Prevalence and Correlates of Postpartum Depression among Nursing Mothers within the Kumasi Metropolis: An Analytical Cross-sectional Study

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Abstract

Background: Postpartum depression is a mood disorder produced by changes in brain chemistry among women, beginning 4-6 weeks postpartum and lasting up to a year. This maternal mental health problem affects 11-42% of postpartum women globally with a reported prevalence of 60.8%, causing severe health implications to both the mother and the baby. In developing African countries like Ghana, maternal mental health is generally neglected during the postpartum period, and consequently, their specific symptoms are often undetected. This study aimed at estimating the point prevalence of postpartum depression and determining the socio-demographic and social support variables associated with postpartum depression

Methods: This research employed an analytical cross-sectional design and a Quantitative Approach. A purposive sampling technique was used in recruiting the respondents involved in the study through the help of the management of the health facilities. Data collection tools were the Edinburgh Postnatal Depression Scale (EPDS) and a structured questionnaire. Data Analysis was performed using Binary Logistic Regression tests in Stata (Version 17.0).

Results: A total of 274 mothers participated in the study. Prevalence of Postpartum Depression was estimated at 31.39%, the circumstance surrounding pregnancy (i.e. wanted/unwanted pregnancy, planned/unplanned pregnancy, denied by father/abandonment) was the only socio-demographic correlate to PPD [p=0.015, OR=0.805, 95% CI 0.675 − 0.959]. Social support variables showing significant association with PPD were partner support [p=0.005, OR=1.357 95% CI 1.096 − 1.682], the experience of social pressure [P=0.002, OR=0.713 95% CI 0.575 − 0.884], and the ability to maintain a fair life balance in the postpartum period [P=0.011, OR=0.752 95% CI 0.603 − 0.936].

Conclusions: This study identified the demographic and social factors to developing PPD that should serve as pointers to medical professionals when evaluating postpartum women. Once these indicators are recognised, there is a higher likelihood toimprove overall maternal mental health and reduce the prevalence of postpartum depression through psychosocial support, in-service training of primary health care workers on PPD Screening, education on maternal psychological and emotional needs and Public maternal mental health campaigns.

Introduction

In contemporary society, motherhood is often a major change in career and lifestyle for many women. The birth of a new born is usually regarded as a happy occasion and it is expected that the new mother will welcome it with delight. However, this is not always the case for some women. After the birth of their child, they experience a downward trajectory, feeling gloomy and sombre while their family and friends celebrate [1].

Postpartum Depression (PPD) is a form of mood disorder produced by changes in brain chemistry, and a medical condition requiring professional treatment [2]. It is highly prevalent within the first few months up to a year after birth. However, studies have proven that postpartum depression can continue up to four years following birth [2].

PPD is characterized by extreme sadness, loss of interest and pleasure in previously enjoyed activities, fatigue, restlessness, a sense of guilt or worthlessness, difficulty concentrating and making decisions, sleeplessness, and repeated thoughts of death or suicide. In some cases, the mother may overly be concerned about the health of her child, other mothers with severe PPD experience psychotic symptoms such as hallucinations or delusions, posing a modest but genuine risk of harming their children [3].

Although the exact aetiology of PPD is unknown, biological, psychological, and social precursors have been reported as risk factors for all women in developing the condition [4]. PPD can be caused by physiological, situational, or multifactorial factors. Few studies have reported a range of socio-demographic factors to predict PPD including low-income levels, employment status, level of education, and mother's age [5] although some research findings disagree with these outcomes [6]. Other studies have revealed that parity, the circumstance surrounding pregnancy, and the type of birth/delivery were associated with PPD [7, 8, 9].

Similarly, low socioeconomic status and lack of education were also found as the most common factors linked to PPD with the lack of social support being a stronger psychological factor as well as low self-esteem, stressful life events, unplanned pregnancy or an effort to terminate the pregnancy and unfavourable feelings about the new born [10]. Economic factors (i.e. housing concerns and financial problems), previous maternal health problems, frequent conflicts with family members, and inadequate access to information and other forms of technical support, were linked to depression in the second month postpartum.

