oral rehydration Salt) as illustrated in Table 4.5.

Table 4.5: 24-hour feeding chart of the infants

Type of feed	Frequency n= 190	Percentage
Breast milk	186	97.9
Formula	9	4.7
Cow Milk	13	6.8
Sweet drinks	0	0
Vitamins, Medicine	28	14.7
Plain water	22	11.6
Fruit Juice	5	2.6
Tea or Infusions	0	0
Sugar water	5	2.6
Mushy or solid food	4	2.1
ORS	2	1.1
Baby cereal	12	6.3

4.4 Nutrition status of infants 6-23 weeks of age born to mothers experiencing PPD in the selected hospitals in Nairobi County

4.4.1 Prevalence of wasting among infants

Prevalence of wasting was 14.2% with 10.3 % being boys and 17.5% being girls. A majority (85.8%) of the infants aged 6-23 weeks old were normal. Prevalence of moderate and severe wasting among infants aged 6-23 weeks months old were 7.4% and 6.8 % respectively. The distribution of wasting in different age groups and sex was illustrated in Table 4.6.

Table 4.6: Prevalence of acute malnutrition based on weight-for-length z-scores among infants

	All N = 190	Boys N = 87	Girls N = 103
Prevalence of wasting (<-2 z-score)	(27) 14.2 %	(9) 10.3 %	(18) 17.5 %
Prevalence of moderate wasting (≥ -3and ≤-2 z-score)	(14) 7.4 %	(6) 6.9 %	(8) 7.8 %
Prevalence of severe wasting (<-3 z-score)	(13) 6.8 %	(3) 3.4 %	(10) 9.7 %

The majority (13.8%) of the infants who were moderately wasted were aged 1-2 months, while those who were severely wasted (7.7%) were between 5- <6 months while infants 3-4 months were least (5.6%) severely wasted as illustrated in Table 4.7.

Table 4.7: Prevalence of acute malnutrition by age, based on weight-for-length z-scores among infants

		Severe wasting (<-3 z-score)		Moderate wasting (≥-3 and ≤-2 z-score)		Normal ((>-2 z score)	
Age (months)	Total no. N = 190	No.	%	No.	%	No.	%
1-2	80	6	7.5	11	13.8	63	78.8
3-4	71	4	5.6	3	4.2	64	90.1
5- <6	39	3	7.7	0	0.0	36	92.3
Total	190	13	6.8	14	7.4	163	85.8

4.4.2 Prevalence of underweight among infants

This study revealed that the prevalence of underweight among infants was 21.1 % with 21.8 % being male and 20.4 % being female. A majority (84.9%) of the children 6-23

weeks were normal. The prevalence of moderate underweight and severe underweight was 6.8 % and 14.2 % respectively. This is illustrated in Table 4.8.

Table 4.8: Prevalence of underweight based on weight-for-age z-scores among infants

	All	Boys	Girls
	n = 190	n = 87	n = 103
Prevalence of underweight (<-2 z-score)	(40) 21.1 %	(19) 21.8 %	(21) 20.4 %
Prevalence of moderate underweight(≥ -3 and ≤-2 z-score)	(13) 6.8 %	(10) 11.5 %	(3) 2.9 %
Prevalence of severe underweight(<-3 z-score)	(27) 14.2 %	(9) 10.3 %	(18) 17.5 %

Underweight by age results showed that severe and moderate underweight was high among infants between 1-2 months (17.5%) and 5- <6 months (12.8%) respectively as illustrated in Table 4.9

Table 4.9: Prevalence of underweight by age, based on weight-for-age z-scores among infants

		Severe underweight**(<-3 z-score)**		Moderate underweight		Normal ((> -2 z score)	
Age (months)	Total no. N = 190	No.	%	No.	%	No.	%
1-2	80	14	17.5	4	5.0	62	77.5
3-4	71	9	12.7	4	5.6	58	81.7
5- <6	39	4	10.3	5	12.8	30	76.9
Total	190	27	14.2	13	6.8	150	78.9

4.4.3 Prevalence of stunting among infants

The prevalence of stunting in infants was 20.0% with 20.7 % being male and 19.4 % being female. The prevalence of moderate and severe stunting was 6.8 % and 13.2 % respectively as shown in Table 4.10.

Table 4.10: Prevalence of stunting based on length-for-age z-scores and by sex among infants

	All N= 190	Boys N = 87	Girls N = 103
Prevalence of stunting (<-2 z-score)	(38) 20.0 %	(18) 20.7 %	(20) 19.4 %
Prevalence of moderate stunting (≤-2 z-score and ≥-3 z-score)	(13) 6.8 %	(6) 6.9 %	(7) 6.8 %
Prevalence of severe stunting (<-3 z-score)	(25) 13.2 %	(12) 13.8 %	(13) 12.6 %

The study also revealed that 80% of the infants were normal. Infants between the ages of 1-2 months were highly severely stunted (16.3%) and those between 5- <6 months were moderately stunted (7.7%) as illustrated in Table 4.11.

Table 4.11: Prevalence of stunting by age based on length-for-age z-scores among infants

		Severe stunting (<-3 z-score)		Moderate stunting (≥-3 and ≤-2 z-score)		Normal (> -2 z score)	
Age (months)	Total no. N = 190	No.	%	No.	%	No.	%
1-2	80	13	16.3	5	6.3	62	77.5
3-4	71	9	12.7	5	7.0	57	80.3
5-<6	39	3	7.7	3	7.7	33	84.6
Total	190	25	13.2	13	6.8	152	80.0

4.4.4 Prevalence of overweight among infants

Prevalence of overweight among the infants was 3.2 % with 3.4 % being male and 2.9 % being female while severe overweight was 0.5 % .This is illustrated in Table 4.12.

