PREVALENCE AND FACTORS ASSOCIATED WITH POSTPARTUM DEPRESSION AMONG WOMEN ATTENDING ARUSHA LUTHERAN MEDICAL CENTRE IN ARUSHA, TANZANIA BETWEEN DECEMBER 2021 AND MARCH 2022. A DESCRIPTIVE CROSS SECTIONAL STUDY.

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF MEDICINE (OBSTETRICS AND GYNAECOLOGY) IN THE DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY, UNIVERSITY OF NAIROBI

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Contents

DECLARATION

I declare that this dissertation is my original work and has not been presented by any other student for a degree award in any other University.

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LIST OF ABREVIATIONS

EPDS- Edinburgh Postnatal Depression Scale

PHQ- Patient Health Questionnaire

MINI- Mini International Neuro-Psychiatric Interview

BDI II- Beck Depression Inventory-II

GHQ-12 -General Health Questionnaire-12

PDSS- Postpartum Depression Screening Scale

PRQ- Pregnancy Risk Questionnaire

CES-D- Center for Epidemiological Studies Depression

DASS- Depression Anxiety Stress Scales

PRAMS- Pregnancy Risk Assessment Monitoring System

PPD- Postpartum Depression

ACOG- American College of Obstetrics and Gynecology

ANC- Antenatal Clinic

PNC- Postnatal Clinic

ALMC- Arusha Lutheran Medical Centre

KNH- Kenyatta National Hospital

UoN- University of Nairobi

PDSS- Postpartum Depression Screening Scale

SPSS- Statistical Package for Social Sciences

WHO World Health Organization

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ABSTRACT

Background: Postpartum depression is a non-psychotic mood disorder whose onset is within 4-6 weeks and up to 12 months after childbirth. 10-15% of women are affected by postpartum depression globally. PPD is associated with significant effects on child growth and development as well as infant-mother relationship. Postpartum depression diminishes a woman's ability to function effectively, interferes with her parenting and may lead to cognitive bias. A mother's ongoing depression can also contribute to her child cognitive, behavioral, emotional and interpersonal relationships later in life. Prevention, timely identification and treatment of postpartum depression is paramount.

Broad objective: To determine the prevalence and factors associated with postpartum depression among women attending Arusha Lutheran Medical Centre postnatal clinic between December, 2021 and March, 2022.

Study design: Descriptive cross sectional study.

Setting: Post natal clinic at Arusha Lutheran Medical Centre.

Study population: 289 consenting women attending postnatal clinic at ALMC, six weeks after delivery.

Study period: December 2021 to March 2022

Methods: Participants were recruited from ALMC postnatal clinic. Eligible participants were approached and requested to consent for participation. Consecutive sampling technique was used until the required sample size was attained. Data was collected using pre structured questionnaires and EPDS and analyzed using SPSS software.

Results: 300 postnatal women were recruited into this study but only 289 were analyzed, 11 were excluded because of incomplete data. Prevalence of postpartum depression among women attending ALMC postnatal clinic was 12.1%. Factors associated with postpartum depression included being single (OR (95% CI) 5.5 (2.1 – 14.4) p=0.001), having less than four antenatal visits (OR (95% CI) 2.5 (1.2 – 5.4) p=0.016), unplanned pregnancy (OR (95% CI) 4.7 (2.2 – 9.7) p<0.001), gestational age at delivery between 28-33weeks (OR (95% CI) 3.3 (1.2 – 9.2) p=0.023), neonatal admission (OR (95% CI) 2.3 (1.1 – 4.9) p=0.030), having a previous history of PPD (OR (95% CI) 2.3 7.3 (2.3 – 23.1) p=0.001), experiencing domestic violence (OR (95% CI) 5.1 (1.6 – 16.5) p=0.007), having inadequate relationship with partner (OR (95% CI) 13.4 (5.5 – 32.6) p<0.001), inadequate relationship with in-laws (OR (95% CI) 4.1 (1.6 – 10.4) p=0.003), having inadequate support during pregnancy (OR (95% CI) 6.1 (2.1 – 17.2) p=0.001), inadequate support during delivery (OR (95% CI) 8.8 (2.9 – 26.9) p<0.001), inadequate support after delivery (OR (95% CI) 5.9 (1.7 – 19.6) p=0.004), substance abuse by partner (OR (95% CI) 4.6 (1.3 – 16.4) p=0.021) and alcohol abuse by partner (OR (95% CI) 3.5 (1.1 – 12.1) p=0.046). Statistically significant factors after multivariate analysis included being single, unplanned pregnancy, previous history of PPD and inadequate relationship with partner.

Conclusion and Recommendation: Postpartum depression was found to be 12.1%. Routine screening for postpartum depression during the six week postnatal visit is recommended.

CHAPTER ONE: INTRODUCTION

1.1 Background to the study

Postpartum depression is a major depressive disorder whose onset is within four weeks following delivery (1). Up to 50% of cases of postpartum depression begin prior to delivery thus collectively termed as peripartum episodes (1). The International Classification of Disease however recognizes the onset of postpartum depression to be within six weeks postpartum (2). However, in clinical practice and research, the onset of postpartum depression has been found to occur up to one year after delivery (3). Postpartum depression should be distinguished from postpartum "blues" that is a brief period of emotional disturbance characterized by insomnia, anxiety, tearfulness, dysphoria, irritability, and mood lability in the first days after delivery and normally resolves by 10 days (2, 3).Postpartum "blues" have been shown to increase the risk of postpartum depression (1, 3). Moreover, normal physiological changes occurring in pregnancy and postpartum period may make it difficult to distinguish between the onset of depression and normal symptoms such as insomnia, loss of appetite and low energy (2).

It has been theorized that, dramatic decrease in steroid hormones i.e. cortisol, progesterone and estradiol after delivery dysregulate the neurotransmitters (serotonin and dopamine) pathway causing postpartum blues and depression in some women (3).

Postpartum depression can present with or without psychotic features (1). Postpartum depression with psychotic features occurs in from 1 in 500 to 1 in 1000 deliveries, more in primipara women and may be accompanied with profound delusions and hallucinations (1).

Women with postpartum depression present with signs and symptoms similar to major depressive disorder including ; Depressed mood, diminished interest or pleasure, significant

weight loss or weight gain, sleep disturbances, agitation, fatigue or loss of energy, feeling unworthy or guilty, suicide ideation, and decreased concentration and ability to think (1).

Generally the risk factors for postpartum depression include primiparity, prior postpartum mood episodes, family history of bipolar disorder, prior history of depressive or bipolar disorder (1, 3, 4 5). Other risk factors include poor partner or marital relationship, inadequate social support, negative life events, unplanned pregnancy, history of miscarriage, illness, assisted births, being single and difficult infant temperament (1, 3, 4, 5).

Postpartum depression can be screened using various tools such as the EPDS, BDI II, and PDSS with very high accuracy (6). EPDS is commonly used as it is easy to administer and has been proven to have a high sensitivity and specificity at a cutoff point of 11 or more (26).

CHAPTER TWO: LITERATURE REVIEW

2.1 Literature review

2.1.1 Prevalence of Postpartum depression

In high income countries, postpartum depression is very common with a prevalence rate of 7% to 13% (3, 4). In comparison to high income countries, less is known about the prevalence rate of postpartum depression in low- and middle-income countries (4). There is also a significant heterogeneity in prevalence in different regions of low- and middle-income countries (4). In Africa, the prevalence rate ranges from 7.1% to 33% (4). In South America, the prevalence rate ranges from 16% to 50% (4). These variations make it difficult to assess the extent of postpartum depression burden in low- and middle-income countries (4).

From a study done by Qobadi et al in 2016 on the effects of stressful life events on postpartum depression that included 3697 women at 6 weeks postpartum using PRAMS questionnaire found a 14.8% prevalence rate (7). Lanes et al in 2011 in Canada included 6421 women at 6 weeks postpartum using EPDS, and found the national prevalence rate of PPD to be 8.69% (8).

On the other hand, a study done by Kari Glavin RN in 2009 on the magnitude of PPD in Norway and included 2227 women using EPDS at 6 weeks postpartum found a 10.1% prevalence rate (9). Zaidi et al in 2018 looked at the association of postpartum and antenatal depression amongst women in New Delhi, India and included 149 women at 6 postpartum week using EPDS, and found the prevalence of 12.75% (10).

