# Prevalence of Postpartum Depression and Associated Factors among Postpartum Mothers at the Tamale Teaching Hospital

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## ABSTRACT

Postpartum depression is a mental disorder that may affect both genders. Postpartum depression may include poor mood, impatience, fatigue, sleeplessness, hunger changes, worry, inability to cope, guilt, suicidal thoughts, and worthlessness. However, Ghana lacks epidemiological evidence on postpartum depression and its related causes. This study aimed at assessing the prevalence and associated risk factors of Postpartum depression (PPD) among new mothers at the Tamale Teaching Hospital (TTH). In April and May 2022, 135 postpartum mothers visiting the prenatal clinic at Tamale Teaching Hospital participated in a facility- based, analytical cross-sectional survey. Postpartum and Neonatal Intensive Care Unit registers were randomly sampled. Data gathering employed a structured questionnaire and the Edinburgh Postnatal Depression Scale. To look at postpartum predictors, descriptive, bivariate (using chi-square), and multivariable logistic regression analyses were used. According to the research, out of the 135 mothers, the majority of them were married (96%) with more than 10 household members, literate (78%) because most were urban residents (53%), Muslims (87%), traders (37%), and aged between 21 and 30. The study also revealed that almost one in ten (10.37 percent) of the respondents had Edinburgh Postnatal Depression Scale depressed symptoms scores classed as high. Finally, of all the socio-demographic, maternal, clinical, lifestyle, and psychological factors considered, only two variables were significantly linked with postpartum depression symptoms, which were pressure from immediate family or friends (AOR=13.18; CI=2.069-84.009; p=004) and daily hours of sleep during the postpartum period (AOR=0.745; CI=0.020-6.615; p=0.048). This study concludes that the incidence of depression symptoms among mothers at TTH is quite high. Despite the observed improvement, pressure from close ones and daily hours of sleep during the postpartum period were identified as risk factors for PPD. To treat postpartum depression among postpartum mothers, immediate interventions such as counseling and psychological assistance at home and in health facilities are required.

## INTRODUCTION

### Background of the study

An estimated 3.8% of the global population suffers from depression. This number rises to 5.0% among adults and 5.7% among individuals aged 60 and over (GBD Results, 2021). Globally, depression affects an estimated 280 million individuals (GBD Results, 2021). Clinical depression is distinct from the normal ups and downs of mood and from the fleeting emotions prompted by day-to-day stresses. Depression may be a significant health problem, especially if it occurs often and is either moderate or severe. The afflicted individual may experience significant distress and have impaired performance in their professional, academic, and interpersonal spheres. Suicide is a possible outcome of severe depression. More than 700,000 individuals worldwide take their own lives each year. For those aged 15–29, suicide ranks as the fourth highest cause of mortality (GBD Results, 2021).

More than 75% of persons with mental problems in poor and middle-income countries do not obtain treatment, even though there are recognized, effective therapies (Evans-Lacko et al., 2018). Social stigma, a dearth of skilled medical professionals, and an absence of necessary resources all work against providing adequate treatment for mental health conditions (Evans-Lacko et al., 2018). Many individuals who suffer from depression go undiagnosed, while many more who do not have the disease are given antidepressants because of a false positive diagnosis. This happens in nations of all financial levels.

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A depressive episode is characterized by a lack of pleasure or interest in activities, or by a depressed mood (feeling sad, irritated, or empty) that persists for the majority of the day, practically every day, for at least two weeks. Distraction from daily activities, excessive guilt or low self-worth, a lack of faith in the future, suicidal ideation, disturbed sleep, changes in eating or weight, and extreme fatigue or low energy may also be present (WHO, 2021).

Certain individuals may be more likely to show their emotions via physical manifestations in certain cultural settings (e.g., pain, fatigue, weakness). Yet these bodily signs cannot be attributed to any other disease or health problem. Significant impairment in personal, familial, social, educational, occupational, and/or other critical domains of functioning is experienced during a depressive episode. According on the individual's symptom profile and the extent to which it interferes with their daily life, a depressive episode may be classified as either mild, moderate, or severe (WHO, 2021).

Postpartum depression (PPD) is a complicated combination of physical, emotional, and behavioral changes that occurs in around 6.5 percent to 20 percent of women globally (Mughal, Azhar, and Siddiqui, 2021) and starts within 4 weeks following birth (Gedzyk-Nieman, 2021). The definition of Postpartum depression (PPD) is provided by two known diagnosis systems: The Diagnostic and Statistical Manual of Mental Disorders (DSM IV-TR; the International Statistical Classification of Diseases the International Statistical Classification of Diseases Related Health Problems (ISCD-H) as well as the American Psychological Association, 1994) (ICD-10; WHO, 1992). The DSM 5-TR identifies postpartum depression as a major mental disorder with PPD beginning and depicts that its symptoms begin within the first 4 weeks of the postpartum period (American Psychological Association [APA], 2015). However, the exact cause of postpartum depression is unknown (Meltzer- Brody, 2011).

Postpartum depression is most often diagnosed within six weeks after delivery. Postpartum depression (PPD) affects from 6.5 percent to 20% of females. It is particularly prevalent in female adolescents, moms who have preterm children, and women who reside in metropolitan areas ( Mughal et al., 2021). Postpartum depression affects around one in every seven women (PPD). While women suffering the baby blues often recover quickly, PPD is typically more prolonged and has a significant impact on women's capacity to return to regular function. PPD affects both the mother and the baby. PPD impairs the maternal brain's responsiveness and behavior. According to Beck (2006), up to half of PPD cases among new moms go untreated due to privacy concerns and a reluctance to report to close family members.

Additionally, there is a stigma associated with new moms, since revelation may result in desertion and fear of a lack of support (Zauderer, 2009).

Globally, 450 million individuals suffer from neurological and mental illnesses, making depression the fourth largest cause of disability and early mortality (World Health Organization [WHO], 2017). Despite worldwide awareness of the birthing issue, diagnosing and treating PPD has been neglected until recently (Anokye, Acheampong, Budu-Ainooson, Obeng, & Akwasi, 2018). Moreover, women underreport PPD in the clinical environment, which is influenced by socioeconomic and cultural variables (Coast et al., 2012). However, only 20% of mothers with PPD seek medical attention (WHO, 2017).

Although treatment is provided differently based on socio-demographic and cultural factors, determining prevalence and risk factors for PPD is challenging (Rashidul et al., 2019). Despite its maternal consequences, mothers and obstetric caregivers in low- and middle-income countries lack information about it (Ikeako et al., 2018).

The American Psychological Association estimates that 70% of postpartum mothers have a mood disorder. A study of 17 low- and middle-income nations showed 19.8% prevalence of PPD (Slomian et al., 2019). In Africa, one in ten women suffers from PPD (Fantahun et al., 2018).

Anokye et al. (2018) found that among 212 Ghanaian women, 93% exhibited no symptoms of PPD, whereas 7% did (PPD). Further research showed that 39% of respondents had mild depression, 22% had moderate depression and mild depression, respectively, 6% had fairly severe depression, and 11% had severe depression.

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In Ghana, many studies on postpartum care have focused on postpartum clinics or family planning services, rather than the prevalence and associated causes of PPD (Amankwaa, 2017). As a result, avoiding and diagnosing PPD in the early postpartum period is essential. The aim of this study is to assess postpartum depression prevalence and risk variables among new mothers at Tamale Teaching Hospital in the Northern Region.

Globally, it is estimated that 5% of individuals suffer from depression, which is also the largest cause of disability and makes a significant contribution to the global illness burden (WHO, 2022). Despite the dangers associated with PPD, only 15% of women throughout the world seek medical treatment for it (Brockington *et al.,* 2014).

Access to mental health and obstetric care is limited in Ghana (Amankwaa, 2017). This means that mothers' mental health is not taken care of during pregnancy and the time after giving birth. This has caused an increase in undiagnosed PPD, which the woman is left to deal with in silence until she relapses and gets to the stage of puerperal psychosis (Anokye *et al.,* 2018). Many societies in Ghana view women dealing with PPD as seeking undue attention, while others are termed "possessed and unreasonable" (Abeer & Hamza, 2014). Most women go through PPD in silence, and while others can deal with it by themselves, some women do not, and it even gets worse because they cannot get anybody to listen to them without being judgmental (Ikeako *et al.,* 2018). When women attend the postpartum clinic, obstetricians do not test for postpartum depression, focusing instead on the physical aspects of treatment such as breastfeeding instruction and personal cleanliness (Corrigan *et al.,* 2015). According to the researcher's search, previous studies in Ghana only focused on predictors and determinants of PDD but lacked good estimates of PPD prevalence and why PPD seems to be high in the northern part of Ghana (Wemakor & Mensah, 2016; Wemakor & Iddrisu, 2018; Anokye et al., 2018; Saeed & Wemakor, 2019) compared to studies done on postpartum mothers outside Northern Ghana (found lower rates of PPD; 3.8–11.3%) (Guo *et al.,* 2014; Okronipa *et al.,* 2012; Gold *et al.,* 2013; Weobong *et al.,* 2015; Weobong *et al.,* 2019). This shows a significant variation in the prevalence of postpartum depression among the two categories.

Furthermore, in the Northern Region, there have been only two community-based studies, with the rates of postpartum depression being 27.8% and 33.5 percent, respectively (Wemakor & Mensah, 2016; Wemakor & Iddrisu, 2018). Aside from this, there have not been any facility-based studies done in the Tamale Metropolis, which is the capital city of the Northern Region; hence, to help close the knowledge gap, this study seeks to determine the prevalence and associated factors of postpartum depression among postpartum women at Tamale Teaching Hospital.

Postpartum depression is a severe mental concern for most new mothers from many civilizations, yet it commonly remains unrecognized, mistreated, and not well documented. Insights gained from this Research will assist the Ministry of Health in enhancing policies and initiatives targeted at treating postpartum depression and related variables.

Evidence shows that treating a mother's depression improves neonatal development and growth and reduces the likelihood of diarrhea and malnutrition in children (Guo et al., 2013). It is only when a caregiver mother is psychologically healthy that she can provide appropriate child care techniques that promote optimal growth and development (Rahman et al., 2016). Also, understanding the prevalence and obstetric risk factors for PPD can assist caregivers and trainers in caring for and educating women before and after delivery. It will also contribute to current data and act as a baseline for future research on postpartum mental problems.

**Main objective**

This research study aims to assess the prevalence and associated risk factors of PPD among postpartum mothers at the Tamale Teaching Hospital.

**Conceptual framework**

The schematic depiction of the study's conceptual framework is shown in figure 1 above. It emphasizes the relationship between the study's dependent variable (*postpartum depression measured by EPDS* and the independent variables (socio-demographic factors, health systemic factors, and *associated risk factors*).

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Specifically, these factors demonstrate the level of prevalence among participants. The conceptual framework was designed in light of the study's research objectives and questions.