Table 4.12: Prevalence of overweight based on weight for length cut offs among infants

	All	Boys	Girls
	n = 190	n = 87	n = 103
Prevalence of overweight (WLZ > 2)	(6) 3.2 %	(3) 3.4 %	(3) 2.9 %
Prevalence of severe overweight (WLZ > 3)	(1) 0.5 %	(1) 1.1 %	(0) 0.0 %

Infants between the ages of 5- <6 months were both highly overweight (5.1%) and severely overweight (2.6%) as illustrated in Table 4.13.

Table 4.13: Prevalence of overweight by age, based on weight for length among infants

		Overweight (WLZ ≥ 2)		Severe Overweight (WLZ ≥ 3)	
Age (months)	Total no.	No.	%	No.	%
1-2	80	2	2.5	0	0.0
3-4	71	2	2.8	0	0.0
5- <6	39	2	5.1	1	2.6
Total	190	6	3.2	1	0.5

4.5 Association between breastfeeding practices, nutritional status of the infants and socio-demographic factors of postpartum depressed mothers

Chi-square was used to determine the association between nutrition status and breastfeeding practices. Nutrition status was categorized into Normal, Severe Acute Malnutrition, Moderate Acute Malnutrition, Overweight and Severe overweight while

breastfeeding practices were categorized into either yes to exclusive breastfeeding or no to exclusive breastfeeding. There was no significant relationship between breastfeeding practices and nutrition status. All these applied for weight for height, weight for age and height for age as illustrated in Table 4.14

Table 4.14: Association between breastfeeding practices and nutrition status of infants

Variables	Chi-square test	Cramer's V
Exclusive breastfeeding Vs.		
Weight for Length	$\chi 2(3,n=190)=20.006^{a}$, p= <0.01	0.3
Weight for Age	$\chi 2(4,n=190)=6.632^{a}$, p=0.157	0.2
Length for Age	$\chi 2(4,n=190)= 5.794^{a}$,p=0.215	0.2

Logistical regression was further conducted to determine whether social apathy, home assistance and gender based violence with current partner could predict the likelihood that a mother will practice exclusive breastfeeding. The result is shown in Table 4.16.

Table 4.15: Association between breastfeeding practices and socio-demographic factors of mothers with PPD

Variables	Standardized beta coefficient	P value
Social apathy and support	-0.040	0.910
Home assistance	-0.204	0.563
Gender based violence with current partner	-1.007	0.045

Pearson correlation was further used to measure the strength and direction between different variables as illustrated in Table 4.15. A strong, negative and significant correlation was found between age of the infant and Exclusive breastfeeding, r = -0.341, n

= 190, $p < 0.01$. Income had a strong, positive and significant correlation with the level of education, r =0 .253, n = 190, $p < 0.05$.

Sexual violence with a current sexual partner had a strong, negative and significant correlation with the level of education, r = -0.222, n = 190, $p < 0.01$. Being assisted at home to take care of the household had a strong, positive and significant correlation with the level of education, r = 0.211 and income r = 0.313 at $p < 0.01$.

Table 4.16: Correlation of study variables

Correlation coefficient of Study Variables

Variables	**Pearson Correlation**	**P- value**
EBF Vs. Age of infant	-0.341	< 0.01
Gender based violence with partner Vs. Income	-0.222	< 0.01
Income Vs. Education	0.253	< 0.05
Home assistance Vs. Education	0.211	< 0.01
Home assistance Vs. Income	0.313	< 0.01

CHAPTER FIVE: DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter addresses the findings of the study while comparing the results with similar studies done on breastfeeding practices and nutrition status of infants with mothers who have been diagnosed with post-partum depression. The chapter also addresses conclusions as well as recommendations drawn from the study according to study objectives.

5.2 Discussions

5.2.2 Socio-demographic characteristics of mothers with PPD

Most of the mothers who participated in the research (59.6%) were aged between 20-29 with a median age of 26.4; this indicates an increase in attending postnatal clinics among young mothers. Mothers who attends postnatal clinic usually receive regular nutrition related education on proper infant and young child feeding practices (IYCF) (Table 4.1). This apparent positive influence on education is seen as majority of the mothers have at least secondary education.

This apparent positive influence of education on mothers, is supported by a study conducted in Ethiopia to determine the knowledge, attitude and nutrition practice in public hospitals that found that mothers who had at least secondary education were 2.5 times more knowledgeable on IYCF than those who did not while those who had attended college and above were 4.5 times more knowledgeable than those with only secondary education (Gezimu et al., 2022).

There was also a significant correlation between the age of the mother and education level $r=1.53$, $p < 0.01$. This show that the level of education was higher among older mothers.

As discussed in the literature, socio-economic status may be a factor contributing to post-partum depression with mothers from lower socio-economic status having a high chance of developing post-Partum depression. This assumption was supported by the results which indicated that the majority (73.7%) of the respondents had an income of below Ksh. 20000 per month (Table 4.2).This assumption is in line with a study conducted in rural South Africa which found that women who lack sufficient socio-economic resources are extremely vulnerable to worsening post-partum mental health (Silverman et al., 2022) as well as a study conducted in Ethiopia that found 72.3% of the respondents who had post-partum depression were from low socio-economic status (Toru et al., 2018). The results from this study also indicated that the higher the level of education among the women then the higher the income level.