Another study in India by Modi VP et al in 2018 on “The prevalence of postpartum depression and correlation with risk factors”, that included 250 women at 1-6 weeks postpartum using EPDS found the prevalence of 20.4% (11). Moreover, Nimisha et al also in India, in 2012

included 200 women up to 1 year postpartum", using DSM-IV TR diagnostic criteria, and found 12.5% prevalence rate (12). In Vietnam, Kim Ly Do et al in 2018 found the prevalence of PPD to be 27.6% in a study that included 116 women during the first year postpartum using EPDS (13).

In Egypt, Wassif et al in 2019 assessed anxiety and postpartum depression and included 500 women at 2 and 4 month postpartum using DASS-42 and found that 1.6% and 10% had postpartum depression and anxiety respectively, and 21.2% suffered from both (14). Anokye et al in 2018 in Ghana included 256 women within 12 months postpartum using PHQ-9 and found a 7% prevalence rate of postpartum depression (15).

Additionally, in 2019, a study by Abebe et al that evaluated postpartum depression in Bahir Dar town, Ethiopia and included 511 women within 6 months postpartum using the EPDS tool found a 22.1% prevalence of postpartum depression (16). However, a year later in 2020 in Ethiopia, a study by Melkamu et al that included 526 women at 6 weeks postpartum found 25% prevalence rate (17).

Nakku et al in 2007 looked at postpartum major depression in Kampala, Uganda and included 544 women at 6 weeks postpartum using MINI found the prevalence of postpartum depression to be 6.1% (18). Furthermore, Madeghe et al in Nairobi, Kenya, in 2016 used EPDS tool to screen for postpartum depression and assessed infant feeding practices in 200 mother-infant pairs and found a 13% prevalence rate of PPD (19). In addition to this, Musau et al studied postpartum depression at Kenyatta National Hospital in 2013 using the EPDS tool and included 183 postnatal women at 6 weeks postpartum found the prevalence of PPD to be 10.6% (24). Moreover, a study by Tuitoek in 2020 evaluated the postpartum depression among 381 women at

6 weeks postpartum in Nakuru Level Five Hospital, Kenya, used the EPDS tool and found a prevalence of 11.3% (25).

In Tanzania, a study by Mbarak et al in 2019 evaluating the prevalence of postpartum depression among 390 women with preeclampsia/eclampsia at 4 weeks postpartum using EPDS found a prevalence of 20.5% (20). Moreover, an unpublished study by Msigwa in 2010 evaluated depressive symptoms and associated factors among 309 mothers at 4 weeks to 1 year postpartum at Sinza and Magomeni health facilities in Kinondoni municipality, Dar es Salaam, Tanzania using SONONA questionnaire, found a prevalence of 17.2% (21). In addition to this, a study Holm-Larsen CE et al evaluating postpartum depression and child growth among1128 mother-child pair at 40 days postpartum in Tanzania using EPDS found that 12.2% of mothers had postpartum depression (22).

In conclusion, the reviewed studies have shown heterogeneity of the prevalence rate that may be explained by their differences in study sites, screening tools used, sample size studied and the timing of screening post-delivery.

2.1.2 Risk factors associated with postpartum depression.

Several studies have yielded conflicting results in the association between parity and postpartum depression, with some citing primiparity as a risk factor for postpartum depression (9, 13) and others, particularly in India and Tanzania, citing multiparity as a risk factor for the same (12, 21). Young age has also been associated with postpartum depression (11, 18 20). However, a different study done in Norway showed that an age of more than 36 years is associated with postpartum depression (9). A poor support system as well as a poor relationship with one's partner/spouse, in-laws or friends, and domestic violence have also been associated with

postpartum depression (7, 8, 11, 12, 13, 20, 21). A low financial gain has likewise been related to an augmented risk for postpartum depression (7, 11, 14, 19, 24).

Studies have shown that a history of miscarriages and (12, 17, 21), unplanned pregnancy (16, 17, 18), newborn hospitalization and perinatal death (16, 20, 21) are also associated with postpartum depression

Other risk factors include: an unwanted sex of the baby, having a girl child and pressure to deliver a male child (11, 12, 18), negative life events, or stress (7, 16, 18)

Prior diagnosis of anxiety or PPD, history of antidepressants use, personal and family history of psychiatric illness have been strongly associated with PPD (8, 11, 14)

2.1.3 Screening for postpartum depression.

There are several tools available for depression screening which can be divided into those specific to detect postpartum/peripartum maternal depression and general depression screening tools (27). Specific postpartum/peripartum maternal depression screening tools include the EPDS, the PDSS and the PRQ while general depression screening tools includes the BDI-II, the GHQ-12, the CES-D, and the PHQ versions 2, 8, and 9 (27).

From a 2018 postpartum depression screening tool review by Ukatu et al, the author concluded that there is no screening tool that is superior to the rest in accurately detecting postpartum depression and that there is no recommendation of time duration to screen for postpartum depression. However, the author highlighted that screening for PPD during the first 4 weeks after delivery may be in accordance to the DSM-V modifier of major depression but may also be associated with lower sensitivity and specificity than later months screening. In addition,

immediate postpartum screening may miss women with a slow onset of postpartum depression (27).

However, shorter, easily administered screening tools such as EPDS and PHQ-9 are recommended by the ACOG committee opinion (28)

EPSD has been validated for use in Ethiopia with specificity of 75.3% and sensitivity of 78.9% as well as in Sudan with sensitivity of 89% and specificity 82% (16, 23). The EPDS consists of 10 self-reported questions, takes less time, has been translated in multiple languages and is easy to score (28). The EPDS assesses anxiety symptoms, and excludes constitutional symptoms of depression that are commonly experienced in pregnancy and the postpartum period (28). Tools such as PHQ-9, BDI, and CES-D include these constitutional symptoms and thus reduces their specificity for perinatal depression (28). In addition the other tools excluding the PHQ-9 and the EPDS, have 20 or more questions and, thus, requiring more time to complete and to score (28).

2.1.4 Treatment for postpartum depression.

Treatment modalities for postpartum depression includes psychotherapy and pharmacotherapy (3). Psychotherapy includes general counselling, interpersonal psychotherapy, cognitive behavioral therapy and psychodynamic therapy (3). Pharmacotherapy involves various antidepressant drugs such as paroxetine, venlafaxine, fluoxetine, nefazodone, and nortriptyline (3). Women prefer psychotherapy to pharmacotherapy (3). There is lack of evidence on whether pharmacotherapy outperform psychotherapy (3).

Moreover, Reindolf et al found that psychosocial support, professional based home visits after delivery, cognitive therapy, and interpersonal psychotherapy were the most utilized postpartum depression management interventions (15).

2.1.5 Complications of postpartum depression

Postpartum depression diminishes the ability of the women to effectively function in many aspects of their lives, as well as interfering with their parenting leading to negative child outcome (3). Postpartum depression has also been shown to increase the level of negative emotionality while decreasing positive emotionality (3). Women with postpartum depression exhibit cognitive biases leading to negative personal perception and others such as their infants (3). Moreover, women with postpartum depression tend to neglect and abuse their children more (3).

Early childhood to adolescence behavioral problems have been linked to postpartum depression as well as effects on child cognitive development such as language and intelligence quotient (IQ) (3).

In addition, postpartum depression has been shown to affect children's physical health such that children are more likely to have poor cardiovascular functioning, higher rate of lower respiratory tract infections, and gastrointestinal infections (3). Children of women with PPD are also more likely to have growth issues such as stunting and being underweight (22).

2.2 CONCEPTUAL FRAMEWORK

2.2.1 Narrative for the Conceptual Framework

In this proposed study, the analyzed dependent variable will be postpartum depression and the independent variables will include;

- Socio-demographic factors such as age, marital status, education, employment, income, religion and address.
- Obstetric factors such as ANC visits, parity, route of delivery, gestation age at delivery, neonatal outcome, neonatal admission, pregnancy related complications, delivery related complications, desired sex of the baby, planned pregnancy, history of miscarriages, pattern of miscarriages and number of miscarriages.
- Past personal and family history of psychiatric illnesses; previous history of postpartum depression, and past psychotropic drug use
- Social factors: domestic violence, relationship with partner, in-laws, parents or friends, support during pregnancy, delivery and after delivery, negative life event and substances abuse by partner.