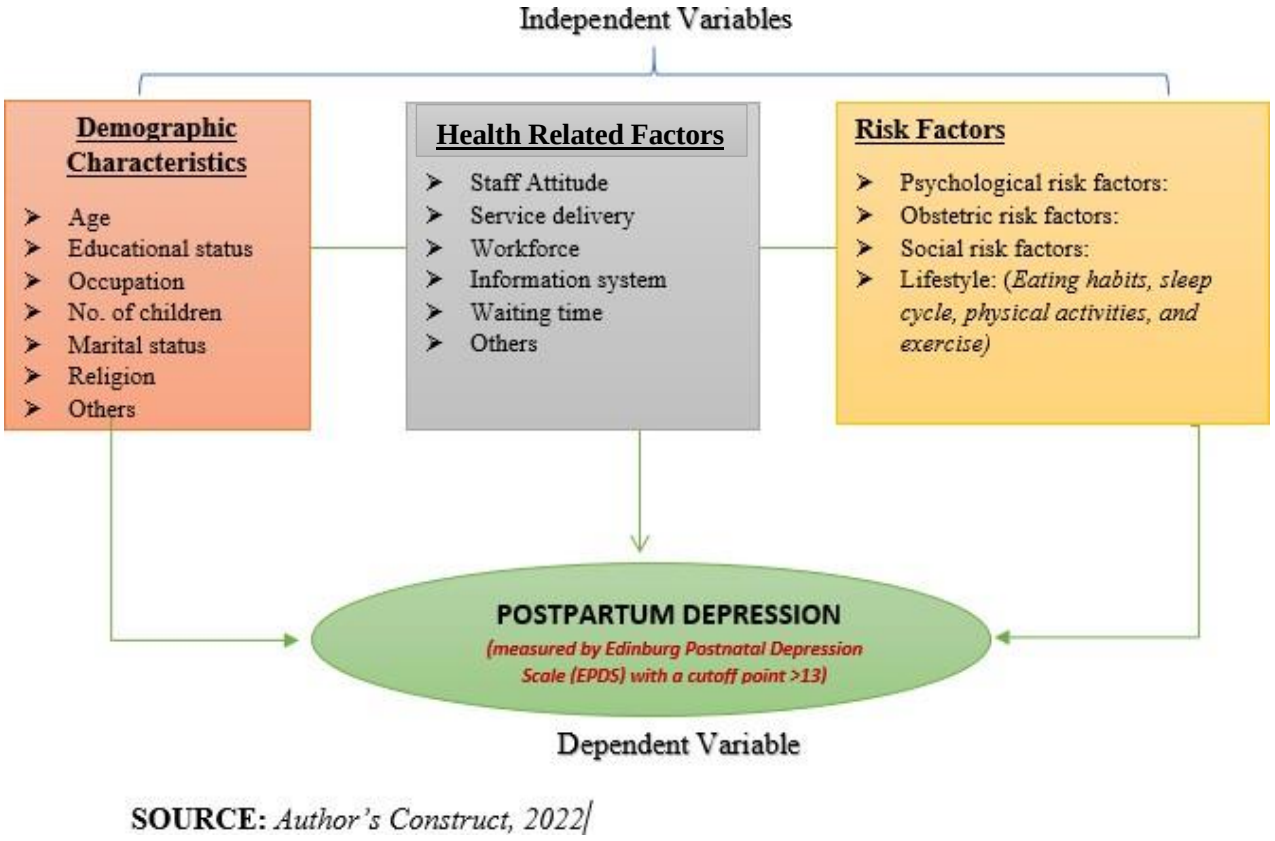


Figure 1: Illustration of the various practices and associated risk factors which affects postpartum depression among postpartum mothers.

**Organization of the study**

The study comprises six chapters, starting with chapter one, the introduction of the study, which comprises the background of the study, statement of the problem, general and specific objectives that guided the execution of the study, research questions, the justification of conducting the study, conceptual framework, and the organization of the study report. The second chapter, the literature review, is the review of works of other authors that are related to the objectives of the study and its predictive factors. The third chapter, the methodology, shows all the necessary procedures used and protocols followed to execute this study. This includes research design, study area, sources of data (primary/secondary), target population, sampling procedures, sample size, data collection tools, and analysis. Chapter four, results and discussions are the next, in which is presentations and explanation of the results. The last but one chapter is five, which is the general discussion of findings. The final chapter (the sixth) comprises the conclusion and recommendations

## STUDY AREA AND RESEARCH METHODOLOGY

**Profile of the Study Site -** *Tamale Teaching Hospital (TTH)*

The Tamale Teaching Hospital (TTH) was established in 1974 as the northern regional hospital to serve the people of the northern region and its environs. Additionally, it was to serve as the primary medical referral hospital for the Northern Sector of the nation, which encompassed the Upper East and West regions. The hospital was first situated on the grounds of the Old Central Hospital and was then transferred to its present location after the new hospital was constructed and commissioned in 1974 (TMA, 2022).

Since 2009, the hospital has been elevated to a Teaching Hospital, making it the only tertiary health center in the northern part of the country which comprise the Upper West and East regions, the Northern Region, savanna

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region, north east region, northern Volta, some areas of the Brong–Ahafo region, and the northern sections of the Volta region. Patients go from various regions of Togo and Burkina Faso to the hospital (Tamale Teaching Hospital, 2022).

Currently, the hospital has a bed capacity of 484 (four hundred and eighty-four). Each year, the Hospital treats around 100,000 patients. TTH is located on the eastern outskirts of Tamale Metropolis, on the main Tamale-Salaga Road, and has an area of about (490,000m$^2$) square meters (TTH, 2022).

The mission of the hospital is specified by Act 525 of the Ghana Health Service and Teaching Hospitals Act of 1996. The mission empowers the hospital to perform in three essential areas: advanced clinical health services, support for undergraduate and postgraduate medical education, and lastly, research into health concerns with the goal of enhancing health care.

In 2012, the hospital received a contribution of 335,000 Ghana cedis to establish a state-of-the-art Neonatal Intensive Care Unit (NICU). MTN Ghana contributed to the response to a need highlighted by Lord Paul Boateng and his wife during a 2011 visit to the hospital. As of July 2015, the completed units can accommodate forty neonates and their mothers. Additionally, it provides office space and locations for students to study. The hospital arranged for a separate power connection from Akosombo to ensure a continuous power supply (TTH, 2022). See figure 2 below for the map of the Tamale metropolis, indicating the location of TTH.

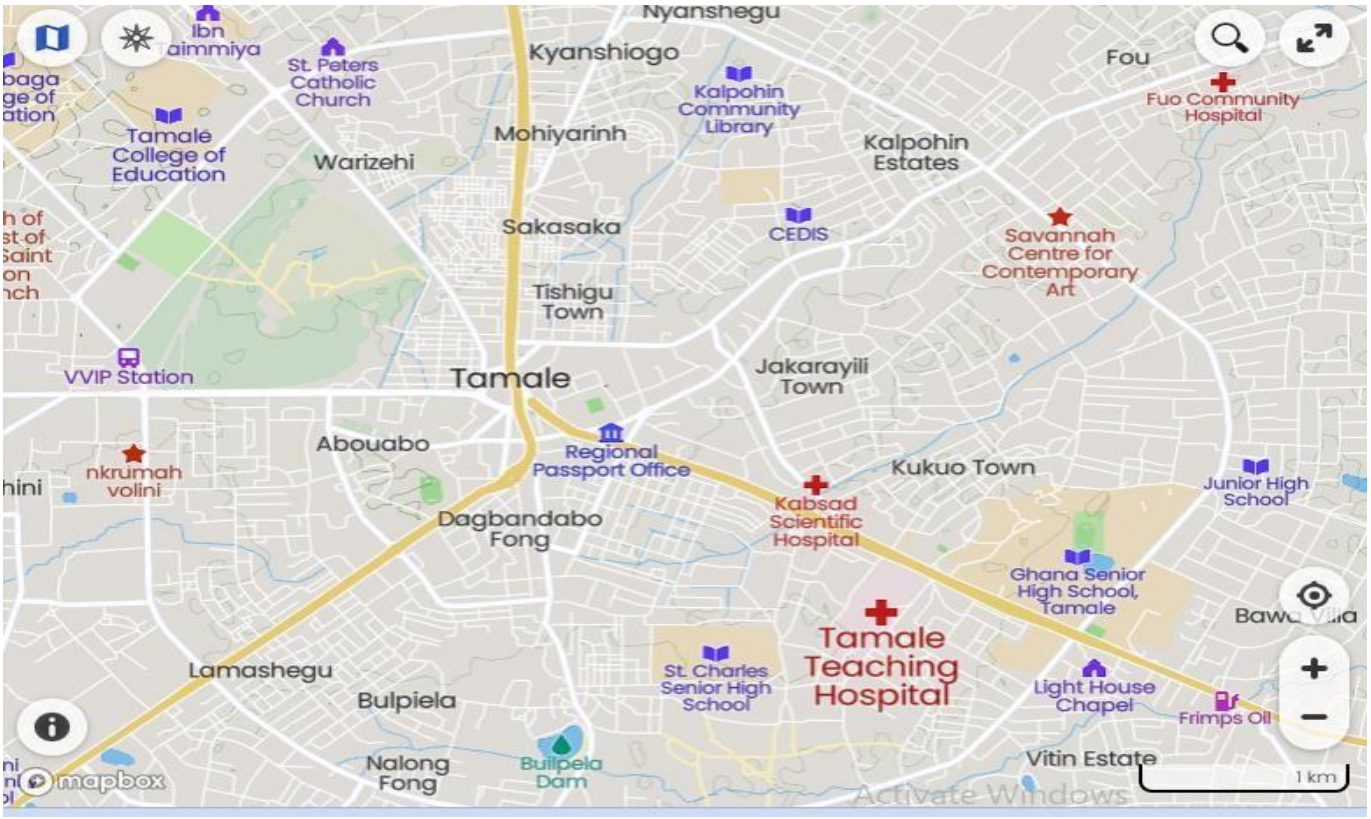


Figure 2: Digital Map of the Study Site indicating the location of TTH

**Research Design**

A research design, according to Creswell (2012), consists of the processes and techniques utilized to perform scientific research. This research study employs a facility-based, analytical cross-sectional study. Prevalence of Postpartum Depression and associated risk factors among postpartum mothers at the Tamale Teaching Hospital of Northern Region were studied using this approach to collect data.

**Study population**

The study population included all postpartum mothers who had been registered to the Postpartum Unit at TTH

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and NICU mothers whose children were being admitted to the Neonatal Intensive Unit at TTH within the period of April and May 2022 were eligible for the study.

**Inclusion Criteria**

Eligible participants included:

1. All women who have delivered and are within the first 6 weeks postpartum and attend the Postpartum clinic at the Tamale Teaching Hospital.

2. Postpartum mothers at the time of questionnaire administration.

3. Postpartum mothers who consent to take part in the study.

**Exclusion Criteria**

All postpartum mothers seriously ill and could not respond to questions during the data collection time will be excluded.

**Sample size and determination**

The sample size for this study was hundred and thirty-five determined by the Cochran (1977) formula. The formula is denoted as follows:

$n = \frac{z^2pq}{\quad}$=z^2pq/d^2

$d^2$

$n = \frac{1.96^2(0.07)(0.93)}{\quad} = 100$

$(0.05)^2$

Allowing for 35% non-response, the sample size was adjusted upwards to:

35___100

$x$ 100 = 35, Therefore 100 + 35 = **135 postpartum mothers.**

Where;

z = standardized z-score for confidence level at 95%.

d = degree of accuracy desired set at 0.05 probability level

p = PPD Prevalence set as 7% according to (Anokye *et al.,* 2018)

q = (1-p) = 0.5,

n = Base sample size required 0.9604.