More than half of the mothers (53.2%) had no one to assist them with the baby and household chores while 41.1% felt like social apathy and support from their partner and family was not enough (Table 4.3). This could explain why these mothers had postpartum depression because literature suggests that lack of social support from family, previous history of depression and intimate partner violence have a high odds of developing post-partum depression (Dadi et al., 2020). A systematic review on the epidemiology of post-partum depression in Ethiopia showed that marital problems and lack of support with the

household chores as well as the new born baby were associated with increased odds of developing post-partum depression (Duko et al., 2020).

The study also showed a significant correlation between both previous sexual or physical violence history and sexual or physical violence with a current intimate partner with the level of education (Table 4.15).This results is in line with the results of a study conducted in rural Ethiopia that found previous physical violence or physical and sexual violence from intimate partner was associated with development of post-partum depression (Azale et al., 2018; Bitew et al., 2019).

The more educated the women are the lesser chances of undergoing sexual or physical violence(Loembe, 2020; Bonnes, 2016). The study further revealed that the more educated a mother is the more likely they will have home assistance in taking care of the infant. All these can be explained by the fact that if one is educated, then they are likely to also have a spouse who is educated and literature suggest that level of education reduces the likelihood of engaging in intimate partner violence. When one is educated then she will likely look for work that will increase the level of income. Those who go out for work will need someone to take care of the child while they are at work.

5.2.3 Breastfeeding practices of the infants 6-23 weeks

Results from the study show almost all mothers were breastfeeding their baby. The rate of exclusive breastfeeding was 76.8% which is higher than the national rate of 60% (KDHS, 2022) yet lower than the WHO target of 90% (WHO, 2010). This number may be high

because majority of the infants in this study were below 4 months of age with 42% being less than 14 weeks old. This idea is supported by a pooled analysis of population based survey in Ghana from 2003-2017, which found that 60% of infants 0-3 months were exclusively breastfed while less than 40% of those between 4-5 months ,breastfeeding pattern included addition of water and puree (Mohammed et al., 2022).

Therefore, the results suggest that despite the challenges posed by PPD, a significant proportion of mothers are adhering to recommended exclusive breastfeeding practice. This finding contradicts the notion of a weak link between breastfeeding practices and PPD, indicating that mothers with PPD are capable of exclusively breastfeeding their infants.

This result however, contradicts with a study done among Maasai community in Kenya, which found that Infants at the age of 2 weeks are given fatty concoction which is laced with ghee (Chege et al., 2015). However, it's important to consider potential biases in reporting, such as social desirability bias, which may inflate exclusive breastfeeding rates whereby mothers might know what the correct or preferred answer should be because of attending antenatal and post-natal clinics and that is what they answered.

Moreover, the observation that only 2.1% of mothers had completely stopped breastfeeding their babies due to perceived insufficient milk or busy schedules highlights the need for further exploration into the psychological and practical barriers faced by mothers with PPD in sustaining breastfeeding. This number represented infants who were at least 4 months of age. The cessation of breastfeeding might just be a perception that there is reduced milk or

the breast milk is not enough to satisfy the baby and not necessarily reduced breast milk production (Rahman et al., 2016). This result is supported by a study conducted among Maasai women on their perception of breastfeeding and infant nutrition whereby the women perceived that breast milk alone was not sufficient to meet the nutritional needs of the infants (Dietrich Leurer et al., 2019).

The majority of the mothers initiated breastfeeding within the first one hour which is recommended by WHO (World Health Organization, 2010) because it stimulates the production of prolactin, which helps in milk production as well as oxytocin which facilitates ejection of milk (*KDHS,2014*.). This study is in agreement with a study conducted in Rwanda whereby 87% of the mothers initiated breastfeeding within the first one hour after giving birth (Ahishakiye et al., 2020). The early initiation of milk might be the reason why 63.2% of the mothers started producing milk less than one day after delivery.

5.2.4 Nutrition status of the infants

Adequate nutrition is required for optimum growth and development of children. Without the proper nutrition, children may experience growth faltering experiences including poor physical and cognitive development.

The present study found that the prevalence rate of stunting among infants was high at 20%. This rate is almost equal to the national stunting rate among children under six months of age which stands at 15.3% while that of children below five years stands at 18% (*KDHS,*

2022.). The high stunting rate may be attributed to maternal nutrition during pregnancy as well as while breastfeeding.

The results on weight for length Z-score which is a measure of wasting, showed that the prevalence rate was high at 14.2%. This is considerably lower than the rate of wasting in Africa of 33% as well as a study conducted in Burkina Faso which reviewed data of infants attending child welfare clinic found the wasting rate to be 30% among infants (Mwangome et al., 2019). However, the rates are higher than the national level which stands at 4.4% (KDHS, 2022).

The prevalence rate of underweight was equally high at 21.1% and this is higher as opposed to the national level of 7% (KDHS, 2022). Both wasting and underweight are of high public health significance while stunting was of medium public health significance according to WHO (World Health Organization, 2010.). The rate of stunting, wasting and underweight were high among these children as opposed to the national rates. This supports the results found in other studies which suggest PPD negatively affects the nutrition status of infants (Dadi et al., 2022; Farías-Antúnez et al., 2018). The disease history of the infants and the infant prior to data collection and maternal diet might also be the reason for the significantly high rates of stunting, wasting and underweight.

5.2.5 Association between breastfeeding practices, nutrition status and socio-demographic factors.

The results from the study show that 76.8% of the mothers were exclusively breastfeeding and because all mothers in this study had post-partum depression, this number would be way less if maternal mental health had a negative impact on exclusive breastfeeding. The number is way higher than the breastfeeding rate in the country. This refutes the report from (Alimi et al., 2022), and (Jalal et al., 2017) that found an association between breastfeeding practices and maternal mental health.