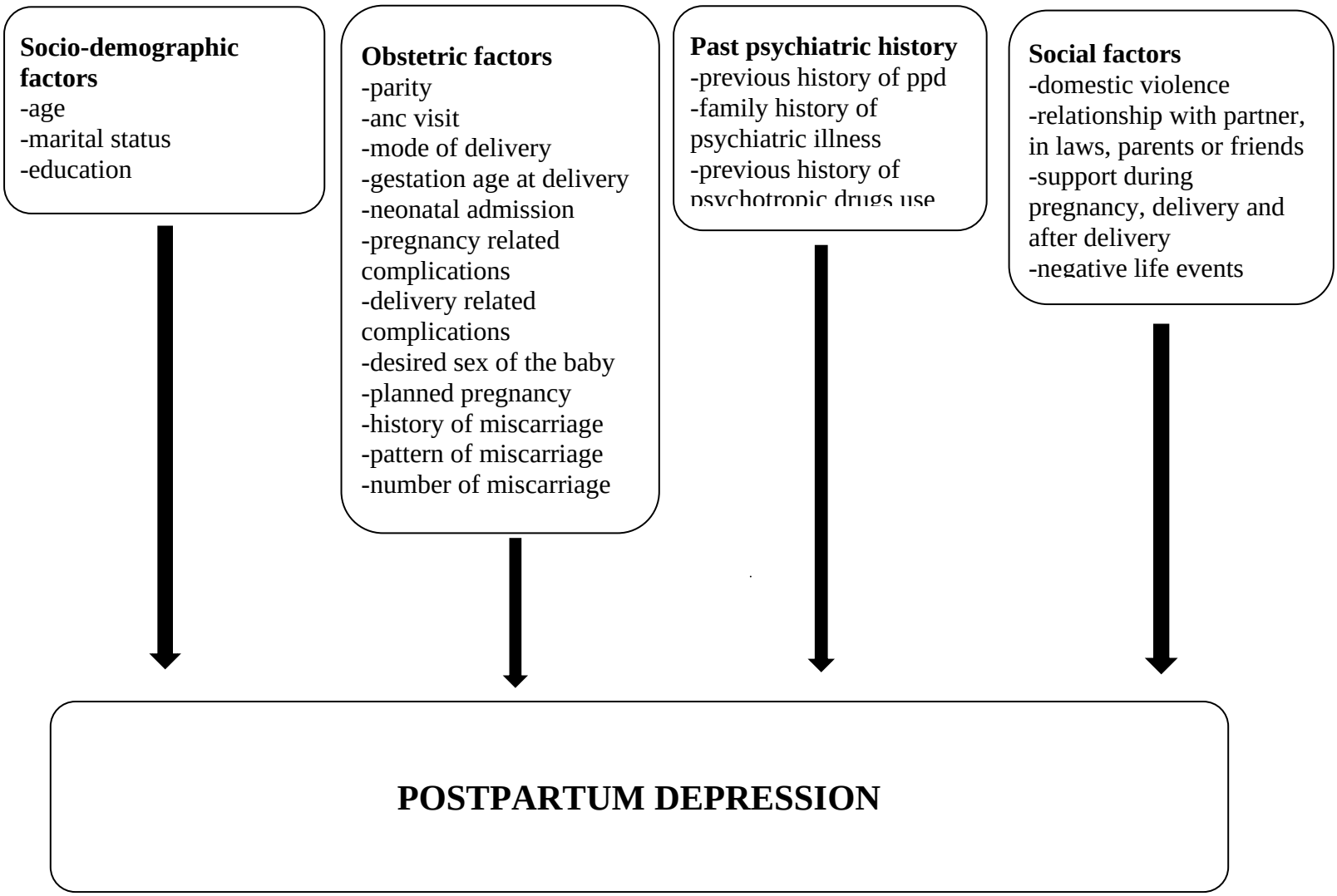

Figure 1: A diagrammatic representation of the relationship between socio-demographic factors, obstetric factors, social factors, past psychiatric history and postpartum depression.

2.3 JUSTIFICATION

Postpartum depression is one of the major public health problem. Unidentified and untreated maternal depression has negative effects on the mother, infant development as well as infant and mother bonding.

There is paucity of published studies on postpartum depression in Tanzania. Despite the fact that postpartum depression is one of the major public health problem, there is not a mention of it in a Tanzanian National Standard Treatment Guideline.

Some of international guidelines advise routine screening for postpartum depression for all women during a comprehensive postnatal care. There is no known hospital in Tanzania that has adopted screening for postpartum depression. This may be due to few published studies on postpartum depression that describe the awareness, magnitude and effects of postpartum depression in the country.

This study looked at the prevalence and factors associated with postpartum depression in Arusha. It is our belief that, the results of this study will reflect the magnitude of postpartum depression in northern part of Tanzania. It will also act as a foundation to reflect the magnitude of postpartum depression in Tanzania at large.

The results of this study will also act as a basis for advocacy for maternal mental health. It will also help to push for postpartum depression to be included in the national standard treatment guideline which will improve awareness to all maternal health care providers in Tanzania.

The results of this study will also prompt other high powered studies on the effects, management and prevention of postpartum depression in Tanzania.

2.6 RESEARCH QUESTION

What is the prevalence and factors associated with postpartum depression among women attending Arusha Lutheran Medical Centre postnatal clinic between December, 2021 and March, 2022?

2.7 RESEARCH OBJECTIVES

2.7.1 BROAD OBJECTIVE

To determine the prevalence and factors associated with postpartum depression among women attending Arusha Lutheran Medical Centre postnatal clinic between December, 2021 and March, 2022.

2.7.2 SPECIFIC OBJECTIVES

Among women attending the postnatal clinic at Arusha Lutheran Medical Centre at six weeks postpartum

i. To determine the prevalence of postpartum depression.
ii. To determine the factors associated with postpartum depression.

CHAPTER THREE: METHODOLOGY

3.1 STUDY DESIGN

Descriptive Cross Sectional study.

There are few published studies in Tanzania on the magnitude, and awareness of postpartum depression. Therefore, this study was chosen to shed a light on the magnitude of postpartum depression in Northern part of Tanzania and Tanzania at large.

3.2 STUDY AREA AND SETTING:

This study was conducted at Arusha Lutheran Medical Centre (ALMC). ALMC is the private regional referral hospital located along Makao Mapya road in Arusha, Tanzania. The hospital has several departments such as obstetrics and gynecology, surgery, internal medicine and pediatric and child health departments. The department of Obstetrics and Gynecology provides specialized and general obstetrics and gynecology services including antenatal and postnatal clinics, delivery services, and gynecology services. The department has two full time consultants and 2 medical officers. The department has an average of 1500 deliveries annually with 98% of them attending three follow ups at 1, 3 and 6 postpartum week respectively at the postnatal clinic. On average of 100 women attend the post-natal clinic every month. ALMC was well suited for this study because it has one of the best obstetric departments in Northern Tanzania. It serves women of all socio-economic status. Moreover, it is among the facilities in Arusha that properly follows up postpartum women until the end of puerperium (i.e. 6 weeks post-delivery) which makes it easy to identify postpartum complications when they occur. The department also works in partnership with a clinical psychologist who foresees maternal mental health issues. Moreover, there is no any previous research on postpartum depression that has been done in Arusha.

3.3 STUDY POPULATION

3.3.1 INCLUSION CRITERIA

i. Postpartum women attending ALMC postnatal clinic at six weeks after delivery.

3.3.2 EXCLUSION CRITERIA

i. Postpartum women below and above six weeks after delivery.

ii. Postpartum women who decline to consent for the study.

3.4 SAMPLE SIZE AND SAMPLING PROCEDURE

Sample size will be calculated using the formula (30)

$$n = \frac{Z^2 x\ P(1-P)}{d^2}$$

Where,

n = Desired sample size

Z = value from standard normal distribution corresponding to desired confidence level (Z=1.96 for 95% CI)

P = expected true proportion (estimated at 25.0%, from a study conducted by **Melkamu et al (2020)** in Gondar town in Ethiopia; that looked at the prevalence and predictor of postpartum depression and found 25.0% of the women had postpartum depression)

d = desired precision (0.05)

$$n_0 = \frac{1.96^2 x\ 0.25(1-0.25)}{0.05^2} = 289$$

The sample size used was 289. However, to account for attrition ($n_0 + 10\%\ (n_0)$, a sample size of 318 was required, but 300 participants were recruited, 11 participants were excluded due to incomplete data hence the 289 sample size.