**Sampling technique**

Postpartum mothers were recruited for the research using a convenience sampling procedure following the conditions of the mothers. The researcher and the research assistants reported to the

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**Data collection technique**

To gather data from chosen postpartum mothers, authorization was gained to access the Neonatal Intensive Care Unit (NICU) records at TTH, and a quantitative survey was done utilizing a structured electronic questionnaire. The data gathering process was overseen by the Principal Investigator and qualified Research Assistants. In April and May 2022, a total of 135 postpartum mothers visiting the prenatal clinic at Tamale Teaching Hospital were conveniently sampled and interviewed.

With the help of two trained research assistants, starting from 9 am in the morning to 1 pm in the afternoon, the sampled postpartum mothers were interviewed using an electronic device – ODK Collect. Interviews were done in both Ghanaian language (Twi) and English depending on the participants preference. Each interview spanned between 20 -25 minus per participants.

In instances where respondents were tired, went through pain or busy, interviews were either stopped and continued after rest or was continued the next or the participants were replaced to avoid any inconveniences and damages.

**Instrument for data collection**

A questionnaire was designed in light of the study objectives. It had four sections, namely section A: socio-demographic of study participants; section B: health systemic factors associated with PPD; section C: risk factors associated with PPD; and section D: The Edinburgh postnatal depression scale for calculating the prevalence of PPD. The questionnaire was converted into an electronic-based survey called ODK Collect for the data collection exercise. The electronic-based questionnaire was protected with a password and only field enumerators had access to ensure data quality. Notepads, in addition to the tablets, were given to enumerators for field record keeping and observations. All this information helped during the data management process before the analysis.

One of the most used tools for detecting postpartum mood and anxiety disorders is the Edinburgh Postnatal Depression Scale (EPDS) (Gibson et al., 2009; Kozinsky et al., 2015). In 1987, British researchers Cox, Holden, and Sagovsky created this self-reporting questionnaire (Cox et al., 1994). It is now widely used in nations with lower/middle incomes that are not Anglophone, in addition to the United Kingdom and other high-income English-speaking and non-English-speaking countries.

The original British validation study (Shrestha et al., 2016) shows that nine out of ten women who were diagnosed by a psychiatrist as being depressed after giving birth were correctly identified in a blinded comparison with scores above a cut-off on the EPDS, which may explain why this brief instrument has become so popular.

It was shown that the EPDS in primary care had a sensitivity of 86%, a specificity of 78%, and a positive predictive value of 73% (i.e., the percentage of respondents who scored positively on the test and had a mental illness identified by clinical interview).

The questionnaire may be given to and completed by postpartum mothers with little effort, and its results can be simply integrated into existing care protocols. It's a 10-item measure used to record signs of depression. Nevertheless, it is used to assess postpartum depressed symptoms rather than diagnose postnatal depression (which can only be done via a psychiatric clinical interview).

Each item is given a score between zero and three on a four- point scale (with zero being the least common and three the most common). A total depression score is calculated by adding the results from all 10 questions. Postpartum depression is considered present when the overall EPDS score is 12, or above, for a woman. The postpartum depression questionnaire has been used before in Ghana (Okronipa *et al.*, 2012) and elsewhere in Africa (Nhiwatiwa *et al.*, 1998).

According to Tavakol and Dennick (2011), validating the reliability of the measuring instrument is one of the basic elements in evaluation. Carmines and Zeller (1979) also commented that reliability deals with the extent to which a measuring instrument will produce the same results on repeated trials.

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Table 3.1 Reliability Statistics for the Edinburgh postnatal depression scale

**Reliability Statistics**

| **Cronbach's Alpha** | **N of Items** |
|---|---|
| **.812** | **10** |

Source: Field survey, (2022)

From table 3.1 the most important thing to look for is the Cronbach's Alpha Coefficient which is 0.812. According to Howland and Wedman (2004) Cronbach's Alpha Coefficient is considered to be reliable if its scale is more than 0.700. From the table 3.1, our coefficient is 0.812, which exceeds 0.700 depicts that our scale is very much reliable. Otherwise, there is the need to consider removing items with low item-total correlations in the column headed Alpha if Item Deleted.

Notwithstanding, it is common to find quite low Cronbach values (e.g., 0.5) for short scales (e.g., scales with fewer than ten items). In such incident, it may be more appropriate to report the mean inter- item correlation for the items. Briggs and Cheek (1986) recommend an optimal range for the interitem correlation of 0.2 to 0.4. However, in this study Table 3.2 shows that the values of the Cronbach's alpha for each component exceeded 0.700 thus confirming the reliability of the measuring instrument- Edinburgh postnatal depression scale.

Table 3.2. Cronbach's Alphas Coefficient Reliability Test

| **Edinburgh postnatal depression scale** | **Cronbach's Alpha if Item Deleted** |
|---|---|
| " In the past week I have been able to laugh and see the funny side of things." | .788 |
| " In the past week I have looked forward with enjoyment to things." | .763 |
| " In the past week I have blamed myself unnecessarily when things went wrong." | .762 |
| " In the past week I have been so unhappy that I have difficulty sleeping." | .889 |
| " In the past week I have felt sad or miserable." | .776 |
| " In the past week I have been anxious or worried for no good reason." | .854 |
| "In the last week I have felt scared or panicky for no very good reason." | .756 |
| "In the past week things have been getting on top of me." | .765 |
| "In the past week I have been so unhappy that I have been crying." | .781 |
| " In the past week the thought of harming myself has occurred to me." | .761 |

Source: Field survey, (2022)

**Pre-test**

Pre-testing of the research instruments (questionnaires) was conducted at the Komfo Anokye Teaching Hospital, which has many of the same features as the Tamale Teaching Hospital. The purpose of this pre-survey was to assess the questions' acceptability, to estimate the time required to perform the research, and to complete the instruments ready for the main research study.

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**Data processing and analysis**

Data collected will be validated, coded, in MS Excel before being transferred to STATA version 16 for final coding and analysis. To characterize significant features of respondents, descriptive statistics will be used. To explore the link between independent factors and the dependent variable, bivariate analyses (binary logistic regression) will be conducted. A multivariable logistic regression model will be fitted using a p-value of 0.05 to estimate the statistical association of the bivariate logistic models. The association's strength will be quantified using odds ratios with 95% confidence intervals.

**Variables**

**Dependent variable**

Symptoms of postpartum depression serve as our dependent measure. The Edinburgh postnatal depression scale was used to determine this. Ten inquiries make up the EPDS. Answers are ranked from 0 to 3 based on whether the symptom is present or not, as well as how severe it is. The final score was calculated by summing the points earned on all 10 questions. Moms having a total EPDS score of 14 or above were diagnosed with postpartum depression, whereas those with a lower total EPDS score were not (0-13 points).

**Independent Variables**

Using the questionnaire, a number of independent variables were established and tested.

These factors are roughly divided into four categories: Socioeconomic variables, sociodemographic factors, maternal and infant-related factors, and clinical considerations.

**Socio-demographic factors:**

maternal age, religion, profession, income, marital status, educational attainment, and place of residence Dunnick

**Maternal and infant-related factors:**

- Antenatal Care Attendance and Frequency of Visits;
- Awareness of Postpartum Depression
- Length of Pregnancy;
- Bed Rest Throughout Pregnancy; And
- Intrapartum or Postpartum Problems.
- Prolonged Hospitalization After Childbirth;
- Previous Miscarriages;
- Infertility Treatment.
- Was the Pregnancy Intended?
- Child's Sex,
- Illness of the Kid
- Incapability of the Infant to Adequately Suckle,

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- Number of Children,
- Temperament of the Infant,
- Difficulties in Feeding the Infant,
- Unique Demands of the Infant

**Socioeconomic Factors**

- cultural traditions and beliefs, such as new moms should not be seen outdoors for a period of time and sitting on hot water after delivery, which may cause the new mother more agony and misery.
- familial Assistance from partners or grandparents in infant care.
- newly divorced,
- modest monthly income,
- low monthly expenditures
- job loss and recent home move

**Clinical variables**

History of psychiatric disease, psychiatric illness in the family, and site of delivery

**Psychological** concerns include intimate relationship abuse, childcare stress, and any kind of family strain.

**Data handling and quality control**

The reliability of the study was ensured by credibility, transferability, dependability and confirmability as suggested by Shenton (2004). Credibility was ensured by adopting well-established research previously used quantitative studies, a pilot study will also be conducted to familiarize the culture of the participants in promoting effective interaction. The study research assistants received a one-day orientation on how to administer the surveys. Daily data collection occurred, and completed questionnaires were cross-examined by the researcher at the end of the day for missing data, completeness, and consistency. Concurrent data input and cleanup were performed in Microsoft Excel.

**Ethical approval**

Before the research could begin, it was necessary to get approval from a number of stakeholders. They comprised hospital administrators and the Ethical Review Committee for the Ghana Health Service. Prior to conducting interviews, participants' consent was obtained. There were no direct dangers involved with this research, except that respondents were urged to refrain from discussing any personal or sensitive information that made them feel uneasy. There were no direct advantages to the study's participants.

However, responders were advised that the information they would offer might help advance general understanding of PPD. Additionally, respondents were told that participation in the research is optional and that they may leave at any moment without incurring any penalties. Participants were advised that there would be no repercussions for withdrawing from the trial, including loss of healthcare or other benefits. The study's data were kept secret and utilized strictly for the study's stated objective. During the data collecting period, privacy was assured by conducting interviews in a separate room dedicated specifically for the project. Data collected with the ODK Collect instrument were protected with a password, and hard copy collected information were securely maintained in locked folders without the identities of research respondents, with access restricted to the researcher and her supervisor.

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# RESULTS

## Socio-Demographic Information of Study Participants

The mean age of respondents was 27.89 ± 5.15 years, with most, 52.59%, who were within the age group 21-30 years, and a majority, 96.3%, of them being married. A higher proportion, 86.67% of the respondents, were Muslims. Only 22.22% had never received formal education, and most, 37.04%, were traders. Also, the mean household size was 9.97 ± 5.86, with most, 40.74%, coming from a house size of more than 10 members, and approximately half, 53.33%, were urban residents. Finally, the average postpartum weeks in days was 12.34 ± 9.43, with the majority, 53.33% of the women, who were in their first to second week postpartum period (Table 4.1).