The study is also in agreement with other studies whose results show no association between exclusive breastfeeding practices and mothers mental health to children below 6 months of age (Wemakor & Iddrisu, 2018; Woldeyohannes et al., 2021). This suggests that despite experiencing PPD, many mothers in the study were still able to engage in exclusive breastfeeding, challenging assumptions about the relationship between maternal mental health and breastfeeding practices.

A strong, negative and significant correlation was found between the age of the infant and exclusive breastfeeding, $r = -0.341$, $p < 0.01$. This shows that as the infant ages the less likely the mother will practice exclusive breastfeeding. This can explain why some mothers started introducing other feeds including cow's milk, solid feeds and fruit juice. This trend resonates with findings from (Sha et al., (2019 and Dagla et al., (2021), suggesting early cessation of exclusive breastfeeding among postpartum depressed mothers.

The study also found that there was no significant relationship between breastfeeding practices and the nutrition status of the infants. This applied to weight for height, weight for age and height for age of the infants as illustrated in table 4.14. This result may be because the majority of the infants were below 14 weeks old and also the fact that they were attending post-natal clinics where they receive regular nutrition education. Another reason might be that the indicators for measuring nutrition status are more pronounced in children above 6 months of age. For those below 6 months of age, the trend of weight gain is more likely to be used because infants are expected to at least double their birth weight by the time they reach 6 months of age. The study also found an association between weight for age and education level.

Social apathy and having home assistance had a beta coefficient 0f -0.040 and -2014 respectively indicating a small negative relationship with whether a mother will practice exclusive breastfeeding. However, p value of 0.910 and 0.563 for both respectively were not statistically significant. This shows that they are not significant predictors of whether a mother will practice exclusive breastfeeding. The results from this study contradicts with other studies conducted in Bangladesh and Turkey that found a significant association between exclusive breastfeeding with social apathy and home assistance (M. J. Islam et al., 2021; Mercan & Tari Selcuk, 2021).

The results above can be because majority of the infants were below 14 weeks of age and also majority of the mothers were not breadwinners of the family. Another reason could be because of the increased education on the importance of exclusive breastfeeding in

hospitals where almost all the mothers were taught after delivering and during their antenatal and post-natal clinic visits.

The study further shows that an increase in gender based violence by one unit is associated with decrease in exclusive breastfeeding practices. P value of 0.045 indicates that it is statistically significant. This means that the association is unlikely due to chance. Therefore, mothers who experience gender based violence with their current partner are less likely to practice exclusive breastfeeding.

Gender based violence is among the risk factors for developing PPD. This result is in agreement with a systematic review conducted by (Mohammed et al., 2023) and (Normann et al., 2020) that showed that women who experience gender based violence with their intimate partner did not practice exclusive breastfeeding. This results contradicts that of a study done in Sweden that women who reported gender based violence exclusively breastfed their infant to a higher extent than those who did not report on violence history (Finnbogadóttir & Thies-Lagergren, 2017).

5.2.6 Summary of the findings

Demographic and socio-economic characteristics are important in determining the characteristics of women who have post-partum depression. The results from the study show that majority of the study participants had a monthly income of below Ksh. 20000 with ages ranging between 20-29 years and mostly with secondary education. The mean number of children was 2 while more than half of the mothers had no one to assist them at

home to take care of the infant and they also felt that social apathy from their partner and family was not enough. Majority of the mothers responded that their partner was the sole provider.

The rate of exclusive breastfeeding was higher than the national level at 76.8%. More than 80% of the mothers initiated breastfeeding within the first one hour after delivery and were shown how to breastfeed the baby with milk production starting less than one day after delivery

The prevalence rate of wasting, stunting and underweight were 14.2%, 20% and 21.1% respectively with infants below 10 weeks contributing majorly to these percentages. The prevalence rate of overweight and severe overweight was 3.2% and 0.5% respectively.

The rate of stunting, wasting and underweight were high among these infants as opposed to the national rates.

5.3 Conclusions

The study highlighted that mothers in the age group of 20-29 constituted the majority, with a significant portion being married and having attained secondary education. Most mothers reported a household income of below Ksh. 20,000 per month, with a predominant number being housewives and relying on their husbands as the primary providers.

A substantial proportion of mothers practiced exclusive breastfeeding (76.8%) and was provided with assistance on breastfeeding (82.9%) postpartum. A significant number initiated breastfeeding within the first hour after delivery (63.2%), showcasing awareness and adherence to recommended practices.

The prevalence of wasting, stunting and underweight among infants born to mothers experiencing postpartum depression was notably high, indicating a spectrum of nutritional challenges within the population.

There was no significant association found between breastfeeding practices and nutrition status. Further analysis revealed that factors such as social apathy, home assistance, and gender-based violence with current partners did not significantly predict exclusive breastfeeding practices. However, notable correlations were observed between certain socio-demographic factors such as age of the infant, income, and education level.

The hypotheses in this study that there is no association between post-partum depression and breastfeeding practices of infants 6-23 weeks, no association between post-partum depression and infant nutrition status, and no association between breastfeeding practices and infant nutrition status were all accepted

5.4: Recommendations

1. The study recommends continuous ongoing support and interventions by healthcare workers to promote sustained exclusive breastfeeding as the infant ages.
2. There is need to delve deeper into the understanding of how breastfeeding practices and the nutritional status of mothers are affected by post-partum depression. Exploring these aspects in both mothers who experience post-partum depression

and those who don't can shed light on the connections between them, adding more depth to our knowledge.