Consecutive sampling technique was used.

3.5 DATA VARIABLES

Table 1: Study Variables

DEPENDENT VARIABLES	INDEPENDENT VARIABLES
• Postpartum depression (Yes/No)	• Socio-demographic factors: age, marital status, education, employment, income, religion, address • Obstetric factors: ANC visits, parity, route of delivery, gestation age at delivery, neonatal outcome, neonatal admission, pregnancy related complications, delivery related complications, desired sex of the baby, planned pregnancy, history of miscarriages, pattern of miscarriages, number of miscarriages • Psycho-socio factors: previous history of ppd, family history of psychiatric illness, previous history of psychotropic drugs use, domestic violence, relationship with partner, in laws, parents or friends, support during pregnancy, delivery and after delivery, negative life event, substances abuse by partner

3.6 DATA COLLECTION AND MANAGEMENT

Three research assistants that included a medical officer and two registered nurses were taken through the study and trained on the different terminologies and the process of filling the questionnaires in a standardized manner.

Data was collected using two questionnaires i.e. questionnaire A and B. The questionnaire A consisted of questions on socio-demographic characteristics, obstetric characteristics and psychosocial characteristics. The questionnaire B consists of English/Swahili version of EPDS. All women at six weeks postpartum attending the postnatal clinic were approached and explained about the study. 300 eligible women consented for the study, were identified using study numbers and interviewed by research assistants who filled Questionnaire A. Questionnaire B were filled by participants.

The research assistants then assessed the questionnaires for completion and handed them over to the lead research assistant.

Filled questionnaires were be kept in A4 envelopes and stored in a very secure office that was only accessed by the principal investigator and the lead research assistant. The data was finally entered by the principal investigator and analyzed by both the principal investigator and statistician. Only 289 questionnaires were analyzed after excluding 11 questionnaires with incomplete data.

3.7 DATA ANALYSIS METHODS

Data collected was checked for completeness and free from errors prior to entry into Microsoft Excel 2017 spreadsheet. The data was later exported to the SPSS version 23.0. After analysis of clinical and demographic characteristics of the patients, data that are categorical were presented as percentages and frequencies while those that are continuous were presented as medians with interquartile range or as means with standard deviations. The prevalence of postpartum depression among postpartum women attending ALMC postnatal clinic was calculated as a proportion of those that score ≥ 13 on the EPDS tool over the total sample size and presented as a percentage. Univariate analysis of selected patient factors with the dependent outcome postpartum depression were analyzed with the use of Pearson Chi-square, and factors found to be significant were subjected to multivariate analysis with the use of logistic regression. Odds ratio with 95% confidence was calculated and presented where appropriate. A p-value of < 0.05 was considered statistically significant for all statistical tests.

3.8 RESEARCH ETHICS

Ethical clearance was obtained from KNH-UoN ethics and research committee. Clearance to conduct this research was also obtained from Arusha Lutheran Medical Centre's director of clinical services as well as head of obstetrics and gynecology department.

Reasons for the research was explained to the participants and informed consent was explained in simple Swahili and obtained. Only consented postpartum women who will met the inclusion criteria were included. Postpartum women who were not willing to participate were not forced to do so. No personal identifiers were to be included and obtained data was kept confidential.

Measures were taken to prevent the spread of coronavirus among participants and research assistants.

Women who were found to have postpartum depression were be referred in-house clinical psychologist. Only 5 participant who screened positive for PPD agreed to see the clinical psychologist. The lead research assistant kept in contact with referred women found to have postpartum depression in order to make sure that they have been evaluated and managed. The participants who screened positive for PPD were encourage to follow-up at postnatal clinic for further counselling by the obstetricians.

Data results will be presented as a requirement for completion of postgraduate studies. Data will also be shared with the director of clinical services (ALMC) and head of Obstetrics and Gynecology department (ALMC). The data results will also be shared with the Arusha District Medical Officer in-charge. A manuscript will also be prepared for publication.

3.9 STUDY STRENGTHS AND LIMITATIONS

3.9.1 STRENGTH

i. The use of a validated screening tool (EPDS) improved data's validity and reliability

3.9.2 LIMITATION

i. Despite being translated by native Swahili speakers, EPDS Swahili translation may reduce its originality.
ii. Subjective assessment of quality of relationship rather than using validated instrument such as relationship assessment scale.

CHAPTER FOUR: RESULTS

4.10 RESULTS

Of 300 participants recruited into the study, 289 were analyzed. 11 were excluded due to missing data. Among the 289, 36.0% (104) were between the ages of 26-30 years. The mean age of the patients was 28.9 (SD 5.2) years, where the minimum age was 14.0 years, and the maximum age was 43.0 years. The median age was 29.0 (IQR 25.0 – 32.0) years.

91.3% (264) were Christians, 66.8% (193) lived in urban setting, 92.7% (268) were married, 42.2% (122) had tertiary level of education, 40.8% (118) were self-employed and 55.7% (161) were earning below monthly minimum wage.

Table 2: Baseline characteristics of women attending ALMC postnatal clinic at six weeks postpartum December 2021- March 2022.

	Frequency	Percent
Age		
≤20	14	4.8
21-25	63	21.8
26-30	104	36.0
31-35	80	27.7
>35	28	9.7
Religion		
Christian	264	91.3
Muslim	25	8.7
Residence		
Urban	193	66.8
Rural	96	33.2
Marital status		
Single	21	7.3
Married	268	92.7
Education		
Primary level	81	28.0
Secondary level	86	29.8
Tertiary level	122	42.2
Employment		
Unemployed	74	25.6
Self employed	118	40.8
Formal employed	97	33.6
Monthly income		
Below minimum wage (270,000 Tsh)	161	55.7
Above minimum wage (270,000 Tsh)	128	44.3

Table 3: Prevalence of Post-partum Depression among women attending ALMC postnatal clinic at six weeks postpartum December 2021- March 2022.

	Frequency *(n=289)*	**Percent**
PPD Present	35	12.1 (95% CI, 8.8% - 16.4%)
PPD Absent	254	87.9

Of the 289 participants, 35 participants scored ≥13 on the EPDS. Thus, the prevalence of PPD was 12.1%.

Table 4: Association of Socio-demographic factors with PPD among women attending ALMC postnatal clinic at six weeks postpartum December 2021- March 2022.

	PPD Present	**PPD Absent**	**OR (95% CI)**	**p-value**
Age				
≤20	3 (8.6)	11 (4.3)	1.3 (0.3 – 6.2)	0.781
21-25	4 (11.4)	59 (23.2)	0.3 (0.1 – 1.3)	0.103
26-30	11 (31.4)	93 (36.6)	0.5 (0.2 – 1.7)	0.300
31-35	12 (34.3)	68 (26.8)	0.8 (0.3 – 2.6)	0.721
>35	5 (14.3)	23 (9.1)	Reference	
Religion				
Christian	32 (91.4)	232 (91.3)	1.0 (0.3 – 3.6)	0.986
Muslim	3 (8.6)	22 (8.7)	Reference	
Residence				
Urban	24 (68.6)	169 (66.5)	1.1 (0.5 – 2.3)	0.811
Rural	11 (31.4)	85 (33.5)	Reference	
Marital status				
Single	8 (22.9)	13 (5.1)	5.5 (2.1 – 14.4)	**0.001**
Married	27 (77.1)	241 (94.9)	Reference	
Education				
Primary level	15 (42.9)	66 (26.0)	2.1 (0.9 – 4.7)	0.079
Secondary level	8 (22.9)	78 (30.7)	0.9 (0.4 – 2.4)	0.898
Tertiary level	12 (34.3)	110 (43.3)	Reference	
Employment				
Unemployed	10 (28.6)	64 (25.2)	1.5 (0.6 – 4.0)	0.385
Self employed	16 (45.7)	102 (40.2)	1.5 (0.6 – 3.6)	0.332
Formal employed	9 (25.7)	88 (34.6)	Reference	
Monthly income				
Below minimum wage	25 (71.4)	136 (53.5)	2.2 (1.0 – 4.7)	0.050
Above minimum wage	10 (28.6)	118 (46.5)	Reference	

The less than 20 year old had 1.3 greater odds of having PPD than the reference age of above 35 years, while the other age groups in comparison to the reference age of above 35 years were less likely to have PPD, but these associations were not statistically significant.