Table 4. 1: Socio-Demographic Data of Study Respondents at TTH

| **Variable** | **Frequency (n=135)** | **Percent (%)** |
|---|---|---|
| **Age of respondent (years)** | | |
| Mean ± SD | 29.89 ± 6.15 | |
| 18 – 20 | 8 | 6.67 |
| 21-30 | 71 | 52.59 |
| 31-40 | 47 | 34.81 |
| 41-50 | 8 | 5.93 |
| **Marital status** | | |
| Married | 130 | 96.30 |
| Never married | 4 | 2.96 |
| Divorced/separated/Co-habiting | 1 | 0.74 |
| **Religion** | | |
| Christian | 17 | 12.59 |
| Islamic | 117 | 86.67 |
| Others (Traditionalist/Buddhism) | 1 | 0.74 |
| **Level of education** | | |
| JHS/middle school | 30 | 22.22 |
| None | 30 | 22.22 |
| Basic school (Primary & JHS) | 19 | 14.07 |
| SHS/O-level/A-level | 26 | 19.26 |
| Tertiary | 30 | 22.22 |

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| | | |
|---|---|---|
| **Occupation** | | |
| Unemployed | 33 | 24.44 |
| Professional | 20 | 14.82 |
| Business/traders | 49 | 37.04 |
| Manual labourers | 33 | 23.70 |
| **Household Size** | | |
| Mean ± SD | 9.97 ± 5.86 | |
| 1 – 5 | 43 | 31.85 |
| 6-10 | 37 | 27.41 |
| > 10 | 55 | 40.74 |
| **Place of Residence** | | |
| Rural | 63 | 46.67 |
| Urban | 72 | 53.33 |
| **Postpartum weeks** | | |
| Mean ± SD *(in days)* | 12.34 ± 9.43 | |
| < 1 week | 28 | 20.74 |
| 1 – 2 weeks | 72 | 53.33 |
| > 2 weeks | 35 | 25.93 |

Source: Field Survey, 2022

**Maternal and infant related characteristics of respondents**

Study respondents' maternal and infant-related variables were also investigated. Tables 4.2, 4.3, and located at the appendix section show the findings. During pregnancy, 99.26% of the 135 postpartum mothers visited an antenatal clinic, especially between 3-6 months of pregnancy (61.48%). The average ANC visit among those who attended ANC was 7.03 ± 1.86, with the majority (68.15%) of postpartum women attending antenatal clinic at least 7 times. However, just 12.59 % had received postpartum depression counseling from a health provider at an ANC visit. Furthermore, majority, 90.37% reported to have planned their pregnancy, however, 21.48% of the mothers revealed that their pregnancy was not wanted with majority, 68.15% who refused this question. (See table 4.2 in the appendix).

Table 4.3 (see appendix) also indicates that the percentage of respondents (85.19%) had their desired baby, with the majority of deliveries (60.0%) being vaginal deliveries and the remainder being caesarian section (40.0%). After giving birth, the majority of respondents (85.19%) stayed at the TTH labor ward for less than a week before being discharged, with only 2.96 percent still not discharged at the time of data collection. Again, a small number of respondents, 23.7 percent, had previously suffered a miscarriage, with all of them having given birth to a single child. Finally, the average number of children was 2.53 ± 1.50, with 44.44 percent having at least three.

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The findings (see tables 4.4 in the appendix) also demonstrated that the majority of postpartum women (86.67%) were able to adequately breastfeed their infants, and just a handful of the babies (13.33%) were admitted to the NICU following delivery (14.81%). Further analysis found that 18.52 percent of mothers had issues following delivery, while 8.15 percent of the participants experienced complications together with their babied. Major complications reported were baby breathing difficulty (3.7%), high blood pressure (5.19%), vaginal/cervical cut (2.22%), blood shortage (2.96%), and others (fibroids, jaundice, anemia, bleeding, premature delivery, cervix dilatation, postpartum hemorrhage) (11.85%).

**Clinical, Lifestyle and Psychological Features of Study Participants**

Table 4.5 depicts the clinical, lifestyle and psychological information about the participants. A history of depression was indicated by 14.07% of the 135 respondents. When asked whether they stay away from health care facilities, the majority (71.85 percent) said yes. Nevertheless, almost all of them (97.78%) were pleased with the attitude of health staff. Few, 5.93% of the respondents reported recent maltreatment by their husbands/partners, while a small proportion (7.41%) had previously experienced some kind of pressure. Finally, a closer look at the participants' lifestyle reveals that the vast majority, 42.22 percent refuse to exercise regularly. The average daily hours of sleep recorded by respondents were 5.28 ± 1.33, with the majority, 56.3%, sleeping fewer than 6 hours. Finally, with regards to the pattern of food intake after birth majority, 55.56%, had one meal per day.

Table 4. 2: Clinical, Lifestyle, and Psychological Features of Study Participants

| **Variable** | **Frequency (n=135)** | **Percent (%)** |
|---|---|---|
| **Previous history of depression** | | |
| No | 114 | 84.44 |
| Refused | 2 | 1.48 |
| Yes | 19 | 14.07 |
| **Distance from health facility.** | | |
| No | 38 | 28.15 |
| Yes | 97 | 71.85 |
| **Satisfied with the attitude of health workers** | | |
| No | 3 | 2.22 |
| Yes | 132 | 97.78 |
| **Recent abuse from partner** | | |
| No | 122 | 90.37 |
| Refused | 5 | 3.70 |
| Yes | 8 | 5.93 |
| **Experienced any sort of pressure** | | |
| No | 123 | 91.11 |
| Refused | 2 | 1.48 |

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| | | |
|---|---|---|
| Yes | 10 | 7.41 |
| **Daily hours of sleep during postpartum period** | | |
| Mean ± SD | 5.28 ± 1.33 | |
| < 6 hours | 76 | 56.30 |
| 6 hours | 39 | 28.89 |
| > 6 hours | 20 | 14.81 |
| **How often do you exercise after giving birth** | | |
| Not at all | 57 | 42.22 |
| Regular | 39 | 28.89 |
| Sometimes | 39 | 28.89 |
| **Number of meals per day after birth** | | |
| One meal | 75 | 55.56 |
| Two meals | 47 | 34.81 |
| Three meals | 12 | 8.89 |
| Refused | 1 | 0.74 |

Source: Field Survey, 2022

**Prevalence of Postpartum Depression among Study Participant**

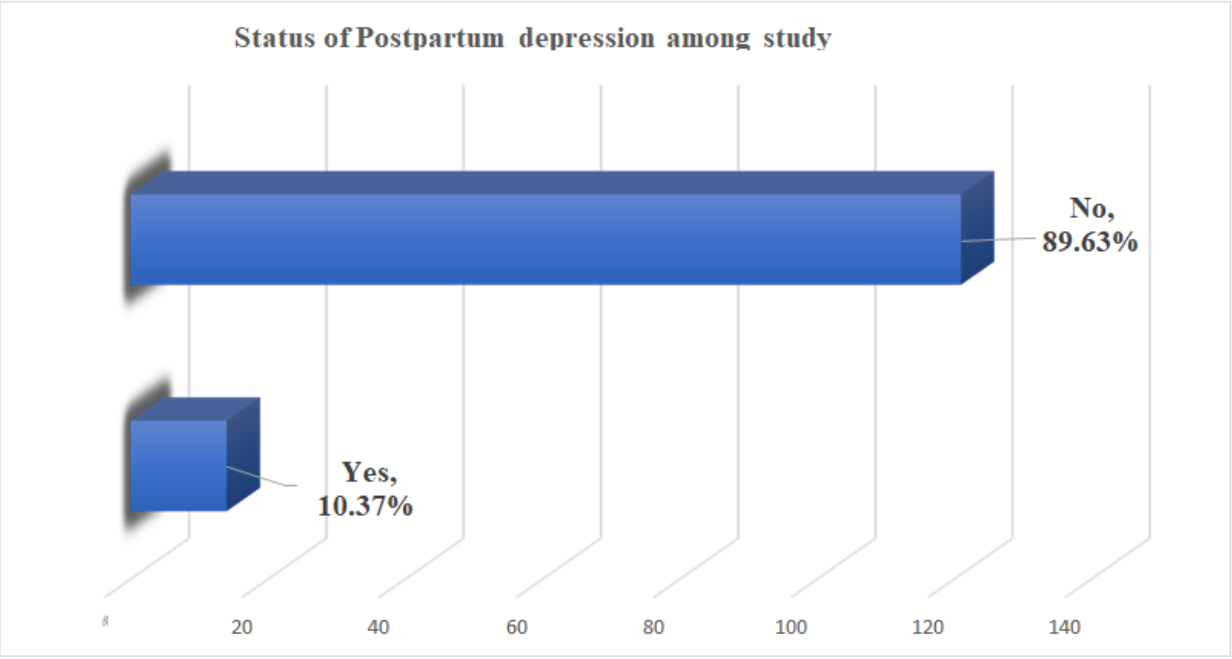


Figure 3 illustrates that 10.37 percent (14/135) of postpartum mothers questioned at Tamale Teaching Hospital had postpartum depressive symptoms according to the Edinburgh Postnatal Depression Scale (EPDS).

Figure 3: Status of postpartum depression among study participants.

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**Factors associated with postpartum depressive symptoms**

**Socio-demographic factors associated with postpartum depression among postpartum mothers**

This research investigates the variables related with postpartum depression incidence in postpartum women in order to achieve all of the study objectives. Firstly, bivariate investigations were performed initially to see if there were any links among socio-demographic characteristics and the presence of postpartum depression between study participants. The findings (see table 4.6) revealed that none of the socio-demographic characteristics investigated were substantially linked with postpartum depressed mood.

Table 4. 3: Association among socio-demographic information and PPD (Bivariate Analysis)

| **Characteristic** | **Postpartum Depression** | | **p-value[2]** |
|---|---|---|---|
| | **NO, N = 121[1]** | **YES, N = 14[1]** | |
| **Age** | | | 0.4 |
| *18 - 20* | 7 (5.8%) | 2 (14%) | |
| *21-30* | 65 (54%) | 6 (43%) | |
| *31-40* | 42 (35%) | 5 (36%) | |
| *41-50* | 7 (5.8%) | 1 (7.1%) | |
| **Marital status** | | | 0.084 |
| *Married* | 118 (98%) | 12 (86%) | |
| *Never Married* | 2 (1.7%) | 2 (14%) | |
| *Refused* | 1 (0.8%) | 0 (0%) | |
| **Level of education** | | | 0.5 |
| *JHS/middle sch.* | 25 (21%) | 5 (36%) | |
| *None* | 27 (22%) | 3 (21%) | |
| *Primary* | 17 (14%) | 2 (14%) | |
| *SHS/O-level/A-level.* | 22 (18%) | 3 (21%) | |
| *Tertiary* | 29 (24%) | 1 (7.1%) | |
| **Religious Affiliation** | | | 0.095 |
| *Christian* | 14 (12%) | 3 (21%) | |
| *Muslim* | 106 (88%) | 10 (79%) | |
| *Traditionalist* | 1 (0.8%) | 0 (0%) | |
| **Occupation** | | | 0.2 |
| *Unemployed* | 28 (23%) | 5 (36%) | |
| *Professional* | 20 (17%) | 0 (0%) | |

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| | | | |
|---|---|---|---|
| *Business/traders* | 42 (35%) | 7 (50%) | |
| *Manual labourers* | 31 (25%) | 2 (14%) | |
| **Household Size** | | | 0.457 |
| *1 - 5* | 40 (33%) | 3 (21%) | |
| *6-10* | 34 (28%) | 3 (21%) | |
| *> 10* | 47 (39%) | 8 (58%) | |
| **Place of Residence** | | | 0.257 |
| *Rural* | 54 (45%) | 9 (64%) | |
| *Urban* | 67 (55%) | 5 (36%) | |
| **Weeks of postpartum** | | | 0.062 |
| *< 1 week* | 28 (23%) | 0 (0%) | |
| *1 – 2 weeks* | 61 (50%) | 11 (79%) | |
| *> 2 weeks* | 32 (27%) | 3 (21%) | |
| [1]n (%); Median (IQR), * statistically significant at 0.05 and ** statistically significant at 0.01 | | | |
| [2]Fisher's exact test; Pearson's Chi-squared test; Wilcoxon rank sum test | | | |

**Maternal and Infant factors associated with potential postpartum depression**

The research also looked at the relationship between a variety of mother and newborn factors and postpartum depressed disorders. The findings are presented in the tables 4.7, 4.8, and 4.9. The bivariate analysis in table 4.7 shows that none of the prenatal and pregnancy-related variables were substantially linked with PPD.