3. Research that is prospective or longitudinal in nature will also be helpful in evaluating the relationship between breastfeeding and postpartum depression. Such designs should take into consideration other potential risk within the breastfeeding, nutrition status and postpartum depression dynamics to better facilitate interpretation of the results.
4. Screening for women should be included among services being provided by healthcare professionals during postnatal period and in child welfare clinic since the condition mostly goes unrecognized and undiagnosed.
5. Sensitization of health care workers on PPD through continuous medical education, seminar and workshops.
6. There should be sensitization and awareness creation about symptoms, characteristics and risk factors of post-partum depression in the community by community health workers or through mass media. This will help mothers and their families to be able to identify them and seek help.
7. More research should also be done to understand quantitatively the role that early screening and timely treatment of postpartum depression in new mothers play in improving the breastfeeding experience.
8. Resources should be allocated in order to reduce the rate of postpartum depression by policy makers since it has a direct impact on infant mortality.

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APPENDICES

APPENDIX A: LETTER OF INTRODUCTION AND INFOMED CONSENT

Greetings. My name is Lydia Amoke, a student pursuing my master's degree from Kenyatta University. I have obtained permission from my University to carry out research that seeks to find out the breastfeeding practices and nutrition status of infants 6 months of postpartum depressed women. The objectives of the study are; to determine the nutrition status of infants 6-24 weeks of age born to mothers with PPD, to find out infant breastfeeding practices of mothers with PPD, to establish socio-economic factors of mothers with PPD and finally to evaluate association between PPD, breastfeeding practices and nutrition status of the infants and socio-economic factors of postpartum depressed mothers

Procedure to follow

My research team and I will give you a questionnaire to fill to determine if you have PPD and the clinical officer will evaluate the results. If the results turn out to be positive then we will ask you questions and you will be required to answer them as correctly as possible after which we will take height and weight measurements of your baby. Whatever information you give me will be treated with the utmost confidentiality and should we reach a question that you don't want to answer, please let me know and I will skip it. You can also stop the interview at any time. Participation in this study is voluntary and you have the right to refuse to participate and your decision will not change the care you receive from this hospital.

Discomforts and risks

This process will not expose you or the baby to any risks but it may add approximately 30 minutes to your usual hospital visit time.

Rewards

There will be no rewards whatsoever for agreeing to participate.

Benefits

If you agree to participate, the findings from this study will be useful to the Ministry of Health because it will provide guidance on maternal mental health and how it affects breastfeeding practices and eventually the nutritional status of children.

Confidentiality

The interview will be conducted in a private setting within the hospital. Your name will not be recorded in the questionnaire. The questionnaire will be kept in locked cabinets for safekeeping. Everything will be kept private.

I will appreciate your participation in this research.

Thank you

Yours Sincerely,

Amoke Lydia Achieng

LETTER OF CONSENT

I,……....

agree that the information concerning this research has been communicated to me including the benefits and risks that can be encountered while participating. I have been given the chance to ask any questions and my questions have been answered to my satisfaction. I have been assured that my record will be kept private and I can leave the study at any time I want to. I understand that I will still get the same care and treatment in this or other hospitals at any other time whether I decide to leave the study or not. My participation in this study is voluntary and therefore I accept to participate willingly.

Signature/thumbprint of the interviewee ……

Date……..

Investigator's statement

I, the undersigned, have explained to the volunteer in a language s/he understands the procedures to be followed in the study and the risks and benefits involved.

Name of the interviewer…….

Signature of interviewer……

Date……

For further information concerning the research or further clarification or to get in contact with the university please feel free to use any of the following contact information.

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APPENDIX B: EDINBURGH POSTPARTUM DEPRESSION SCALE

Study number_____ Nambari ya tafiti _____

Date of delivery_____ Tarehe ya kujifugua _____

Date of completion _____ Tarehe ya kujaza _____

As you have recently had a baby, we would like to know how you are feeling. Please CIRCLE the number next to the answer which comes closest to how you have felt IN THE PAST 7 DAYS, not just how you feel today.

Kwa vile umejifugua hivi karibuni, tungependa kujua namna unavyohisi.Tafadhali WEKA ALAMA YA MVIRINGO nambari ambayo iko umbavuni wa jibu ambalo linalokaribiana na vile ulivyokuwa ukijihisi SIKU SABA ZILZOPITA, na si vile tu unavyohisi leo.

SCORING

	ENGLISH	SWAHILI
	Here is an example, already completed. I have felt happy: a. Yes, all the time. b. Yes, most of the time. c. No, not very often. d. No, not at all. This would mean that "I have felt happy most of the time" during the past week. Please complete the other questions in the same way.	Huu ni mfano,tayari umeshajazwa. Nimehisi furaha: a. Ndio, wakati wote. b. Ndio, wakati mwingi. c. La, sio kila mara. d. La ,hata . Hii ingemaanisha "nimehisi furaha kwa wakati mwingi" katika juma iliyopita. Tafadhali kamilisha maswali haya mengine kwa utaratibu huohuo.

	IN THE PAST 7 DAYS:	KATIKA SIKU SABA ZILIZOPITA:
1	I have been able to laugh and see the funny side of things. a. As much as I always could. b. Not quite so much now. c. Definitely not so much now. d. Not at all.	Nimekuwa na uwezo wa kucheka na kuona upande wa furaha wa vitu. a. Kama vile nilivyokuwa b. Sio vile sana kwa sasa. c. Kwa hakika sivyo vile kwa sasa. d. Hata kamwe.
2	I have looked forward with enjoyment to things. a. As much as I ever did. b. Rather less than I used to do. c. Definitely less than I used to do. d. Hardly at all.	Nimetarajia kufurahia vitu. a. kama vile nilifanya daima. b. Afadhali kidogo kuliko nilivyokuwa. c. Kwa hakika kidogo kuliko nilivyokuwa. d. Hata kabisa.
*3	I have blamed myself unnecessary when things went wrong. a. Yes, most of the time. b. Yes, some of the time. c. Not very often. d. No, never.	Nimejilaumu mwenyewe pasipo sababu vitu vikivurugika. a. Ndio, wakati mwingi. b. Ndio, wakati mwingine. c. Sio mara nyingi. d. La, kamwe.