Depression is common among women of childbearing age. In developed countries, about 10 to 16% of adult mothers, experience depression and 25–50% of affected women have prolonged symptoms lasting longer than 6 months [11, 12]. Two studies conducted in Brazil revealed a prevalence of 12% (n = 33) and 13.3% (n = 120) of depression in the third month postpartum [10]. A recent Australian study found that 16.1% of women reported depressive symptoms during the first 12 months postpartum [13]. In the United States, PPD prevalence is between 10% and 20% [14] and 7–16% in Germany [15]. A meta-analysis found the prevalence of PPD in Asia to be one in 20 women [16].

It was believed for a long time that only women from western societies suffered from PPD and that postnatal mood disorders were defined by culture. However, these maternal mental conditions have also been identified in other settings. In Africa, 18.3% of mothers have been estimated to have depression according to a systematic review of 35 studies [17, 18]. A study conducted in a tertiary hospital in Nigeria indicated that the incidence of PPD was 27.2% [19]. In Uganda, a prevalence of 6.1% was reported in peri-urban communities using the Self Reporting Questionnaire (SRQ-20) tool and another study using the Edinburgh Postnatal Depression Scale (EPDS) reported a prevalence of 43% in rural Uganda [20, 21].

Two community-based research in the Northern parts of Ghana estimated the prevalence of PPD to be 27.8% in 2016 [22] and 33.5 percent in 2018, [23] while other studies on women in the remaining parts of Ghana found lower rates of 3.8–11.3% [24].

PPD is a serious public health problem in all parts of the world, that affects both the mother's health and the development of the infant [10]. It has the significant ability to negatively affect the mothering role and function of a woman [25]. In children and adolescents, untreated depression can have adverse long-term effects such as the development of maladjustment and poor general physical wellness [12]. For the mother, the episode can be the precursor of chronic recurrent depression and may carry life-long consequences for her and her family [26].

The global population dealt with unprecedented social, economic, and healthcare challenges during the COVID-19 pandemic. In terms of mental health, the COVID-19 pandemic remarkably affected countries worldwide, with an increase in the prevalence of anxiety, stress, and depression [27]. Women, especially pregnant women and those in the postpartum were most susceptible to mental health problems [28].

The challenging times that came as a result of the pandemic such as social distancing, government-enforced lockdowns, and the use of personal protective equipment (PPEs) during labour led to job loss, high levels of fear, limited social support and access to healthcare which adversely affected the childbirth experience and mental wellbeing of postpartum women [29, 30]. As a result, most studies demonstrated an increase in the rates of PPD and other birth-related psychopathologies worldwide such as postpartum anxiety and psychosis [31, 32].

A current meta-analysis of COVID-19's effects on maternal health discovered an increased prevalence of PPD throughout the pandemic [33, 34]. These findings prove the vulnerability of postpartum mothers in developing psychological and emotional disorders during stressful life events. A cross-sectional study of mothers six weeks postpartum in Germany reported the prevalence of depressive symptoms to be 26% post-COVID-19 which is significantly higher than 12%, the previous year [35]. In turkey, PPD prevalence was found to be 34%, and 33.71% in China [36]. Gradually, however, the debilitating fear of COVID-19 decreased with more information and made room for adaptation to life during the pandemic [37].

In developing countries, where mental health is generally ignored and perceived with a negative attitude [38], PPD is often overlooked and misdiagnosed. Most vulnerable women are rarely recognized during pregnancy or after delivery since most attention is on the infant's health, thus they do not always receive the necessary care [39].

Hence it becomes imperative that the symptoms and risk factors of PPD be reliably identified for clinical or public health intervention in an effort to expand perspective and understanding of Postpartum risk, in Ghana and sub-Saharan Africa concerning Postpartum Depression by providing relevant insight into the association of social correlates and socio-demographic variables in Postpartum etiology.

Methods

An analytical cross-sectional design was used for this study. The study site was the Kumasi Metropolitan Area. Three public sub-metropolitan Hospitals (Kumasi South, Suntreso and Manhyia Government Hospitals) were purposively selected for the study. These hospitals are the major health facilities in the sub-metropolitan health directorates, serving as referral centers for the health facilities

within the sub-metropolitan areas. The selected hospitals run postnatal and child welfare clinics, as well as psychiatric clinics throughout the weekdays.