Table 4. 4: Antenatal and Pregnancy-related factors associated with Postpartum depressive symptoms (Bivariate Analysis)

| **Characteristic** | **Postpartum Depression** | | **p-value[2]** |
|---|---|---|---|
| | **NO, N = 121[1]** | **YES, N = 14[1]** | |
| **Pregnancy planned** | | | 0.654 |
| *No* | 10 (8.3%) | 2 (14%) | |
| *Refused* | 1 (0.8%) | 0 (0%) | |
| *Yes* | 110 (92%) | 12 (86%) | |
| **Antenatal clinic** | | | 0.10 |
| *No* | 0 (0%) | 1 (7%) | |
| *Yes* | 121 (100%) | 13 (93%) | |
| **Pregnancy wanted** | | | 0.7 |

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| | | | |
|---|---|---|---|
| *No* | 12 (10%) | 2 (14%) | |
| *Refused* | 82 (68%) | 10 (71%) | |
| *Yes* | 27 (22%) | 2 (14%) | |
| **Age of pregnancy when ANC started** | | | 1.0 |
| <3 months | 46 (38%) | 5 (36%) | |
| 3-6 months | 74 (61%) | 9 (64%) | |
| >6 months | 1 (0.8%) | 0 (0%) | |
| **Number of ANC visits** | | | 0.5 |
| < 4 times | 5 (4%) | 1 (7%) | |
| 4-6 times | 32 (27%) | 5 (36%) | |
| > 6 times | 84 (69%) | 8 (57%) | |
| **Professional counsel on PPD during ANC** | | | 0.7 |
| *No* | 105 (88%) | 12 (86%) | |
| *Yes* | 15 (12%) | 2 (14%) | |
| [1]n (%); Median (IQR), * statistically significant at 0.05 and ** statistically significant at 0.01 | | | |
| [2]Fisher's exact test; Pearson's Chi-squared test; Wilcoxon rank sum test | | | |

From table 4.8, the analysis shows that there is no significant association between delivery history related factors and postpartum depression among study respondents.

Table 4. 5: Delivery history -related factors associated with Postpartum Depressive symptoms (Bivariate Analysis)

| | **Postpartum Depression** | | **p- value[2]** |
|---|---|---|---|
| **Characteristic** | **NO, N = 121[1]** | **YES, N = 14[1]** | |
| **Baby is the gender/sex you wanted** | | | 0.4 |
| *No* | 11 (9%) | 2 (14%) | |
| *Refused* | 6 (5%) | 1 (7%) | |
| *Yes* | 104 (86%) | 11 (79%) | |
| **Type of delivery** | | | 0.8 |
| *Caesarean section* | 48 (39%) | 6 (43%) | |
| *Vaginal delivery* | 73 (61%) | 8 (57%) | |
| **Time spent before discharged** | | | |
| *Not yet discharged* | 4 (3%) | 0 (0%) | |

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| | | | |
|---|---|---|---|
| *Less than a week* | 101 (84%) | 14 (100%) | |
| *A week or more* | 16 (13%) | 0 (0%) | |
| **Had previous miscarriages** | | | 0.3 |
| *No* | 88 (72%) | 13 (93%) | |
| *Refused* | 2 (2%) | 0 (0%) | |
| *Yes* | 31 (26%) | 1 (7%) | |
| **Respondent's Number of Children** | | | 0.1 |
| *None* | 0 (0%) | 1 (7%) | |
| *1* | 35 (29%) | 4 (29%) | |
| *2* | 33 (27%) | 2 (14%) | |
| *>= 3* | 53 (44%) | 7 (50%) | |
| [1]n (%); Median (IQR), * statistically significant at 0.05 and ** statistically significant at 0.01 | | | |
| [2]Fisher's exact test; Pearson's Chi-squared test; Wilcoxon rank sum test | | | |

Further analysis, as shown in table 4.9, shows that, with the exception of complications identified (p=0.049), none of the infant-related variables after delivery were substantially linked with postpartum depression among survey respondents.

Table 4. 6: Infant related Characteristics after birth associated with PPD (Bivariate Analysis)

| **Characteristic** | **Postpartum Depression** | | **p-value[2]** |
|---|---|---|---|
| | **NO, N = 121[1]** | **YES, N = 14[1]** | |
| **Baby born with congenital diseases/malformations** | | | 0.7 |
| *No* | 103 (85%) | 13 (93%) | |
| *Refused* | 1 (1%) | 0 (0%) | |
| *Yes* | 17 (14%) | 1 (7%) | |
| **Baby admitted at NICU after delivery** | | | 0.7 |
| *No* | 101 (83%) | 13 (93%) | |
| *Refused* | 1 (1%) | 0 (0%) | |
| *Yes* | 19 (16%) | 1 (7.1%) | |
| **Complications during the delivery** | | | 0.255 |
| *No, nothing with either of us* | 88 (73%) | 8 (57%) | |
| *Refused* | 2 (2%) | 1 (7%) | |
| *Yes, complication with me* | 21 (17%) | 4 (29%) | |

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| | | | |
|---|---|---|---|
| *Yes, complication with the baby* | 10 (8%) | 1 (7%) | |
| **State complication if any** | | | **0.049*** |
| *Baby difficulty in breathing* | 4 (3%) | 1 (7.1%) | |
| *High blood pressure* | 5 (4%) | 2 (14%) | |
| *Shortage of blood* | 4 (3%) | 2 (14%) | |
| *Vaginal/Cervical cut* | 3 (3%) | 0 (0%) | |
| *None* | 91 (75%) | 9 (64%) | |
| *OTHERS (Fibroids, Anaemia, Bleeding, Cervix dilation, Postpartum haemorrhage, Premature birth, Jaundice)* | 14 (12%) | 0 (0%) | |
| **Difficulty feeding your baby** | | | 0.5 |
| *No* | 106 (87%) | 11 (79%) | |
| *Refused* | 2 (2%) | 0 (0%) | |
| *Yes* | 13 (11%) | 3 (21%) | |
| [1]n (%); Median (IQR), * statistically significant at 0.05 and ** statistically significant at 0.01 | | | |
| [2]Fisher's exact test; Pearson's Chi-squared test; Wilcoxon rank sum test | | | |

**Clinical, Lifestyle and psychological features associated with PPD (Bivariate Analysis)**

The study went on to look at the relationship between a variety of clinical, lifestyle, and psychological factors and postpartum depressed mood. Table 4.10 summarizes the findings. According to the table, bivariate analysis revealed a link between the following factors with PPD: pressure from family members/friends (p0.001), daily hours of sleep during the postpartum period (p=0.01), and exercise after giving birth (p=0.046).

Table 4. 7: Clinical, Lifestyle and psychological features associated with Postpartum Depressive symptoms (Bivariate Analysis)

| **Characteristic** | **Postpartum Depression** | | **p- value[2]** |
|---|---|---|---|
| | **NO, N = 121[1]** | **YES, N = 14[1]** | |
| **Previous history of depression** | | 0.3 | |
| *No* | 104 (86%) | 10 (71%) | |
| *Refused* | 2 (2%) | 0 (0%) | |
| *Yes* | 15 (12%) | 4 (29%) | |
| **Health facility is far** | | 0.8 | |
| *No* | 35 (29%) | 3 (21%) | |
| *Yes* | 86 (71%) | 11 (79%) | |
| **Satisfaction with health workers attitude** | | >0.9 | |

| | | |
|---|---|---|
| *No* | 3 (2%) | 0 (0%) |
| *Yes* | 118 (98%) | 14 (100%) |
| **Recently abuse from husband** | | 0.12 |
| *No* | 110 (91%) | 12 (86%) |
| *Refused* | 3 (2.5%) | 2 (14%) |
| *Yes* | 8 (6.7%) | 0 (0%) |
| **Pressure from family members/friends** | | **<0.001**** |
| *No* | 115 (95%) | 8 (57%) |
| *Refused* | 2 (2%) | 0 (0%) |
| *Yes* | 4 (3%) | 6 (43%) |
| **Daily hours of sleep during postpartum period** | | **0.01*** |
| < 6 hours | 66 (55%) | 10 (71%) |
| 6 hours | 39 (32%) | 0 (0%) |
| > 6 hours | 16 (13%) | 4 (29%) |
| **Exercise after giving birth** | | **0.046*** |
| *Not at all* | 51 (42%) | 6 (43%) |
| *Regular* | 38 (32%) | 1 (7.1%) |
| *Sometimes* | 32 (26%) | 7 (50%) |
| **Number of meals per day after birth** | | 0.352 |
| One meal | 64 (53%) | 11 (79%) |
| Two meals | 44 (36%) | 3 (21%) |
| Three meals | 12 (10%) | 0 (0%) |
| Refused | 1 (1%) | 0 (0%) |

[1]n (%); Median (IQR), * statistically significant at 0.05 and ** statistically significant at 0.01

[2]Fisher's exact test; Pearson's Chi-squared test; Wilcoxon rank sum test

**Determinants of postpartum depression among postpartum mothers at TTH**

All covariates considered as significant following the bivariate analyses were subjected to multiple logistic regression. These characteristics included reported postpartum complications, pressure from family/partner/friends, daily hours of sleep during the postpartum period, and how often you exercise after giving baby. At the multivariate logistic regression analysis level (P≤0.05), only two of these characteristics were significantly linked with experiencing PPD (see table 4.11). These include family/partner/friend pressure and daily hours of sleep during the postpartum period. Women who received pressure from close family or friends had 13.8 times the chances of experiencing postpartum depression symptoms compared to those who did not experience pressure from immediate family or friends (AOR=13.18; CI=2.069-84.009). Women who slept more

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than 6 hours per day had a 25% lower risk of developing symptoms of depression than those who slept six (6) or fewer hours per day (AOR=0.745; CI=0.020-6.615). In the multivariate logistic model, recognized complications after delivery and exercising after giving birth were not significant.