4	I have been anxious or worried for no good reason. a. No, not at all. b. Hardly ever. c. Yes, sometimes. d. Yes, very often.	Nimekuwa na wasiwasi au sumbuko pasipo sababu nzuri. a. La, hata kamwe. b. Hata kabisa. c. Ndio,wakati mwingine, d. Ndio, mara nyingi.
*5	I have felt scared or panicky for no good reason. a. Yes, quite a lot. b. Yes, sometimes. c. No, not much. d. No, not at all.	Nimeshikwa na hofu au kuangaika pasipo sababu nzuri. a. Ndio, hakika mara nyingi. b. Ndio,wakati mwingine. c. La, sio sana. d. La, kamwe.
*6	Things have been getting on top of me. a. Yes, most of the time I haven't been able to cope at all. b. Yes, sometimes haven't been coping as well as usual. c. No, most of the time I have quite coped well. d. No, I have been coping as well as ever.	Vitu vimekuwa vikinilemea. a. Ndio ,wakati mwingi sijaweza kuvumilia kabisa. b. Ndio, wakati mwingine sijaweza kuvumilia kama kawaida. c. La, wakati mwingi nimevumilia hakika vizuri. d. La,Nimevumilia vizuri kama kila wakati.

*7	I have been so unhappy that I have had difficulty sleeping. a. Yes, most of the time. b. Yes, sometimes c. Not very often. d. No, not at all.	Nimekuwa sina furaha hadi nimepata tatizo la kulala. a. Ndio,wakati mwingi. b. Ndio,wakati mwingine. c. Sio kla mara.. d. La, kamwe.
*8	I have felt sad or miserable a. Yes, most of the time. b. Yes, sometimes c. Not very often. d. No, not at all.	Nimekuwa na huzuni na masikitiko. a. Ndio,wakati mwingi. b. Ndio,wakati mwingine. c. Sio kla mara.. d. La, kamwe.
*9	I have been unhappy that I have been crying. a. Yes, most of the time. b. Yes, quite often. c. Only occasionally. d. No, never.	Nimekuwa sina furaha hadi nimekuwa nikilia. a. Ndio,wakati mwingi. b. Ndio,mara kwa mara. c. Mara chache tu. d. La, hasha.

QUESTIONS 1, 2, 4 are scored 0, 1, 2 or 3 from the top box respectively.

QUESTIONS 3, 5-10 (marked with*) are reverse scored, i.e 3, 2, 1, 0 from the top.

*10	The thought of harming myself has occur a.Yes, quite often b.Sometimes c.Hardly ever d.Never	Wazo la kujidhuru mwenyewe limenijia. a.Ndio.mara kwa mara b.Wakati mwingine c.Kwa nadra daima d.Hata

Maximum score: 30

Possible depression: 13 or greater.

Always look at item 10 (suicidal thoughts)

TOTAL SCORE_____

THANK YOU SO MUCH FOR YOUR CO-PERATION AND TIME.

ASANTE SANA KWA KUSHIRIKI NA WAKATI WAKO

APPENDIX C: QUESTIONNAIRE

1. What is your age?

2. What is your highest level of education?

- Tertiary education
- High school
- Primary school

3. What is your marital status?

- Single
- Married
- Partnered
- Separated
- Divorced
- Widowed

4. How many children do you have?

5. What is your religion?

- Catholic
- Protestant
- Muslim
- Others(specify)

6. What is your employment status?

- Housewife
- Employed

- Unemployed
- Others(specify)

7. Who is the sole provider?

- Me
- My partner
- My parents

8. What is your household level of income?

- Below 2000
- Below 40000
- Above 50000
- Above 100000

9. Have you ever experienced any form of physical or sexual violence before?

- Ye
- No

10. Have you experienced physical or sexual violence currently with your intimate partner?

- Yes
- No

11. Do you feel that social support or apathy from your partner and family is enough?

- Yes
- No

12. Have you had a previous history of depression?

- Yes
- No

13. Have you ever been treated for depression before?

- Yes
- No
- N/A

14. Do you know anyone in your with a history of depression?

- Yes
- No

15. How have you been feeling over the past two weeks?

(VERY GOOD)

(1)

(2)

(3)

(4)

(VERY BAD)

SECTION II: BREASTFEEDING PRACTICES

Date of interview .....

Child's date of birth.....

Is your baby a boy or a girl? Boy..... Girl.....

(Mtoto ni mvulana au msichana Mvulana.....msichana...)

1. Are you breastfeeding exclusively? (Unanyonyesha mtoto pekee)? Yes (ndio)..... No (hapana).....

2. About how long after your delivery did you breastfeed or try to breastfeed your baby for the very first time? (Ulianza kumyonyesha mtoto wako kwa mara ya kwanza katika muda gani)?