The sample size for this study was determined using Cochran's formula; $n = Z^2 \frac{p(1-p)}{d^2}$

for when population size is unknown [40]. Where;

• n is the estimated sample size;

• Z is the z-score at a confidence level of 95% = 1.96;

• p is the estimated prevalence;

• d is the level of precision corresponding to a confidence level of 95%= 0.05

The estimated prevalence in calculating the sample size was selected from a systematic review

conducted in sub-Saharan Africa to determine the effect of postpartum depression on exclusive breastfeeding, which estimated the prevalence of postpartum depression at 18.6% [41]. Given these values, the sample size was calculated as;

$$n = 1.96^2 \times \frac{0.186\,(1 - 0.186)}{0.05^2}$$

,

$$n = 3.8416 \times \frac{0.151404}{0.0025}$$

,

$$n = 233.$$

Hence, the minimum sample size for the study was 233. However, a total number of 274 consenting postpartum women were recruited.

Inclusion Criteria for Women

Women were eligible to participate in this study if they were nursing mothers with children less than one-year-old at the time of the study. Women who were not biological mothers of the infant or were pregnant at the time the study was conducted were excluded from the study. Women who lived within the Kumasi Metropolis and were attending postnatal care (PNC) at the selected hospitals were included in the study. Those who were not of childbearing age or who experienced stillbirth or had infants under neonatal intensive care were excluded while women who brought the children for Child Welfare Clinics (CWC) visits were included in the study. The total number of nursing mothers was further divided and recruited among the three selected health facilities using the probability proportional to size technique. The number of respondents from each hospital is illustrated in Table 1.

Table 1
Sample Composition of Selected Health Facilities

Name of Hospital	Frequency (n = 274)	Percentage (%)
Kumasi South Government Hospital	117	42.70
Suntreso Government Hospital	63	22.99
Manhyia Government Hospital	94	34.31

Data collection tools used were the Edinburgh Postnatal Depression Scale (EPDS) and a structured questionnaire. The structured questionnaire was used to collect socio-demographic and social support data from respondents. The EPDS was used to screen for depression among postpartum women at the selected hospitals. The EPDS is a 10-item self-report scale that has been well-validated

and widely used internationally by child and family nurses and other healthcare professionals in primary care settings to screen for the presence of depression.

Validation studies have demonstrated 68–86% sensitivity and 78–96% specificity. Positive predictive value has been reported between 70–90% [42]. Both data collection tools; a structured questionnaire and EPDS used for this study were administered in person to our respondents at the end of their postnatal or child welfare care session. Data Analysis was performed using Logistic Regression tests with the aid of Statistics/Data Analysis (Stata Corp, Version 17.0).

Results

Test for Normality of Data

A Quantile-Quantile (Q-Q) Plot was used to determine whether the dependent variable (*i.e.*, post-partum depression) was normally distributed such that parametric tests could be used for the analysis of data. The results shown in Fig. 1 indicate that the data was normally distributed.

Socio-demographic Characteristics of Respondents

The mean age of mothers was 29 years while the mean parity and number of children among nursing mothers were both found to be 2. Mothers were found to have a monthly income of GHC 762.00 on average with more than half (58.03%) reporting to be self-employed. The majority of mothers had attained secondary education (38.32%). More than half of the respondents were married (66.79%). Majority of mothers reported to have had a normal vaginal delivery (74.82%) and had never had a spontaneous abortion during any prior pregnancies (79.20%) as shown in Table 2.

Table 2
Demographic Characteristics of Respondents

VARIABLE	MEAN (SD)	MINIMUM VALUE - MAXIMUM VALUE
Age	29 (6.11)	16−45
Monthly Income(GHS)	762 (856.31)	100−7000
Parity	2 (1.47)	1−9
No. of Children	2 (1.45)	1−8
	FREQUENCY (n = 274)	PERCENTAGE (%)
Marital Status		
• Single/Cohabiting	51	18.61
• Single	35	12.77
• Married	183	66.79
• Married but not Cohabiting	3	1.09
• Divorced	1	0.36
• Widowed	1	0.36
Highest Level of Education		
• Basic	92	33.58
• Secondary	105	38.32
• Tertiary	54	19.71
• None	23	8.39
Occupation		
• Self-employed	159	58.03
• Apprenticeship	21	7.66
• Student	12	4.38
• Unemployed	36	13.14
• Government Sector Employee	32	11.68
• Private Sector Employee	14	5.11
Circumstance Surrounding Pregnancy		
• Unplanned	117	42.70
• Unwanted	6	2.19
• Denied by Father/Abandonment	5	1.82
• Planned	146	53.28
Nature of Birth		
• Vaginal Delivery	205	74.82
• Emergency Caesarean	54	19.71
• Planned Caesarean	15	5.47