Table 4. 8: Factors associated with postpartum Depression among Study Participants at TTH (Multivariate Analysis)

| **Characteristic** | **Postpartum Depression** | | **Unadjusted** | **p-value 2** | **Adjusted** | **p-value[2]** |
|---|---|---|---|---|---|---|
| | **NO, N = 121[1]** | **YES, N = 14[1]** | **OR (95% CI)** | | **OR (95% CI)** | |
| **Pressure from family members/friends** | | | | | | 0.084 |
| *No* | 115 (95%) | 8 (57%) | Reference | | Reference | |
| *Refused* | 2 (2%) | 0 (0%) | 1 | | 1 | |
| *Yes* | 4 (3%) | 6 (43%) | 13.80 (2.287-83.316) | **0.004** | 13.18 (2.069-84.009) | **0.006** |
| **State complication if any** | | | | | | |
| *Baby difficulty in breathing* | 4 (3%) | 1 (7.1%) | Reference | | Reference | |
| *High blood pressure* | 5 (4%) | 2 (14%) | 0.219 (0.007-6.513) | 0.380 | 0.240 (0.005-12.083) | 0.476 |
| *Shortage of blood* | 4 (3%) | 2 (14%) | 1 | | 1 | |
| *Vaginal/Cervical cut* | 3 (3%) | 0 (0%) | 1 | | 1 | |
| *None* | 91 (75%) | 9 (64%) | 0.183 (0.012-2.613) | 0.210 | 0.207 (0.011-4.039) | 0.293 |
| *OTHERS (Fibroids, Anaemia, Bleeding, etc.)* | 14 (12%) | 0 (0%) | 0.187 (0.007-4.823) | 0.312 | 0.200 (0.006-6.260) | 0.36 |
| **Daily hours of sleep during postpartum period** | | | | | | |
| < 6 hours | 66 (55%) | 10 (71%) | Reference | | Reference | |
| 6 hours | 39 (32%) | 0 (0%) | 1 | | 1 | |
| > 6 hours | 16 (13%) | 4 (29%) | 0.802 (0.137-5.677) | **0.048** | 0.745 (0.020-6.615) | **0.049** |
| **Exercise after giving birth** | | | | | | |
| *Not at all* | 51 (42%) | 6 (43%) | Reference | | Reference | |

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| | | | | | | |
|---|---|---|---|---|---|---|
| *Regular* | 38 (32%) | 1 (7.1%) | 0.531 (0.049-5.667) | 0.6 | 0.532 (0.05-5.696) | 0.6 |
| *Sometimes* | 32 (26%) | 7 (50%) | 2.191 (0.529-9.074) | 0.279 | 2.213 (0.529-9.255) | 0.277 |

***p<0.05; OR= odds ratio; CI=confidence interval**

# DISCUSSION

## Characteristics of study Participants

The study found the mean age of respondents to be 29.89 ± 6.15 years, and 71 respondents represented 52.59 % were in the age bracket 21-30. Out of the 135 respondents, 130 (96.30%) were married, and 117 (86.67%) were affiliated to Islamic religion. Apart from 30 (22.22%) respondents, all respondents had attained a certain level of formal education. Traders formed the majority (37.04%) of the respondents, and 40.74% were members of household size greater than 10. This result is consistent with the socio-demographic results of a study by Anokye et al. (2018), who found the average age of respondents to be 27 years, and more than half of the respondents were married. Also, in their study, more than half of the respondents had attained a certain level of formal education, and the majority were not employed in the formal sector. Likewise, in a study by Sefogah et al. (2020), they found that most new mothers aged 20-34 years old, the majority of respondents were married, and a few had no formal education. These preliminary investigations are necessary since some socio-demographic features of women influence their level of postpartum depression, as revealed by Weobong et al. (2015).

Respondents' maternal and infant-related variables investigated showed that 134 (99.26%) of pregnant women attended ANC, and 83 (61.48 %) initiated ANC visits at the beginning to the end of the second trimester. Studies have shown that women with ANC covered by health insurance are likely to attend ANC (Wang et al., 2017; Yaya et al., 2019), and this agrees with the results of this study. This might have attributed to the mass patronage of ANC by almost all respondents since ANC is covered by health insurance. It further suggests that most financial barriers to the access of maternal health care have been removed, granting women irrespective of the social class to access ANC (Novignon et al., 2019). In line with the recommendation of WHO as revealed by Gebremeskel et al. (2015), ANC visits should be initiated in the trimester one of pregnancy. Unfortunately, the results of this study showed that most women do not adhere to the recommendation of the World Health Organization. Out of the 135 respondents, only 37.78% reported of initiating ANC visits in the first trimester, with the majority (61.48%) starting ANC visits in the second trimester. Similar to the results of Kotoh and Boah (2019), they found out that majority (57.1%) of women in Builsa South District of the Upper East Region of Ghana initiated ANC visits in the second trimester. Conversely, Manyeh et al. (2020) found that majority of women in Dodowa and its surroundings initiate ANC visits in the first trimester, and this contravention to this study's results could be attributed to study location, the year of study, and the sample size of respondents.

The majority (68.15%) of postpartum women attended antenatal clinic at least 7 times prior to delivery, as also reported by Afaya et al. (2018). This is below WHO recommendation, and the forfeiture of ANC or incomplete visits deprive women of the benefits the program is meant to unleash. Unfortunately, it seems the ANC program does not have interesting packages such as management of maternal depression, and this is evident by the low figure (12.59%) of respondents who had some form of postpartum depression counseling from a health provider at an ANC visit. The results on postpartum depression counseling corroborate the assertion of Pobee et al. (2022) who posited that Ghana, and many developing parts of the world, do not pay attention to depressive symptoms amongst pregnant women due to low priority of mental health, lack of mental health facilities, amongst others. Adams and Sladek (2022) have also found that most midwives do not have adequate knowledge and skills in managing postpartum depression through counselling.

85.19% had their desired baby, with the majority of deliveries (60.0%) being vaginal deliveries and the remainder being caesarian section (40.0%), and this according to Afaya et al. (2018) is influenced by women's knowledge of the indications for CS and the perceived consequences of the mode of delivery. Danso *et al*. (2009) found that most women in Ghana prefer to have vaginal delivery compared to CS, and the reasons for women's choice

include less pain, the frightening nature of CS, shorter stay in the hospital, amongst others. In a study by Darteh (2020), he found that women aged 30 years and above are likely to deliver by CS, suggesting that 47 (34.81%) of respondents aged 31 and above might be part of the 40% who had delivered by CS.

After giving birth, the majority of respondents (85.19%) stayed at the TTH labor ward for less than a week before being discharged, and this is because most respondents did not experience postpartum complications; babies had not developed malformations, babies were not admitted at NICU, and mothers did not experience difficulty in feeding their babies.

**Clinical, Lifestyle and Psychological Features of Study Participants**

Approximately 14 percent of the 135 people who responded stated that they had a previous history of depression. The results of this collaborative effort between O'Hara and Swain's (1996). A minor number of the respondents (7.41%) had previously suffered some kind of pressure, and the results of this survey demonstrate that 5.93% of the respondents reported recent instances of mistreatment at the hands of their spouses or partners. Similarly, Johnstone et al. (2001) found that women who have had postpartum depression in the past are more likely to have it again than women who have not had postpartum depression in the past. This is in contrast to women who have not had postpartum depression in the past. Another finding that emerges from taking a more in-depth look at the lifestyle choices made by the participants is that 42.22 percent of them do not engage in regular physical activity. According to Nordhagen and Sundgot-(2002) Borgen's research, women who exercised moderately throughout their third trimester of pregnancy had a lower score on the postpartum depression scale six weeks after giving birth. In conclusion, respondents reported a daily average of 5.28 hours of sleep, with a standard deviation of 1.33 hours. The majority of respondents, 56.3%, slept for less than 6 hours. In light of this pessimistic outlook, Dinas, Koutedakis, and Flouris (2011) found in their research that engaging in regular physical exercise and eating a healthy diet are both associated with improved psychological health.

**Prevalence of Postpartum Depression among Study Participant**

From the study, 14 (10.37%) of respondents showed symptoms of postpartum depression which is lower than previous study results. In Sefogah *et al*. (2020)'s study, 27.5% had symptoms of PPD. The findings of Cadri et al. (2020) indicated 32.6% prevalence of postpartum depression in their study. Buabeng (2015) estimated an approximately 22% of maternal depression in Ghana. In comparison, Wemakor and Iddrisu's (2018) research in the northern region of Ghana reported a higher prevalence of postpartum depression (33.5%), which was previously observed for a subpopulation in Ghana (3.8– 27.8%). Nonetheless, Anokye et al. (2018) discovered that the symptoms of PPD were present in 7% of 257 women, which is a lower proportion than the one that was observed in this research. The differences might be attributable to the data instrument that was used, the location of the research, and even, to a certain degree, the number of respondents that participated in the study.

**Factors associated with postpartum depression**

The socio-demographic factors investigated to ascertain the association with PPD were age, marital status, level of education, religious affiliation, occupation, household size, place of residence, weeks of postpartum. The findings showed that none of the listed factors were significantly associated with PPD amongst women in the study area. This is similar to the results of Chinawa et al. (2016) who found no association between age, educational level, occupation, parity, and mode of delivery. This is contrary to most studies on the prevalence of PPD amongst women in Ghana. For instance, Anokye *et al*. (2018) found a significant association between ethnicity and PPD, and occupation and PPD. Also, Abdulai (2019) found a significant association between employment and depression status. In a study by Cadri *et al*. (2020), adjustment of odds ratio yielded an association between social health issues and PPD. However, the results of this study agree with part of Sefogah *et al*. (2020) study, who found no association between sociodemographic factors and PPD for respondents in LEKMA in Accra. However, for participants from Ridge hospital, an association was found between marital status and PPD. In essence, the study locations have played major roles in the variations in study results.

There was no significant association between mode of delivery and PPD, and this finding was contrary to the study of Sefogah *et al*. (2020) who found that women who had spontaneous vaginal delivery also had increased odds

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of depression compared to those who delivered by cesarean section. However, pressure from family and friends, and daily hours of sleep during postpartum period were found in this study to be positively associated with PPD. This implies that there has been a significant improvement in the interventional projects to reduce factors that leads to postpartum depressive symptoms however there is still a need for counseling and psychological assistance for new and young mothers as well as their immediate family.

### Explanation of findings and implications

There was no link found between the number of prenatal visits made during pregnancy and postpartum depression. Pregnant women who visited a prenatal clinic did so more than four times over the final nine months of their pregnancies, according to the statistics. It is probable that this finding is due to the fact that women who use ANC the most have the opportunity to get counseling from health experts that enhances their knowledge of the effects of postpartum depression and how to guide themselves against it. As a result, health practitioners and other members of civic society should make every effort to encourage mothers to attend ANC as often as possible. Women who were exposed to pressure from loved ones were 13.80 times more likely to suffer postpartum depression than those who were not (AOR=13.18; CI=2.069-84.009). Women who slept for seven (7) hours or more per day had a 25% lower risk of developing depressive symptoms than women who slept for six (6) hours or less per day (AOR=0.745; CI=0.020-6.615). This research suggests that mothers did not obtain enough rest after giving birth, which may have led to the development of postpartum depression. Moreover, parents who faced pressure from close relatives or friends as a predictor demonstrate that there is still a form of cultural practice, attitude, and abuse that breaches mothers' rights, which must be addressed. As a result, it is critical to educate primary caregivers of mothers, particularly partners and siblings, throughout the study region's different civilizations on the need of showering mothers with love and support.