On religion, Christians had the same odds as Muslims to exhibit PPD, and this was not statistically significant. Those living in urban settings when compared to the Rural had 1.1 greater odds of having PPD, but was not statistically significant. The single mothers had 5.5 greater odds of having PPD than those married, and this was statistically significant. On education those with primary level had 2.1 greater odds of having PPD when compared to tertiary level of education, while those with secondary had less odds of having PPD when compared to tertiary educated, but these were not statistically significant. For employment, the unemployed and self-employed each had 1.5 greater odds of having PPD when compared to the formally employed. Those with monthly income below the minimum wage had 2.2 greater odds of having PPD when compared to those earning above the minimum wage, but this also was not statistically significant.

Table 5: Association of Obstetric characteristics factors and PPD among women attending ALMC postnatal clinic at six weeks postpartum December 2021- March 2022.

	PPD Present	PPD Absent	OR (95% CI)	p-value
Parity				
1	9 (25.7)	79 (31.1)	Reference	
2-4	23 (65.7)	163 (64.2)	1.2 (0.5 – 2.8)	0.607
≥5	3 (8.6)	12 (4.7)	2.2 (0.5 – 9.3)	0.285
Number of ANC visits				
<4	13 (37.1)	48 (18.9)	2.5 (1.2 – 5.4)	**0.016**
≥4	22 (62.9)	206 (81.1)	Reference	
Planned pregnancy				
Yes	17 (48.6)	207 (81.5)	Reference	
No	18 (51.4)	47 (18.5)	4.7 (2.2 – 9.7)	**<0.001**
Mode of delivery				
SVD	23 (65.7)	159 (62.6)	1.2 (0.5 – 2.4)	0.721
CS	12 (34.3)	95 (37.4)	Reference	
Gestational age at delivery				
28-33	6 (17.1)	15 (5.9)	3.3 (1.2 – 9.2)	**0.023**
34-36	2 (5.7)	16 (6.3)	1.0 (0.2 – 4.7)	0.967
≥37	27 (77.1)	223 (87.8)	Reference	
Desired sex of baby				
Yes	25 (71.4)	206 (81.1)	Reference	
No	10 (28.6)	48 (18.9)	1.7 (0.8 – 3.8)	0.184
Neonatal outcome				
Live birth	35 (100)	248 (97.6)	-	
Perinatal death	0 (0)	6 (2.4)		
Neonatal admission				
Yes	13 (37.1)	52 (20.5)	2.3 (1.1 – 4.9)	**0.030**
No	22 (62.9)	202 (79.5)	Reference	
Pregnancy related complications				
Yes	6 (17.1)	21 (8.3)	2.3 (0.9 – 6.2)	0.099
No	29 (82.9)	233 (91.7)	Reference	
Delivery related complications				
Yes	6 (17.1)	23 (9.1)	2.1 (0.8 – 5.5)	0.145
No	29 (82.9)	230 (90.9)	Reference	

History of miscarriage				
Yes	6 (17.1)	39 (15.4)	1.1 (0.4 – 2.9)	0.785
No	29 (82.9)	215 (84.6)	Reference	

Grand multiparas had 2.2 greater odds of having PPD than primiparas while multiparas had 1.2 greater odds of having PPD than primiparas but this was not statistically significant. Women who attended less than 4 anc visits had 2.5 greater odds of having PPD than those who attended 4 or more anc visits and this was statistically significant. Women who did not plan their pregnancy had 4.7 greater odds of having PPD than women who planned their pregnancies and this was also statistically significant.

Women who delivered by spontaneous vaginal delivery had 1.2 greater odds of having PPD than those who delivered by cesarean section but this was not statistically significant. Women who delivered between 28 to 33 weeks gestation had 3.3 greater odds of having PPD than those who delivered at 37 weeks or more gestation and this was statistically significant. Women who delivered between 34 to 36 weeks gestation and those who delivered at 37 weeks or more gestation were equally likely to have PPD.

Moreover, women who did not desire the sex of their baby had 1.7 greater odds of having PPD than those who desired the sex of their baby but this was not statistically significant. Women whose babies were admitted to newborn unit had 2.3 greater odds of having PPD than those whose babies were not admitted to newborn unit and this was statistically significant.

However, women who had pregnancy related complications had 2.3 greater odds of having PPD than those who did not have any pregnancy related complications but this was not statistically significant. Women who had complications during delivery had also 2.1 greater odds of having PPD than those who did not have delivery related complications and this was not statistically

significant. Women with history of miscarriage had 1.1 greater odds of having PPD than those without any history of miscarriage but this was not statistically significant as well.

Table 6: Association of Psychosocial characteristics factors and PPD among women attending ALMC postnatal clinic at six weeks postpartum December 2021- March 2022.

	PPD Present	PPD Absent	OR (95% CI)	p-value
Previous history of PPD				
Yes	6 (17.1)	7 (2.8)	7.3 (2.3 – 23.1)	**0.001**
No	29 (82.9)	246 (97.2)	Reference	
Family history of Psychiatric illness				
Yes	0 (0)	4 (1.6)	-	
No	35 (100)	249 (98.4)		
Previous history of Psychotropic drug use				
Yes	1 (2.9)	1 (0.4)	7.4 (0.5 – 121.3)	0.160
No	34 (97.1)	252 (99.6)	Reference	
Domestic violence				
Yes	5 (14.3)	8 (3.2)	5.1 (1.6 – 16.5)	**0.007**
No	30 (85.7)	244 (96.8)	Reference	
Relationship with partner				
Adequate	21 (60.0)	241 (95.3)	Reference	
Inadequate	14 (40.0)	12 (4.7)	13.4 (5.5 – 32.6)	**<0.001**
Relationship with in-laws				
Adequate	27 (77.1)	236 (93.3)	Reference	
Inadequate	8 (22.9)	17 (6.7)	4.1 (1.6 – 10.4)	**0.003**
Relationship with parents				
Adequate	32 (91.4)	247 (97.6)	Reference	
Inadequate	3 (8.6)	6 (2.4)	3.9 (0.9 – 16.2)	0.065
Support during pregnancy				
Adequate	28 (80.0)	243 (96.0)	Reference	
Inadequate	7 (20.0)	10 (4.0)	6.1 (2.1 – 17.2)	**0.001**
Support during delivery				
Adequate	28 (80.0)	246 (97.2)	Reference	
Inadequate	7 (20.0)	7 (2.8)	8.8 (2.9 – 26.9)	**<0.001**
Support after delivery				
Adequate	30 (85.7)	246 (97.2)	Reference	
Inadequate	5 (14.3)	7 (2.8)	5.9 (1.7 – 19.6)	**0.004**
Substance abuse by partner				
Yes	4 (11.4)	7 (2.8)	4.6 (1.3 – 16.4)	**0.021**
No	31 (88.6)	247 (97.2)	Reference	
Alcohol abuse by partner				
Yes	4 (11.4)	9 (3.5)	3.5 (1.1 – 12.1)	**0.046**
No	31 (88.6)	245 (96.5)	Reference	
Negative life events				
Yes	4 (11.4)	16 (6.3)	1.9 (0.6 – 6.1)	0.270
No	31 (88.6)	238 (93.7)	Reference	

Moreover, women with history of PPD had 7.3 greater odds of having PPD than those without history of PPD and this was statistically significant. Women with previous history of psychotropic drug use had 7.4 greater odds of having PPD than those without the history of psychotropic drug use but this was not statistically significant.

Women who suffer from domestic violence had 5.1 greater odds of having PPD than those who were not suffering from domestic violence and this was statistically significant. Women who with inadequate relationship with their partners had 13.4 greater odds of having PPD than those who with adequate relationship with their partners and this was statistically significant. In addition, women with inadequate relationship with their in-laws had 4.1 greater odds of having PPD than those with adequate relationship with their in-laws and this was statistically significant.

Women with inadequate relationship with their parents had 3.9 greater odds of having PPD than those with adequate relationship with their parents but this was not statistically significant. Women who had inadequate support during pregnancy had 6.1 greater odds of having PPD than those who had adequate support during pregnancy and this was statistically significant. Women who had inadequate support during delivery had 8.8 greater odds of having PPD than those who had adequate support during delivery and this was statistically significant. Moreover, women who have inadequate support after delivery had 5.9 greater odds of having PPD than those who have adequate support after delivery and this was statistically significant.