1. Less than 30 min (Kabla ya nusu saa).....

2. Within 1hour (baada ya saa moja).....

3. Within 1- 2hours (kati ya muda wa saa moja na saa mbili) .....

4. More than one day(zaidi ya Baada ya siku nzima).....

5. More than 2 days (zaidi ya siku mbili)…….

6. I don't know (sijui)……

3. How long did it take for your milk to come in? (Muda gani ulichukua kwa maziwa yako kuingia?

i) 1 Day or less (siku moja au chini ya siku moja).....

ii) 2 Days (siku mbili).....

iii) 3 Days (siku tatu).....

iv) More than 4 days (zaidi ya siku nne)

4. Did anyone in the hospital helped you to put the baby on the breast in order to breastfeed well? (Ulionyeshwa na kuelekezwa jinsi ya kunyonyesha ulipojifungua hospitalini?

1. Yes (ndio).....

2. No (hapana).....

5.How did you feed your baby after leaving the birth center?(Baada ya mtoto wako kuzaliwa ulimlisha namna gani?)

1. Whenever he or she cried or seemed hungry (Anapolia au akionekana mwenye njaa).....

2. On a schedule or routine(Kwa ratiba)

6. How many times did you breastfeed your baby last night between sunset to sunrise? (Ulinyonyesha mtoto wako mara ngapi jana usiku?)

7. How many times did you breastfeed your baby yesterday during sunlight? (Je! Ulimyoyesha mtoto wako mara ngapi jana mchana?)

8. How would you say you felt about breastfeeding during the first week you were breastfeeding? (Ulijisikiaje kuhusu kunyonyesha katika wiki ya kwanza?)

DISLIKED VERY MUCH (sikupenda kabisa)

(1)

(2)

(3)

(4)

LIKED VERY MUCH (nnimefurahia kabisa)

9. How would you say you feel about breastfeeding now that your baby is several weeks old? (Utasema unajisikiaje sasa kuhusu kunyonyesha vile mtoto wako ako na umri huu?)

DISLIKE VERY MUCH (sipendi kabisa)

(1).....

(2).....

(3).....

4).....

LIKE VERY MUCH (nafurahia kabisa)

10.

Since this time yesterday, has [NAME] received any of the following? Tangu Jana wakati huu [jina] alikula nini kati ya vifuatavyo?		FEEDING PER DAY{Milo kwa siku
Breast milk(Kunyonyesha)	1=YES(ndio) 2= NO(hapana)	
Formula (maziwa kopo)	1=YES 2=NO	
Cow milk(maziwa ya ng'ombe)	1=YES 2=NO	
Sweet drinks (juice drinks, soft drinks, soda, sweet tea, Kool-Aid, etc.) (vinywaji vitamu juice, soda,chai)	1=YES 2=NO	
Vitamins, mineral supplements, medicine(matone ya vitamin madini au dawa	1=YES 2=NO	
Plain water(maji matupu)	1=YES 2=NO	
Fruit juice(maji ya matunda)	1=YES 2=NO	
Tea or infusions(chai)	1=YES 2=NO	
Sugar water(Maji ya sukari)	1=YES	

	2=NO	
Mushy or solid foods(vyakula vya kupondaponda)	1=YES 2=NO	
Oral Rehydration Salts(ORS) solution(maji ya dawa ya kuhara)	1=YES 2=NO	
Baby cereal(uji wa mtoto)	1=YES 2=NO	

SECTION III: ANTHROPOMETRIC MEASUREMENTS

NAME…….. DATE OF BIRTH…… SEX……..

Measurements	1st	2nd	Average
Length			
Weight			

THANK YOU SO MUCH FOR YOUR TIME AND CORPORATION

ASANTE SANA KWA WAKATI WAKO NA KUSHIRIKI KWAKO.

APPENDIX D: APPROVAL OF RESEARCH PROPOSAL FROM KENYATTA UNIVERSITY GRADUATE SCHOOL

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Our Ref: H60/CTY/PT/38158/2017 DATE: 11th November, 2020

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR MS. AMOKE LYDIA ACHIENG REG. NO. H60/CTY/PT/38158/17

I write to introduce Ms. Amoke Lydia Achieng who is a Postgraduate Student of this University. She is registered for M.Sc. degree programme in the Department of Food, Nutrition & Dietetics.

Ms. Amoke intends to conduct research for a M.Sc. thesis Proposal entitled, "Breastfeeding Practices and Nutrition Status of Infants 6-24 Weeks of Post-Partum Depressed Mothers in Selected Hospitals in Nairobi City County, Kenya."

Any assistance given will be highly appreciated.

Yours faithfully,

PROF. ELISHIBA KIMANI
DEAN, GRADUATE SCHOOL

APPENDIX E: ETHICS APPROVAL

KENYATTA UNIVERSITY
DIRECTORATE OF ETHICS REVIEW COMMITTEE

Fax: 8711242/8711575
Email: chairman.kuerc@ku.ac.ke
Nairobi, 00100

P. O. Box 43844,

Tel: 8710901/12

Website: www.ku.ac.ke
Our Ref: **KU/ERC/APPROVAL/VOL.1**

Date: 2nd March, 2021

Lydiah Achieng
P.O Box 43844. 00100
Nairobi.

APPLICATION NUMBER: PKU/2221/I1365 BREASTFEEDING PRACTICES AND NUTRITION STATUS OF INFANTS 6-24 WEEKS OF POST-PARTUM DEPRESSED MOTHERS IN SELECTED HOSPITALIN NAIROBI CITY COUNTY, KENYA

This is to inform you that ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE*** has approved version 4 of the study protocol together with the attached consent forms dated 12.09.2020. Your application approval number is **PKU/2221/I1365.** The approval period is ***2nd March, 2021 TO 2nd March, 2022.***

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents. study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE.***
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE*** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE*** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.