### Strengths and Limitations of study

The findings of this study have important implications for maternal and child health policy interventions and strategies because they shed light on previously unknown information about postpartum depressive symptoms and their associated factors among postpartum women attending clinic at Tamale Teaching Hospital. Nevertheless, there are significant drawbacks to the conclusions of this research. As a cross-sectional investigation, the first thing to notice is that no causation relationship was established between the numerous components that were evaluated. Second, since the information supplied could not be verified by a clinical psychologist, respondents' prejudice, especially recall bias, may have limited the study's results. According to the findings of this questionnaire-based quantitative study, clinical psychologists should contact the women who reported symptoms of postpartum depression. Moreover, the findings are hampered by the adoption of a convenient sampling approach, since only individuals who utilized the facility during the data collection period were invited to participate in the study.

## CONCLUSION AND RECOMMENDATIONS

### Conclusion

In this research, postpartum women who delivered at the Tamale Teaching Hospital were evaluated for the prevalence and predictors of postpartum depression symptoms. According to the Edinburgh Postnatal Depression Scale, approximately 10% of the women suffered severe depressive symptoms (EPDS). After controlling for any confounding variables, pressure from close family and friends, and the hours of sleep postpartum mothers get each day after childbirth were revealed to be significant predictors of postpartum depression symptoms. Out of the 135 postpartum women surveyed, and the majority of them were married, with a household size of at least 10 and literacy levels of at least 78%, according to the study. They were also mostly Muslim (87%) and urban inhabitants (53%). Participants in the research had EPDS depression symptoms scores classified as high but only two associated risk factors were identified by the study; experienced pressure from immediate family/close friends (AOR=13.18; CI=2.069-84.009; p=004) and daily hours of sleep during the postpartum period (AOR=0.745; CI=0.020-6.615; p=0.048), statistically significant in predicting postpartum depression symptoms among the socio-demographic, maternal, Clinical, Lifestyle, and psychological factors studied. Postpartum depression symptoms in postpartum mothers should be addressed urgently with the aid of

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counseling and psychological support both in health facilities and at their various homes according to these findings.

**Recommendation**

The following public health, clinical, and future research proposed suggestions are given in light of the evidence provided in the last two chapters.

**Clinical Interventions**

Intensive counselling on having enough sleep after giving birth as well as the need to avoid pressure of any should be encouraged during ANC. Also, to diagnose and treat PPD early, the Ministry of Health should explore incorporating mental health screening into normal MCH treatment. This screening may also be extended to the prenatal period so that at-risk women can be identified early and preventative steps taken.

**Public Health**

Nurses and midwives at the Tamale Teaching Hospital's prenatal section can help pregnant women learn about depression symptoms and what to do about them. Counseling and psychological assistance for new and young mothers, whether at home or in a facility, should be promoted as part of this public health initiative to help combat postpartum depression symptoms.

**Future Research**

Tamale Teaching Hospital management and other researchers should examine health personnel awareness of postnatal depression.

Also, the high prevalence of postpartum depression in our sample necessitates qualitative research on the psychosocial problems encountered by postpartum women in Tamale in order to establish psychosocial programs that minimize the incidence of PPD among new mothers.

To conclude, future research with greater sample sizes should also study the relationship among prenatal care and postpartum depression.

**Dedication**

This study is dedicated to the only wise God for His unchanging love. Also, thank you to my wonderful mother, Madam Diana Asabea, and my dearest friend and research assistant, Mr. Emmanuel Keku, for their unwavering support that has contributed to my academic achievement today.

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# APENDICES

Appendix 1- results from table 4.2, 4.3, 4.4 and 4.5 Table 4. 9: Antenatal and Pregnancy-related of Study Participants

| Variable | Frequency (n=135) | Percent (%) |
|---|---|---|
| **Was pregnancy planned** | | |
| No | 12 | 8.89 |
| Refused | 1 | 0.74 |
| Yes | 122 | 90.37 |
| **Attend ANC during pregnancy** | | |
| No | 1 | 0.74 |
| Yes | 134 | 99.26 |
| **Was the pregnancy wanted** | | |
| No | 14 | 10.37 |
| Refused | 92 | 68.15 |
| Yes | 29 | 21.48 |
| **Age of pregnancy when ANC started** | | |
| <3 months | 51 | 37.78 |
| 3-6 months | 83 | 61.48 |
| >6 months | 1 | 0.74 |
| **Number of ANC visits** | | |
| Mean ± SD | 7.03 ± 1.86 | |
| < 4 times | 6 | 4.44 |
| 4-6 times | 37 | 27.41 |
| > 6 times | 92 | 68.15 |
| **Professional counsel on PPD during ANC** | | |
| No | 118 | 87.41 |
| Yes | 17 | 12.59 |

Source: Field Survey, 2022

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Table 4. 10: History Delivery of Study Participants

| **Variable** | **Frequency (n=135)** | **Percent (%)** |
|---|---|---|
| **Number of delivered Babies** | | |
| 1 baby | 135 | 100 |
| > 1 baby | 0 | 0.0 |
| **Was your baby the gender/sex you wanted** | | |
| No | 13 | 9.63 |
| Refused | 7 | 5.19 |
| Yes | 115 | 85.19 |
| **Mode of recent delivery** | | |
| Caesarian section | 54 | 40.00 |
| Vaginal delivery | 81 | 60.00 |
| **Time spent before discharged** | | |
| Not yet discharged | 4 | 2.96 |
| Less than a week | 115 | 85.19 |
| A week or more | 16 | 11.85 |
| **Had previous miscarriages** | | |
| No | 101 | 74.81 |
| Refused | 2 | 1.48 |
| Yes | 32 | 23.70 |
| **Respondent's Number of Children** | | |
| Mean ± SD | 2.53 ± 1.50 | |
| None | 1 | 0.74 |
| 1 | 39 | 28.89 |
| 2 | 35 | 25.93 |
| >= 3 | 60 | 44.44 |

Source: Field Survey, 2022

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Table 4. 11: Infant related Information after birth

| Variable | Frequency (n=135) | Percent (%) |
|---|---|---|
| **Baby born with any malformations** | | |
| No | 116 | 85.93 |
| Refused | 1 | 0.74 |
| Yes | 18 | 13.33 |
| **Baby admitted at NICU after delivery** | | |
| No | 114 | 84.44 |
| Refused | 1 | 0.74 |
| Yes | 20 | 14.81 |
| **Complications after delivery** | | |
| No, nothing with either of us | 96 | 71.11 |
| Refused | 3 | 2.22 |
| Yes, complication with me | 25 | 18.52 |
| Yes, complication with the baby | 11 | 8.15 |
| **State Complication** | | |
| Baby difficulty in breathing | 5 | 3.70 |
| High blood pressure | 7 | 5.19 |
| Shortage of blood | 4 | 2.96 |
| Vaginal/Cervical cut | 3 | 2.22 |
| None | 100 | 74.07 |
| OTHERS (Fibroids, Anemia, Bleeding, Cervix dilation, Postpartum haemorrhage, Premature birth, Jaundice) | 16 | 4.44 |
| **Experience difficulty feeding your baby** | | |
| No | 117 | 86.67 |
| Refused | 2 | 1.48 |
| Yes | 16 | 11.85 |

Source: Field Survey, 2022

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**Appendix 1b- Specimen Data Collection Tool**

**University For Development Studies School Of Public Health Department Of Population And Reproductive Health**

Dear Respondent, I am an MPhil. in Maternal and Child Health student. This study seeks to assess the prevalence of postpartum depression (PPD) and associated factors among postpartum mothers at the Tamale Teaching Hospital, Northern Region. I will appreciate your participation in this study as it will help with designing effective interventions to improve prevention and treatment of PPD among pregnant mothers and to educate the entire population. The survey will take between 20 and 25 minutes to complete. Your responses will be kept confidential and be used solely for academic purposes.

RESPONDENT ID

DATE OF INTERVIEW

**Section A: Socio-Demographic Of Study Participants**

(Please kindly tick (√) the appropriate response)

**1. Age: _____** ➢ 18-20 **[ ]** ➢ 21-30 **[ ]** ➢ 31-40 **[ ]** ➢ 41 -50 **[ ]**

**2. Marital status:** ➢ Single **[ ]** ➢ Married **[ ]** ➢ Divorced **[ ]** ➢ Widow **[ ]**

➢ Cohabiting **[ ]** ➢ Others (specify) _____

**3. Level of education** ➢ None **[ ]** ➢ Primary **[ ]** ➢ JHS/middle sch. **[ ]** ➢

SHS/O-level/A-level **[ ]** ➢ Tertiary **[ ]** ➢ Others(specify) _____

**4. Religious Affiliation** ➢ None **[ ]** ➢ Christian **[ ]** ➢ Muslim **[ ]** ➢

Traditionalist **[ ]** ➢ Atheist **[ ]** ➢ Other (specify) _____

**5. Occupation: _____** ➢ Unemployed **[ ]** ➢Farming **[ ]** ➢Trading **[ ]**

➢ Artisan **[ ]** ➢student **[ ]** ➢ Other (specify) _____

**6. How many children do you have?**

a. 1 **[ ]**

b. 2 **[ ]**

c. 3 **[ ]**

d. 4 **[ ]**

e. 5 and above **[ ]**

**7. Residence: _____**

**8. Household size: _____**

**9. How many weeks of postpartum are you now? _____**

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**Section B – Health Systemic Factors Associated With Ppd**

Kindly thick ( √) from the following questions that applies to health systemic factors associated with PPD.

1. Antenatal clinic during pregnancy: a. Yes [ ] b. No [ ]

2. Age of pregnancy when Antenatal was started: _____

3. Number of ANC visits: _____

4. Received health professional counsel on Postpartum depression during ANC:

a. Yes **[ ]** b. No **[ ]**

5. Type of delivery: a. Vaginal delivery **[ ]** b. Caesarean section **[ ]**

6. Time stayed in hospital before discharge: _____

7. Satisfaction with health workers' attitude (in days): a. Yes **[ ]** b. No **[ ]**

8. Health facility is far from where you stay: a. Yes **[ ]** b. No **[ ]**

**Section C – Risk Factors Associated With Ppd**

Kindly thick [√] from the following questions that applies to health risk factors associated with PPD.