VARIABLE	MEAN (SD)	MINIMUM VALUE - MAXIMUM VALUE
Spontaneous Abortion		
• Yes	57	20.80
• No	217	79.20

Prevalence of Postpartum Depression among Nursing Mothers

The EPDS was administered to respondents and used to determine the prevalence of postpartum depression. For this research, all scores of responses provided on the scale which totaled less than 10 (less or equal to 9), were categorized as *'Normal'*, all scores which totaled between 10 and 13, were categorized as *'Possible Depression'*, and scores totaling greater than 13 were categorized as *'Depressive Illness'*. These categories were further sorted into *'Depressive illness'* and '*Normal'* to aid in binary logistic regression tests as shown in Table 3.

Table 3
Prevalence of Postpartum Depression Using Edinburgh
Postnatal Depression Scale

Classification of Depression	Frequency (n = 274)	Percentage (%)
Depressive Illness	86	**31.39***
Possible Depression	40	14.60
Normal	148	54.01

***Percentage of Depressive Illness indicates the Prevalence rate for Postpartum Depression

Thus, the point prevalence of postpartum depression among nursing mothers within the Kumasi Metropolis was estimated to be 31.39%.

Socio-Demographic Variables and Postpartum Depression

In a bivariate logistic regression analysis, two socio-demographic variables showed a negative significant association with postpartum depression at the crude level; marital status [p = 0.038, OR = 0.728 95% CI 0.539–0.983] and circumstance surrounding pregnancy [p = 0.015, OR = 0.805, 95% CI 0.675–0.959] as shown in Table 4. These variables were further examined in a multivariate logistic regression model, and after adjusting for other independent variables, only circumstance surrounding pregnancy [p = 0.046; AOR = 0.832; 95% CI 0.0694– 0.997], retained the strongest significant association with postpartum depression as illustrated in Table 5. The following socio-demographic variables did not show any significant association with postpartum depression; age, education, occupation, marital status, nature of birth, parity, number of children, and income.

Table 4
Binary Logistic Regression Analysis Results of Socio-Demographic Variables

Variables	Postpartum Depression (PPD)		
	Crude p-value	Standard Error	Odds Ratio [95% CI]
Age	0.564	0.021	0.988 [0.947–1.030]
Education	0.835	0.143	1.029 [0.783–1.353]
Occupation	0.072	0.083	1.143 [0.988–1.322]
Marital Status	**0.038***	0.112	**0.728 [0.539–0.983]**
Circumstance of Pregnancy	**0.015***	0.072	**0.805 [0.675–0.959]**
Nature of Birth	0.441	0.198	0.832 [0.521–1.328]
Parity	0.967	0.089	1.003 [0.843–1.195]
Spontaneous Abortion	0.722	0.283	0.893 [0.480–1.663]
No. of Children	0.536	0.087	0.945 [0.789–1.131]
Monthly Income	0.712	0.000	0.999 [0.999–1.000]

Table 5
Showing Multivariate Logistic Regression Analysis Results of socio-demographic variables

Variables	Postpartum Depression (PPD)		
	Adjusted p-value	Standard Error	Adjusted Odds Ratio [95% CI]
Marital Status	0.127	0.124	0.786 [0.577–1.071]
Circumstance of Pregnancy	**0.046***	0.076	**0.832 [0.694–0.997]**

Social Support Variables and Postpartum Depression

In a bivariate logistic regression analysis as shown in Table 6, the social support variables showing significant association with postpartum depression at the crude level were family support of motherhood journey [p = 0.001, OR = 1.348 95% CI 1.123–1.619], support with house chores [p = 0.016, OR = 1.248, 95% CI 1.042–1.495], partner support [p = 0.000, 0R = 1.430, 95% CI 1.192–1.716], financial support [p = 0.000, OR = 1.494, 95% CI 1.209–1.847], social pressure experience [p = 0.000, OR = 0.612, 95% CI 0.519–0.735], Inability to complain, [P = 0.000, OR = 0.713 95% CI 0.595–0.853], Constantly feeling drained/exhausted [p = 0.002, OR = 0.747 95% CI 0.621–0.899], Ability to maintain a fair balance in life [p = 0.000, OR = 0.656 95% CI 0.541–0.796], Occurrence of a drastic life event [p = 0.001, OR = 0.705 95% CI 0.569–0.872].