Women whose partners have substance abuse problem had 4.6 greater odds of having PPD than those whose partners do not have substance abuse problem and this was statistically significant. Women whose partners abuse alcohol had 3.5 times greater odds of having PPD than those whose partners do not abuse alcohol and this was statistically significant. Women who had

experience negative life events had 1.9 greater odds of having PPD than those who did not have any negative life events but this was not statistically significant.

Table 7: Significant factors associated with PPD among women attending ALMC postnatal clinic at six weeks postpartum December 2021- March 2022 after multiple logistic regression analysis.

	PPD Present	PPD Absent	cOR (95% CI)	p-value	aOR (95% CI)	p-value
Marital status						
Single	8 (22.9)	13 (5.1)	5.5 (2.1 – 14.4)	**0.001**	8.5 (2.6 – 27.5)	**<0.001**
Married	27 (77.1)	241 (94.9)	Reference		Reference	
Planned pregnancy						
Yes	17 (48.6)	207 (81.5)	Reference		Reference	
No	18 (51.4)	47 (18.5)	4.7 (2.2 –9.7)	**<0.001**	5.1 (2.2 11.6)	**<0.001**
Previous history of PPD						
Yes	6 (17.1)	7 (2.8)	7.3 (2.3 – 23.1)	**0.001**	11.9 (3.4 – 42.3)	**<0.001**
No	29 (82.9)	246 (97.2)	Reference		Reference	
Relationship with partner						
Adequate	21 (60.0)	241 (95.3)	Reference		Reference	
Inadequate	14 (40.0)	12 (4.7)	13.4 (5.5 – 32.6)	**<0.001**	18.0 (4.7 – 69.0)	**<0.001**

On further analysis using multiple logistic regression, single women had 8.5 greater odds of having postpartum depression than married women and this was statistically significant. Women who did not plan their pregnancy had 5.1 greater odds of having postpartum depression than women who planned their pregnancy. Moreover, women who reported previous history of PPD had 11.9 greater odds of having postpartum depression than women who did not report previous history of PPD. Women with inadequate relationship with their partners had 18 greater odds of having postpartum depression than those who reported adequate relationship with their partners.

4.20 DISCUSSION

4.21 Prevalence of postpartum depression

In this study the prevalence of postpartum depression at 6 weeks was 12.1%. This prevalence rate is comparable to studies done regionally in Kenya, and Tanzania which reported prevalence rate of PPD to be 13%, 12.2%, 10.6% and 11.3% (19, 22, 24, 25). However, studies in Ghana and Uganda reported low prevalence rate of 7% and 6% respectively (15, 18)

On the other hand, studies done in Ethiopia reported high prevalence rate of 22.1% and 25% respectively (16, 17). The variations in the prevalence rates may be methodological due to differences in the timing of postpartum screening, screening tools used, study design as well as cultural identity and diversity (24, 25)

4.22 Risk factors associated with postpartum depression

In this study, being single, having less than four antenatal visits, unplanned pregnancy, gestational age at delivery between 28-33weeks, neonatal admission, having a previous history of PPD, experiencing domestic violence, having inadequate relationship with partner and in-laws, having inadequate support during pregnancy, delivery and after delivery, substance abuse by partner and alcohol abuse by partner were factors statistically associated with PPD.

Single women had 5.5 greater odds of having PPD than married women. This result compares well to the studies done in Uganda, Kenya and Tanzania (18, 19 20). The study in Uganda reported that single women were 2.5 greater odds to having PPD (18). Moreover, a study in Tanzania showed that being single increased eightfold risk for PPD (20). This may be explained by the fact that our society still expects women to only get pregnant after marriage. Women who get pregnant before marriage may face rejection from family and friends. This may isolate the

woman, make her feel unworthy and struggle to go through pregnancy alone. Some single mothers face rejection from partners as well as get pregnant from sexual assault.

This study also found that the odds of having PPD was 2.5 times in women who attended less than 4 antenatal clinic visits than those who attended four or more anc visits. This finding is not comparable to any study that we have reviewed, but no antenatal clinic visit was fourfold associated with PPD in a study done in Ethiopia (17).

In this study, women who did not plan their pregnancy had 4.7 greater odds of having PPD than women who planned their pregnancies. This finding is comparable to studies done in Ethiopia and Uganda. Unplanned pregnancy was about two times risky for PPD in studies done in Ethiopia (16, 17). Women who did not plan their pregnancy had 3 greater odds of having PPD in a study done in Uganda (18).

The odds to having PPD in women who delivered between 28-33 weeks gestation was about 3.3 in this study. This finding is likely comparable to the study done in Ethiopia that showed that the odds of developing PPD was three times in women who delivered babies with less than 2.5kg and two times in women who delivered before 36 weeks gestation (17).

Women whose neonates were admitted had 2.3 greater odds of having PPD in the current study. This finding can be compared to a study done in Ethiopia where mothers who had their babies hospitalized had 2.7 greater odds of having PPD (16). Women with a previous history of PPD had 7.3 greater odds of having PPD in this study. The finding is in agreement with a study done in Egypt that showed that women with positive history of PPD had 2.56 greater odds of having PPD (14).

In this study, women who experience domestic violence had 5.1 greater odds of having PPD. This finding is comparable to a study done in India whereby improper attachment to the partner was a risk for having PPD (11). Moreover, a study done in Ethiopia showed that intimate partner violence increases the risk for PPD by three-fold (16).

Women who reported inadequate relationship their partners had 13.4 greater odds of having PPD in this study. This finding can be compared to a study done in India that showed women with poor relationship with their partners had 10.3 times higher odds of having PPD (12). Moreover, women who reported inadequate relationship with their in-laws had 4 greater odds of having PPD. This is comparable to a study done in India that also showed inadequate relationship with in-laws increased risk for PPD (11).

In the current study, women with inadequate support during pregnancy, delivery and after delivery had 6.1, 8.8 and 5.9 greater odds of having PPD respectively. This result can be compared to studies done in Canada and Tanzania (8, 20). In the Tanzanian study, lack of family support increased risk for PPD by sevenfold (20).

This study also found that women who reported substance abuse by their partners had 5.9 greater odds of having PPD. This finding was not comparable to any study that we reviewed. Moreover, women whose partner abused alcohol had 3.5 greater odds of having PPD and this result was comparable by a study done in India that reported that husband taking alcohol increased risk for PPD but his was not statistically significant (11).

Furthermore, multiple regression analysis excluded having less than four antenatal visits, gestational age at delivery between 28-33weeks, neonatal admission, experiencing domestic violence, and in-laws, having inadequate support during pregnancy, delivery and after delivery,

substance abuse by partner and alcohol abuse by partner as significant factors but being single, unplanned pregnancy, previous history of PPD and having inadequate relationship with partner remained significantly associated with PPD.

4.30 CONCLUSION AND RECOMMENDATIONS

4.31 conclusion

This study found the prevalence of postpartum depression to be 12.1%. Statistically significant factors associated with postpartum depression included being single, having less than four antenatal visits, unplanned pregnancy, gestational age at delivery between 28-33weeks, neonatal admission, having a previous history of PPD, experiencing domestic violence, having inadequate relationship with partner and in-laws, having inadequate support during pregnancy, delivery and after delivery, substance abuse by partner and alcohol abuse by partner.

4.32 Recommendations

i. Routine screening for postpartum depression in all women during the six week postnatal visit. Postpartum depression discussion should be a part of preconception and antenatal counselling.
ii. Postpartum depression should be included in Tanzania National Standard Treatment Guideline, this will increase awareness of postpartum depression among health workers and the community at large.
iii. High powered studies to assess causal effect relationship between risk factors (such as inadequate relationship with partner) and postpartum depression using validated tools

5.10 STUDY TIMELINE

Table 8: Study Timeline

	May-August 2021	September 2021	September-December 2021	December 2021- March 2022	April 2022
Proposal development					
Proposal presentation					
Ethic committee review					
Data collection and analysis					
Results presentation					

5.20 BUDGET

Table 9: Study Budget.