Was your baby born with any congenital diseases or malformations?

a. Yes **[ ]**

b. No **[ ]**

c. Refused **[ ]**

**2. Was your baby admitted at NICU?**

a. Yes **[ ]**

b. No **[ ]**

c. Refused **[ ]**

**3. Is your baby the gender/sex you wanted?**

a. Yes **[ ]**

b. No **[ ]**

c. Refused **[ ]**

**4. Was your pregnancy planned?**

a. Yes **[ ]**

b. No **[ ]**

c. Refused **[ ]**

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**5. If no, what was this pregnancy wanted?**

a. Yes **[ ]**

b. No **[ ]**

c. Refused **[ ]**

**6. Had previous miscarriages:**

a. Yes **[ ]**

b. No **[ ]**

c. Refused **[ ]**

**7. Previous history of depression:**

a. Yes **[ ]**

b. No **[ ]**

c. Refused **[ ]**

**8. Where there any complications with you or the baby during the delivery?**

a. No, nothing with either of us **[ ]**

b. Yes, complication with me **[ ]**

c. Yes, complication with the baby **[ ]**

d. Refused **[ ]**

**9. If any complication occurred state it**

**10. Had any abuse from your husband recently**

a. Yes **[ ]**

b. No **[ ]**

c. Refused **[ ]**

**11. Experiencing any sort of pressure from family members/friends**

a. Yes **[ ]**

b. No **[ ]**

**c.** Refused **[ ]**

**12. Experience difficulty feeding your baby**

a. Yes **[ ]**

b. No **[ ]**

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**c.** Refused **[ ]**

**13. What foods do you consume on a daily basis after delivery? ____**

**14. What is your daily hours of sleep during postpartum period? ___**

**15. How often do you exercise after giving birth? ___**

**Section D – Edinburgh Postnatal Depression Scale**

Tick [] either always/sometimes/not at all and if True, specify the complications or crises used under

**1. In the past week 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. No, not at all [ ]

**2. In the past week I have looked forward with enjoyment to things:**

a. As much as I ever did [ ]

b. Rather less than I used to [ ]

c. Definitely less than I used to [ ]

d. No, not at all [ ]

**3. In the past week I have blamed myself unnecessarily when things went wrong:**

a. Yes, most of the time [ ]

b. Yes, some of the time [ ]

c. Not very often [ ]

d. No, not at all [ ]

**4. In the past week I have been so unhappy that I have difficulty sleeping:**

a. Yes, most of the time [ ]

b. Yes, sometimes [ ]

c. Not very often [ ]

d. No, not at all [ ]

**5. In the past week I have felt sad or miserable:**

a. Yes, most of the time [ ]

b. Yes, quite often [ ]

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c. Not very often [ ]

d. No, not at all [ ]

**6. In the past week 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 [ ]

**7. In the last week I have felt scared or panicky for no very good reason:**

a. Yes, quite a lot [ ]

b. Yes, sometimes [ ]

c. No, not much [ ]

d. No, not at all [ ]

**8. In the past week 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 I haven't been coping as well as usual [ ]

c. No, most of the time I have coped quite well [ ]

d. No, I have been coping as well as ever

**9. In the past week I have been so unhappy that I have been crying:**

a. Yes, most of the time [ ]

b. Yes, quite often [ ]

c. Only occasionally [ ]

d. No, not at all [ ]

**10. In the past week the thought of harming myself has occurred to me:**

a. Yes, quite often [ ]

b. Sometimes [ ]

c. Hardly ever [ ]

d. No, not at all [ ]

**Thank You Very Much For Your Responses**

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**Appendix 2- Specimen Introductory Letter from Department**

UNIVERSITY FOR DEVELOPMENT STUDIES
School of Public Health

Tel : 03720 - 94080
E-Mail : sphdean@uds.edu.gh
Local : 5:7811/106.15
Internet: www.uds.edu.gh

Post Office Box TL 1883,
Tamale, Ghana, West Africa.

Office of the Dean

07/12/2021

The Chief Executive Officer
Tamale Teaching Hospital
Tamale. N/R

**LETTER OF INTRODUCTION**

***ASABEA SANDRA (UDS/MCH/0006/20)***

This is to introduce to you, Ms. Asabea Sandra, an MPH Maternal and Child Health student in the Department of Population and Reproductive Health of School of Public Health of the University for Development Studies. Ms. Asabea is currently working on her thesis titled: ***POSTPARTUM DEPRESSION AMONGST POSTPARTUM MOTHERS AT TAMALE TEACHING HOSPITAL***. Ms. Asabea wants to have access to talk to some Postpartum mothers registered in your facility to enable her carry out this important academic exercise.

I would be grateful if you could provide her with this information and any other assistance she may need.

Thank you.

OFFICE OF THE DEAN
SCHOOL OF PUBLIC HEALTH
UNIVERSITY FOR DEV T
STUDIES, TAMALE

Ruhia Abdulai
for: *Dean, SPH*

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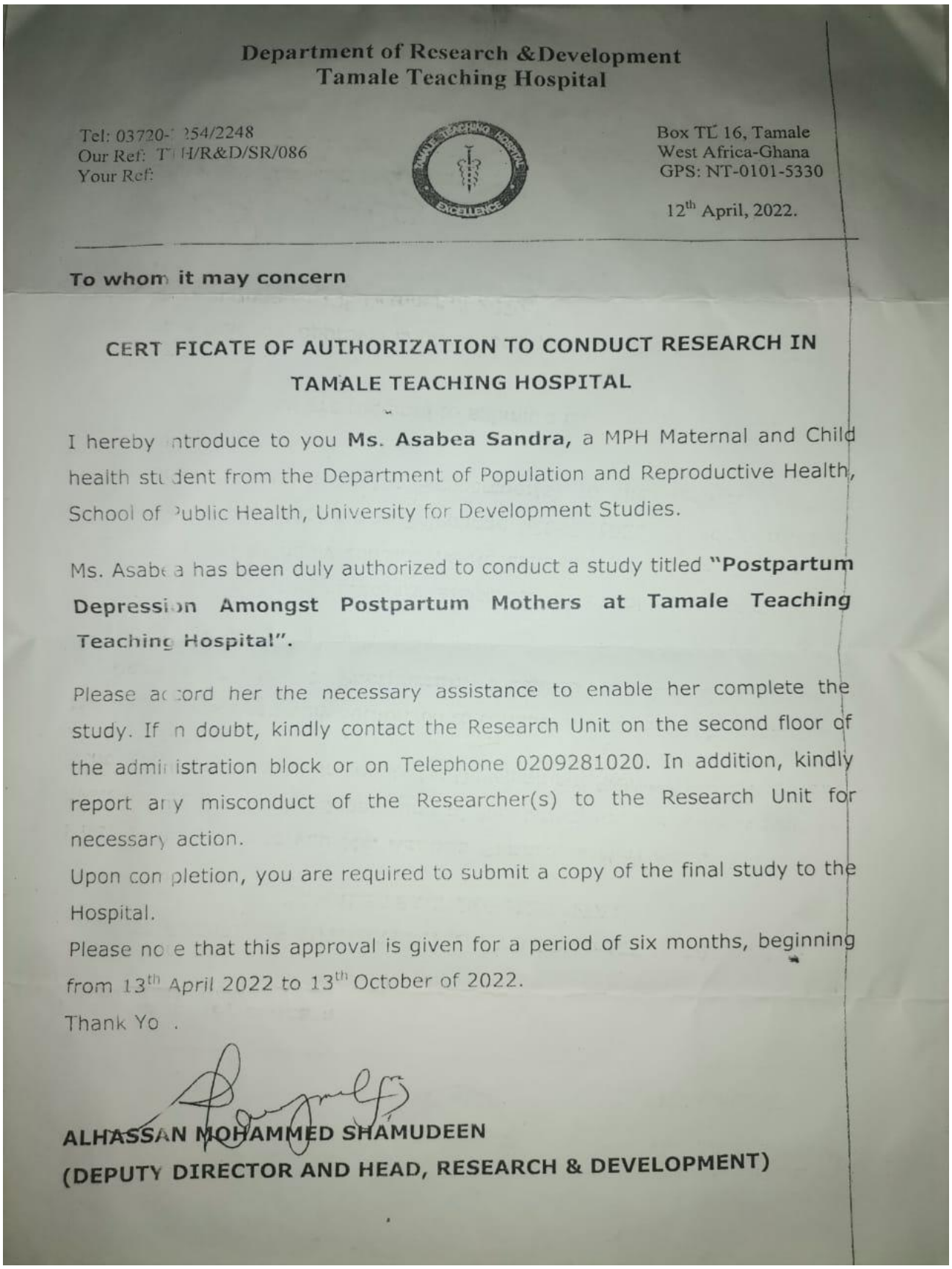
**Appendix 3- Specimen Approval Letter from Study site**



Department of Research &Development
Tamale Teaching Hospital

Tel: 03720-[illegible]254/2248
Our Ref: T[illegible]H/R&D/SR/086
Your Ref:

Box TL 16, Tamale
West Africa-Ghana
GPS: NT-0101-5330

12th April, 2022.

To whom it may concern

CERTIFICATE OF AUTHORIZATION TO CONDUCT RESEARCH IN TAMALE TEACHING HOSPITAL

I hereby introduce to you **Ms. Asabea Sandra,** a MPH Maternal and Child health student from the Department of Population and Reproductive Health, School of Public Health, University for Development Studies.

Ms. Asabea has been duly authorized to conduct a study titled **"Postpartum Depression Amongst Postpartum Mothers at Tamale Teaching Teaching Hospital".**

Please accord her the necessary assistance to enable her complete the study. If in doubt, kindly contact the Research Unit on the second floor of the administration block or on Telephone 0209281020. In addition, kindly report any misconduct of the Researcher(s) to the Research Unit for necessary action.

Upon completion, you are required to submit a copy of the final study to the Hospital.

Please note that this approval is given for a period of six months, beginning from 13th April 2022 to 13th October of 2022.

Thank You.

**ALHASSAN MOHAMMED SHAMUDEEN**
**(DEPUTY DIRECTOR AND HEAD, RESEARCH & DEVELOPMENT)**

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## Appendix 4 - Specimen Ethical Clearance

# UNIVERSITY FOR DEVELOPMENT STUDIES

Tel: 03720-93382/26631/22078
Email: registrar@uds.edu.gh
Website: www.uds.edu.gh
P. O. Box TL 1350
Tamale, Ghana

Our Ref: UDS/RB/068/22

Your Ref:.....

OFFICE OF THE REGISTRAR

Date: 29TH AUGUST, 2022.

**SANDRA ASABEA,**
**POPULATION AND REPRODUCTION HEALTH,**
**SCHOOL OF PUBLIC HEALTH,**
**UNIVERSITY FOR DEVELOPMENT STUDIES,**
**TAMALE.**

**ETHICAL APPROVAL NOTIFICATION**

With reference to your request for ethical clearance on the research proposal titled "**Prevalence of Postpartum Depression and associated Factors Among Postpartum Mothers at the Tamale Teaching Hospital, Ghana**" I write to inform you that the University for Development Studies Institutional Review Board (UDSIRB) found your proposal including the consent forms to be satisfactory and have duly approved same. The mandatory period for the approval is six (6) months, starting from 29th July 2022 to 29th December, 2022.

Subject to this approval, you are please required to observe the following conditions:

1. That the anonymity of the respondents shall be guaranteed as mentioned in the consent forms.
2. That you will acknowledge the source of the data collected in any publication related to this research.
3. That you will submit a field report and a copy of the research report to the UDSIRB.
4. That you may apply to the UDSIRB for any amendments relating to recruiting methods, informed consent procedures, study design and research personnel.
5. That you will strictly abide by the code of conduct of this University.

Please do not hesitate to refer any issue (s) that you may deem necessary for the attention of the Board.

Thank you.

Prof. Herbert Kwabla Dei
*Chairman, UDSIRB*
*Cc: file*