Of these variables, family support in the motherhood journey, support in household chores, partner's support, and financial support showed a positive crude association with postpartum depression while as the experience of social pressure, inability to complain, constantly feeling drained, ability to maintain a fair life balance, and occurrence of a drastic life event showed a negative crude association with postpartum depression.

Table 6
Binary Logistic Regression Test Results of Social Support Variables

Variables	Postpartum Depression (PPD)		
	Crude p-value	Standard Error	Odds Ratio [95% CI]
Family Support of Motherhood Journey	0.001*	0.126	1.348 [1.123– 1.619]
Support with house chores	0.016*	0.115	1.248 [1.042– 1.495]
Performing chores alone	0.067	0.073	0.855 [0.724–1.011]
Partner Support	0.000*	0.133	1.430 [1.192–1.716]
Financial Support	0.000*	0.162	1.494 [1.209–1.847]
Presence of a house help	0.937	0.118	1.009 [0.802–1.270]
Social Pressure Experience	0.000*	0.055	0.612 [0.519–0.735]
Inability to complain	0.000*	0.065	0.713 [0.595–0.853]
Constantly feeling drained/exhausted	0.002*	0.070	0.747 [0.621–0.899]
A fair balance in life	0.000*	0.065	0.656 [0.541–0.796]
Occurrence of drastic event	0.001*	0.077	0.705 [0.569–0.872]
Main support	0.151	0.153	0.744 [0.496–1.114]

Following a further multivariate logistic regression analysis, while adjusting for other independent variables, Partner Support [p = 0.005, OR = 1.357 95% CI 1.096–1.682], Social Pressure Experience [P = 0.002, OR = 0.713 95% CI 0.575–0.884], and the ability to maintain a fair balance in life [P = 0.011, OR = 0.752 95% CI 0.603–0.936] retained the strongest significant association with postpartum depression. Whereas the experience of social pressure and the ability to maintain a fair life balance showed a negative association, proving to be low-risk factors associated with depression when experienced at reduced rates, partner support showed a positive association, indicating a high-risk factor to developing PPD when experienced at reduced rates as shown in Table 7.

Table 7
Showing Multivariate Logistic Regression Analysis Results of social support variables

Variables	Postpartum Depression (PPD)		
	Adjusted p-value	Standard Error	Adjusted Odds Ratio [95% CI]
Family Support of Motherhood Journey	0.258	0.226	1.231 [0.859– 1.763]
Support with house chores	0.475	0.162	0.877 [0.611– 1.258]
Partner Support	0.005*	0.148	1.357 [1.096–1.682]
Financial Support	0.539	0.149	1.088 [0.831– 1.424]
Social Pressure Experience	0.002*	0.078	0.713 [0.575–0.884]
Inability to complain	0.244	0.096	0.881 [0.712–1.089]
Constantly feeling drained/exhausted	0.827	0.122	1.026 [0.813–1.295]
A fair balance in life	0.011*	0.084	0.752 [0.603–0.936]
Occurrence of drastic event	0.079	0.099	0.804 [0.629–1.025]

Tables 8 and 9 show the categorisation of items enlisted under the variables *Occurrence of Drastic Event* and *Main source of social support in the postpartum* as included in the questionnaire.

Table 8
Types of Drastic Life Event Encountered Postpartum

Type of drastic event	Frequency (n = 274)	Percentage (%)
Loss of a loved one	42	15.33
Loss of job	29	10.58
Loss of property	10	3.65
None	193	70.44

Table 9
Main Source of Social Support Postpartum

Source of Main Support	Frequency (n = 274)	Percentage (%)
Friends	10	3.66
Parents	59	21.61
Partner	183	67.03
Siblings	21	7.69

Discussion

This study found the prevalence of PPD to be 31.39% among nursing mothers within the Kumasi Metropolis. The correlates of PPD were found to be circumstances surrounding pregnancy, partner support, ability to maintain a fair life balance, and experience of social pressure.

Prevalence of Postpartum Depression

A greater prevalence rate was reported by a meta-analysis review of 35 studies revealing that at least, 18.3% of mothers have been estimated to have depression in Africa [17]. A lower prevalence rate was reported by a study in Northern Ghana [22] which found a prevalence of 27.8%. A close prevalence of 33.5%, similar to this study was reported in 2018 [23]. Other studies on women of childbearing age living in the remaining parts of Ghana, surprisingly contradict these findings by reporting to have found much lower rates of 3.8–11.3% [24].