APPENDIX F: NACOSTI RESEARCH LICENSE /PERMIT

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 607972

Date of Issue: 22/March/2021

RESEARCH LICENSE

This is to Certify that Miss.. lydia Achieng Amoke of Kenyatta University, has been licensed to conduct research in Nairobi on the topic: Breastfeeding practices and Nutrition Status of Infants 6-24 weeks of Post-Partum Depressed Mothers in Selected Hospitals in Nairobi City County, Kenya for the period ending : 22/March/2022.

License No: NACOSTI/P/21/9470

607972

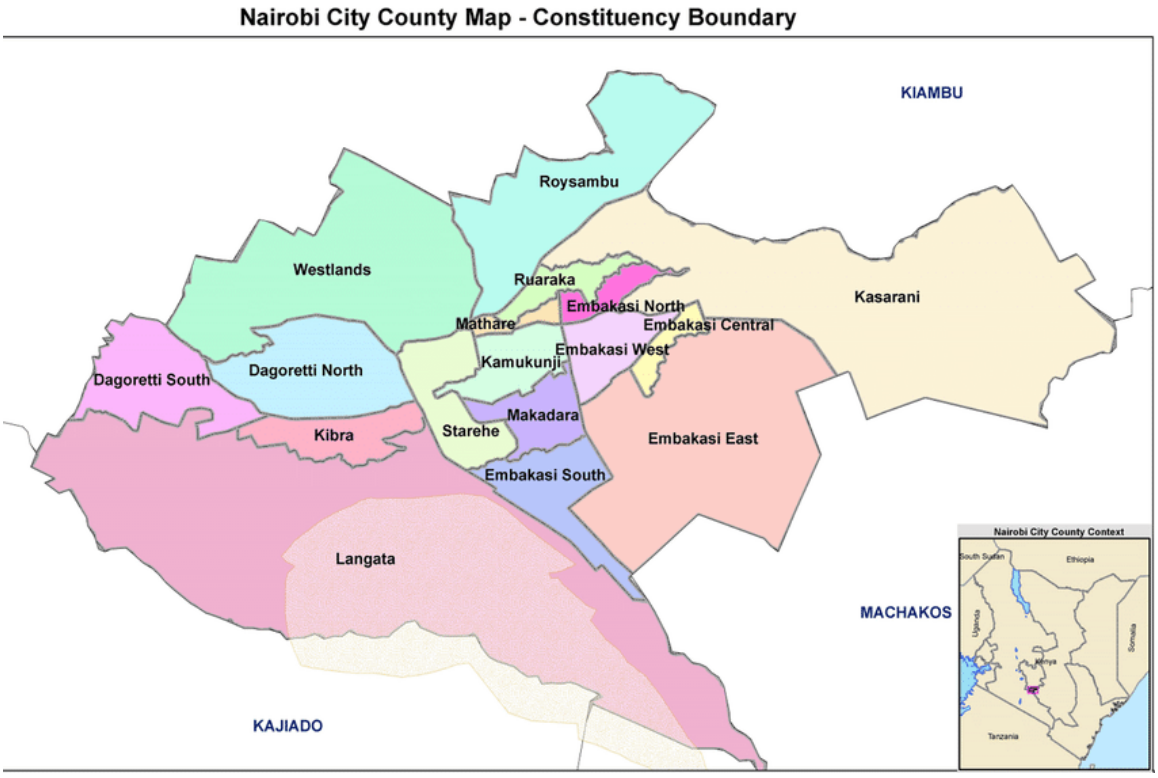
Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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

APPENDIX G: NAIROBI CITY COUNTY MAP



APPENDIX H: TRAINING SCHEDULE

Day 1: Orientation and Background

- 9:00 AM - 10:00 AM: Introduction to the research topic and objectives.
- 10:00 AM - 10:30 AM: Overview of postpartum depression (PPD) and its potential impact on breastfeeding and infant nutrition.
- 10:30 AM - 11:00 AM: Clarification of terminologies used in the Edinburgh Postnatal Depression Scale (EPDS), breastfeeding practices questionnaire, and socio-demographic factors questionnaire.
- 11:00 AM - 11:15 AM: Tea Break
- 11:15 AM - 12:30 PM: Detailed training on administering the EPDS to identify mothers with PPD, including role-playing scenarios.
- 12:30 PM - 1:30 PM: Lunch Break
- 1:30 PM - 3:00 PM: Training on taking anthropometrical measurements (weight and height of infants), including demonstration and practice sessions.
- 3:00 PM - 3:15 PM: Recap and Q&A session.

Day 2: Data Collection Tools and Techniques

- 9:00 AM - 10:30 AM: Introduction to effective interviewing techniques for collecting information on breastfeeding practices and socio-demographic factors.
- 10:30 AM - 10:45 AM: Tea Break
- 10:45 AM - 12:30 PM: Practice sessions for administering the breastfeeding practices questionnaire and socio-demographic factors questionnaire, with feedback provided.
- 12:30 PM - 1:30 PM: Lunch Break
- 1:30 PM - 3:00 PM: Review of ethical considerations and confidentiality protocols.
- 3:00 PM - 3:15 PM: Recap and Q&A session.

Day 3: Practice and Finalization

- 9:00 AM - 10:30 AM: Hands-on practice sessions for administering the EPDS, breastfeeding practices questionnaire, and socio-demographic factors questionnaire.
- 10:30 AM - 10:45 AM: Tea Break
- 10:45 AM - 12:30 PM: Final Q&A session to address any remaining questions or concerns.
- 12:30 PM - 1:30 PM: Recap, feedback, and conclusion of training.