Budget item	**Cost of item**	**No of item (s)**	**Total cost(s) KSH**
KNH-UON ERC Submission	2000		2000
Printing/copying		4460 pages	15000
Research assistants (3)			30000
Transport			18000
Statistician			35000
Total			**100000**

This study was a self-funded study. The printing/copying costs is per Arusha current prices.

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APPENDIX

Data collection tools

QUESTIONNAIRE A

Study Number…….

Date of delivery ……

A: Socio-demographic characteristics

i. Age……

ii. Where do you live?

   a. Urban ☐

   b. Rural ☐

iii. Marital status

   a. Single ☐

   b. Married ☐

   c. Separated ☐

   d. Widowed ☐

   e. Cohabiting ☐

iv. Religion

   a. Christian ☐

   b. Muslim ☐

   c. Others ☐

v. Education level

a. No formal education ☐

b. Primary level ☐

c. Secondary level ☐

d. Tertiary level ☐

vi. Employment status

a. Unemployed ☐

b. Self-employed ☐

c. Formal employed ☐

vii. Monthly income

a. Below minimum wage (270,000 Tsh) ☐

b. Above minimum wage (2700,000 Tsh) ☐

B: Obstetric characteristics

i. Parity

a. 1 ☐

b. ≥ 2 ☐

c. ≥ 5 ☐

ii. Did you attend antenatal clinic?

a. Yes ☐, if yes number of visits…….

b. No ☐

iii. Did you plan for this pregnancy?

a. Yes ☐

b. No ☐

iv. Mode of delivery

a. Spontaneous vaginal delivery ☐

b. Cesarean section delivery ☐

c. Assisted vaginal delivery ☐

v. Gestational age at delivery…….

vi. Is the sex of your baby as you desired?

a. Yes ☐

b. No ☐

vii. Neonatal outcome

a. Live birth ☐

b. Perinatal death ☐

viii. Neonatal admission

a. Yes ☐

b. No ☐

ix. Pregnancy related complications

a. Yes ☐, if yes state…….

b. No ☐

x. Delivery related complications

a. Yes ☐

b. No ☐

xi. History of miscarriages

a. Yes ☐ if yes proceed to xii and xiii

b. No ☐

xii. Pattern of miscarriages

a. Spontaneous ☐

b. Induced ☐

xiii. Number of miscarriages……

C: Psychosocial characteristics

i. Previous history of postpartum depression?

a. Yes ☐

b. No ☐

ii. Family history of psychiatric illness

a. Yes ☐ if yes state…….

b. No ☐

iii. Previous history of psychotropic drugs use

a. Yes ☐

b. No ☐

iv. Do you experience any domestic violence?

a. Yes ☐

b. No ☐

v. Relationship with partner

a. Adequate ☐

b. Inadequate ☐

vi. Relationship with in-laws

a. Adequate ☐

b. Inadequate ☐

vii. Relationship with parents

a. Adequate ☐

b. Inadequate ☐

viii. Support during pregnancy

a. Adequate ☐

b. Inadequate ☐

ix. Support during delivery

a. Adequate ☐

b. Inadequate ☐

x. Support after delivery

a. Adequate ☐

b. Inadequate ☐

xi. Substance abuse by partner

a. Yes ☐

b. No ☐

xii. Alcohol abuse by partner

a. Yes ☐

b. No ☐

xiii. Have you recently experienced any negative life events?

a. Yes ☐ if yes state…….

b. No ☐

QUESTIONNARE B

Edinburgh Postnatal Depression Scale (EPDS)

Study Number……

Please place a check ☒ on the box by the answer that come closest to how you have felt for the past 7 days, not just how you feel today.

Tafadhali weka alama ya ☒ katika jibu ambalo liko karibu zaidi na jinsi ambavyo umekuwa ukijisikia katika siku 7 zilizopita, na sio tu jinsi unavyojisikia leo.

1. I have been able to laugh and see the funny side of things:
    a. As much as I always could ☐ (0)
    b. Not quite so much now ☐ (1)
    c. Definitely not so much now ☐ (2)
    d. Not at all ☐ (3)

1. *Nimeweza kucheka na kuona jambo la kuchekesha katika mambo*
    a. *Kadri niwezavyo kila siku ☐ (0)*
    b. *Kwa kiasi fulani si wakati wote ☐ (1)*
    c. *Sio sana ☐ (2)*
    d. *Hapana hata kidogo ☐ (3)*

2. I have looked forward with enjoyment to things:
    a. As much as I ever did ☐ (0)
    b. Rather less than I used to ☐ (1)
    c. Definitely less than I used to ☐ (2)
    d. Hardly at all ☐ (3)

2. *Nimetarajia mambo kwa furaha*
    a. *Kwa kiasi nilichoweza ☐ (0)*
    b. *Kidogo kuliko nilivyofanya zamani ☐ (1)*
    c. *Kwa hakika ni kidogo sana kuliko nilivyofanya zamani ☐ (2)*
    d. *Hata kidogo ☐ (3)*

3. I have blamed myself unnecessarily when things went wrong:
    a. Yes, most of the time ☐ (3)
    b. Yes, some of the time ☐ (2)
    c. Not very often ☐ (1)
    d. No, never ☐ (0)

3. *Nimejilaumu bila sababu wakati mambo yalipoenda vibaya*
    a. *Ndio, mara nyingi sana ☐ (3)*
    b. *Ndio, mara nyingi kiasi ☐ (2)*

c. *Sio sana ☐ (1)*
d. *Hakuna kabisa ☐ (0)*

4. I have been anxious or worried for no good reason:
    a. No, not at all ☐ (0)
    b. Hardly ever ☐ (1)
    c. Yes, sometimes ☐ (2)
    d. Yes, very often ☐ (3)

4. Nimekuwa na wasiwasi bila sababu nzuri
    a. Hapana, hakuna kabisa ☐ (0)
    b. Hapana, sio sana ☐ (1)
    c. Ndio, mara nyingine ☐ (2)
    d. Ndio, mara nyingi sana ☐ (3)

5. I have felt scared or panicky for no good reason:
    a. Yes, quite a lot ☐ (3)
    b. Yes, sometimes ☐ (2)
    c. No, not much ☐ (1)
    d. No, not at all ☐ (0)

5. Nimeshikwa na woga au hofu bila sababu njema
    a. Ndio, mara nyingi sana ☐ (3)
    b. Ndio, mara nyingine ☐ (2)
    c. Hapana, sio sana ☐ (1)
    d. Hapana, hakuna kabisa ☐ (0)

6. Things have been getting to me:
    a. Yes, most of the time I haven't been able to cope at all ☐ (3)
    b. Yes, sometimes I haven't been coping as well as usual ☐ (2)
    c. No, most of the time I have coped quite well ☐ (1)
    d. No, I have been coping as well as ever ☐ (0)

6. Mambo yamekuwa yakinilemea
    a. Ndio, mara zote nimeshindwa kuvumilia kabisa ☐ (3)
    b. Ndio, kuna wakati nimeshindwa kuvumilia ☐ (2)
    c. Hapana, mara zote kuvumilia vizuri ☐ (1)
    d. Hapana, mara zote nimevumilia kama ilivyo kawaida ☐ (0)

7. I have been so unhappy that I have had difficulty sleeping:
    a. Yes, most of the time ☐ (3)
    b. Yes, sometimes ☐ (2)
    c. No, not very often ☐ (1)
    d. No, not at all ☐ (0)

7. Nimekuwa na huzuni sana hadi nimekuwa na ugumu kupata usingizi

a. Ndio, mara nyingi sana ☐ (3)

b. Ndio, mara nyingine ☐ (2)

c. Hapana, sio sana ☐ (1)

d. Hapana, hakuna kabisa ☐ (0)

8. I have felt sad or miserable:
    a. Yes, most of the time ☐ (3)
    b. Yes, quite often ☐ (2)
    c. Not very often ☐ (1)
    d. No, not at all ☐ (0)

8. Nimesikia huzuni sana na kutokua na furaha

a. Ndio, mara nyingi sana ☐ (3)

b. Ndio, mara nyingi kiasi ☐ (2)

c. Sio sana ☐ (1)

d. Hapana, hakuna kabisa ☐ (0)

9. I have been so unhappy that I have been crying:
    a. Yes, most of the time ☐ (3)
    b. Yes, quite often ☐ (2)
    c. Only occasionally ☐ (1)
    d. No, never ☐ (0)

9. Sijakuwa na furaha kabisa hadi nimetokwa na machozi

a. Ndio, mara nyingi sana ☐ (3)

b. Ndio, mara nyingi kiasi ☐ (2)

c. Mara chache sana ☐ (1)

d. Hapana kabisa ☐ (0)

10. The thought of harming myself has occurred to me:
    a. Yes, quite often ☐ (3)
    b. Sometimes ☐ (2)
    c. Hardly ever ☐(1)
    d. Never ☐ (0)

10. Nimekuwa na mawazo ya kujitendea mabaya

a. Ndio, mara nyingi sana ☐ (3)
b. Mara nyingine ☐ (2)
c. Kwa nadra sana ☐ (1)
d. Hakuna kabisa (0)

Total score……..

Thank you for completing this survey

Dummy Tables

Table 1: A table showing the prevalence of Post-partum Depression

	Frequency	Percent
PPD Present		
PPD Absent		

Table 2. A table showing the socio-demographic characteristics of postpartum women attending ALMC PNC

Variable	Category	PPD Present	PPD Absent	OR (95% CI)	p-value
Age in years	18-23				
	24-29				
	30-35				
	36-41				
	42-47				
	>47				
Religion	Christianity				
	Islam				
	Others				
Address	Urban				

	Rural
Marital status	Single
	Married
	Separated
	Widowed
Education	No formal education
	Primary level
	Secondary level
	Tertiary level
Employment	Unemployed
	Self employed
	Formal employed
Income per month	Below minimum wage (240000 Tsh/month)

Above

minimum wage

(240000

Tsh/month)

Table 3. A table showing the obstetric characteristics of postpartum women attending ALMC PNC

Variable	Category	PPD Present	PPD Absent	OR (95% CI)	p-value
Parity	Primipara				
	Multipara				
	Grand multipara				
ANC Visit	Yes				
	No				
Planned pregnancy	Yes				
	No				
Mode of delivery	Spontaneous vaginal				
	Cesarean section				
	Assisted vaginal				
Gestational age at delivery	$28\text{-}33^{6/7}$				
	$34\text{-}36^{6/7}$				
	$37\text{-}41^{6/7}$				
	$42\text{-}42^{6/7}$				
	Yes				

Desired sex of the baby	No
Neonatal outcome	Live birth
	Perinatal death
Neonatal admission	Yes
	No
Pregnancy related complications	Yes
	No
Delivery related complications	Yes
	No
History of miscarriages	Yes
	No
Pattern of miscarriages	Spontaneous
	Induced
Number of miscarriages	1
	≥ 2

Table 4. A table showing the psychosocial characteristics of postpartum mothers attending ALMC PNC

Variable	Category	PPD Present	PPD Absent	OR (95% CI)	p-value
Previous history of ppd	Yes				
	No				
Family history of psychiatric illness	Yes				
	No				
Previous history of psychotropic drugs use	Yes				
	No				
Domestic violence	Yes				
	No				
Relationship with partner	Adequate				
	Not adequate				
Relationship with in-laws	Adequate				
	Not adequate				
Relationship with parents	Adequate				
	Not adequate				
Support during pregnancy	Adequate				
	Not adequate				
Support during delivery	Adequate				

	Not adequate
Support after delivery	Adequate
	Not adequate
Substance abuse by partner	Yes
	No
Alcohol abuse by partner	Yes
	No
Negative life events	Yes
	No

INFORMED CONSENT

PARTICIPANT INFORMATION AND CONSENT FORM
FOR ENROLLMENT IN THE STUDY

Title of Study: Prevalence and factors associated with postpartum depression among women attending ALMC postnatal clinic between December, 2021 and March, 2022.

Principal Investigator/and institutional affiliation: Dr Fredy Mrema/ University of Nairobi

Co-Investigator(s) and institutional affiliation:

_____

Introduction:

I would like to tell you about a study being conducted by the above listed researcher. The purpose of this consent form is to give you the information you will need to help you decide whether or not to be a participant in the study. Feel free to ask any questions about the purpose of the research, what happens if you participate in the study, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When we have answered all your questions to your satisfaction, you may decide to be in the study or not. This process is called 'informed consent'. Once you understand and agree to be in the study, I will request you to sign your name on this form. You should understand the general principles which apply to all participants in a medical research: i) Your decision to participate is entirely voluntary ii) You may withdraw from the study at any time without necessarily giving a reason for your withdrawal iii) Refusal to participate in the research will not affect the services you are entitled to in this health facility or other facilities. We will give you a copy of this form for your records.

May I continue? YES / NO

This study has approval by The Kenyatta National Hospital-University of Nairobi Ethics and Research Committee protocol no. _____

WHAT IS THIS STUDY ABOUT?

The researchers listed above are interviewing individuals who are **6 weeks post-delivery**. The purpose of the interview is to find out **the magnitude of depression among postpartum women**. As a participants in this research study you will be asked questions about **yourself, your last pregnancy, and how you and your baby are doing.** Participants will also have to fill **a depression screening questionnaire**. There will be approximately **318** participants in this study randomly chosen. We are asking for your consent to consider participating in this study.

WHAT WILL HAPPEN IF YOU DECIDE TO BE IN THIS RESEARCH STUDY?

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

You will be interviewed by a trained interviewer in a private area where you feel will comfortable answering questions. The interview will last approximately 10 minutes.

After the interview is finished, you will then be given a depression screening questionnaire to fill.

We will ask for a telephone number where we can contact you if necessary. If you agree to provide your contact information, it will be used only by people working for this study and will never be shared with others. The reasons why we may need to contact you include being referred for further evaluation if you are found to have depression.

ARE THERE ANY RISKS, HARMS DISCOMFORTS ASSOCIATED WITH THIS STUDY?

Medical research has the potential to introduce psychological, social, emotional and physical risks. Effort should always be put in place to minimize the risks. One potential risk of being in the study is loss of privacy. We will keep everything you tell us as confidential as possible. We will use a code number to identify you in a password-protected computer database and will keep all of our paper records in a locked file cabinet. However, no system of protecting your confidentiality can be absolutely secure, so it is still possible that someone could find out you were in this study and could find out information about you.

Also, answering questions in the interview may be uncomfortable for you. If there are any questions you do not want to answer, you can skip them. You have the right to refuse the interview or any questions asked during the interview.
We will do everything we can to ensure that this is done in private. Furthermore, all study staff and interviewers are professionals with special training in these interviews.

ARE THERE ANY BENEFITS BEING IN THIS STUDY?

You may benefit by knowing if you may have depression. We will refer you to a clinical psychologist for care and support where necessary. Also, the information you provide will help us better understand about depression after delivery. This information is a contribution to science and is a part of requirement for completion of my postgraduate degree.

WHAT IF YOU HAVE QUESTIONS IN FUTURE?

If you have further questions or concerns about participating in this study, please call or send a text message to the study staff at the number provided at the bottom of this page.
For more information about your rights as a research participant you may contact the Secretary/Chairperson, Kenyatta National Hospital-University of Nairobi Ethics and Research Committee Telephone No. 2726300 Ext. 44102 email uonknh_erc@uonbi.ac.ke.
The study staff will pay you back for your charges to these numbers if the call is for study-related communication.

WHAT ARE YOUR OTHER CHOICES?

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

CONSENT FORM (STATEMENT OF CONSENT)

Participant's statement

I have read this consent form or had the information read to me. I have had the chance to discuss this research study with a study counselor. I have had my questions answered in a language that I understand. The risks and benefits have been explained to me. I understand that my participation

in this study is voluntary and that I may choose to withdraw any time. I freely agree to participate in this research study.

I understand that all efforts will be made to keep information regarding my personal identity confidential.

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

I agree to participate in this research study: Yes No

I agree to have my personal information preserved for later study: Yes No

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

Participant printed name:

_____

Participant signature / Thumb stamp _____ **Date** _____

Researcher's statement

I, the undersigned, have fully explained the relevant details of this research study to the participant named above and believe that the participant has understood and has willingly and freely given his/her consent.

Researcher's Name: _____ **Date**: _____

Signature

_____

Role in the study: _____ *[i.e. study staff who explained informed consent form.]*

For more information contact

Principal Investigator: Dr Fredy Mrema

Telephone: +255763397684/ +254750748688

KNH-UoN ERC

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