Similarly, a study conducted in a tertiary hospital in another African country like Nigeria indicated that the incidence of postpartum depression was 27.2% [19]. A cross-sectional study reported an even greater prevalence rate of 44.39% of PPD in Jos, Nigeria using the Edinburgh Postnatal Depression Scale (EPDS) and a 23% prevalence rate in Lagos [43].

A study conducted in the peri-urban areas of Uganda reported a lower prevalence of 6.1% using the Self Reporting Questionnaire (SRQ-20) tool whereas interestingly, another study in rural Uganda reported a higher prevalence of 43% using the Edinburgh Postnatal Depression Scale (EPDS) [20, 21].

Variations in the rates of PPD prevalence may be attributed to the different instruments used in these studies as compared to other studies, modification and interpretation of items listed in screening tools, the lived experiences of the mother, social class and status, social, cultural and economic differences, the sample sizes, prior history of depression in the perinatal period and the exact point in the postpartum period the studies were conducted.

Socio-demographic and Social Support Correlates of PPD

This study found that the circumstance surrounding pregnancy, partner support, the ability to maintain a fair life balance, and the experience of social pressure were independently associated with postpartum depression. Some studies have found factors with increased risk of depression to be unplanned pregnancy and unwanted pregnancy being one of the significant factors to increase EPDS scores [4]. Others reported that respondents who had unplanned pregnancies were two times more likely to develop postpartum depression than those women who had planned pregnancies [42]. Women whose pregnancy was denied were 3.39 times more likely to have PPD [10].

Concerning Partner Support, previous studies have revealed that the inability to confide in a partner or spouse has increased the risk of developing depression in the postpartum period [42]. Furthermore, conflict and poor relationship with partner was found to significantly affect PPD [44]. Partner support can be viewed from different perspectives; it can be economic, such as contributing or covering expenses towards child rearing, it could be related to the father's acceptance of the baby as his child, and also help with household chores and child care. Mothers constantly need their partners to particularly share chores, largely because any additional task to infant care can overwhelm them [4].

The lack of the father's support was the basis of many risk factors identified by several studies and in any case, the role of the partner's support in preventing and alleviating postpartum depression is extremely crucial, especially in the African context [42]. Additionally, women who had essential support from the father of the baby, especially after delivery were 5.8 times less likely to develop postpartum depression than those who had no partner support and mothers who did not have support from their partner or the father of the baby had higher odds of experiencing PPD [45]

This current study found that such social pressure and the ability of the mother to maintain a fair life balance in the middle of society's expectations showed a negative association with PPD, indicating that women who perceived to be under a lot of pressure and could not maintain a fair life balance were at a higher risk of developing PPD. The intense involvement of parents-in-law and the expectation to meet traditional obligations and perform gender roles adequately are the main contributors to postpartum depression [46].

In Africa, certain birth and postpartum activities are imposed on the new mother. This is characterised by compulsory and strict dietary plans, uncomfortable tummy bonding, frequent sitting on hot water and other restrictions. This usually continues for up to six months postpartum or longer. In the course of these months, conflicts with parents or other family members may arise largely because nursing mothers have a different lifestyle and will want to raise their children differently leading to disagreements with traditional expectations of the mother, which put them at a higher risk of developing PPD [47].

LIMITATIONS

A large population of nursing mothers were illiterate and so, the interpretation of the questions into local languages produced errors in data collection and data entry into the analysis software. Factors such as the existence of psychiatric problems before pregnancy and the presence of depression throughout the perinatal period were not assessed.

Conclusions

The prevalence of postpartum depression and its effect so far as women of childbearing age are concerned will continue to increase if not adequately addressed with utmost urgency. This will be evident in the deteriorating states of maternal mental health among women in their postpartum periods, especially in third-world countries like Ghana.

This study has identified the sociodemographic and social factors to developing PPD that should be pointers to medical professionals when evaluating a patient. Once these indicators are recognised among postpartum women, there is a higher likelihood that PPD is present. To improve overall maternal mental health and reduce the prevalence of postpartum depression, appropriate social or psychological support should therefore be provided. These include in-service training of primary health care workers PPD Screening, education on maternal psychological and emotional needs and Public maternal mental health campaigns.

Abbreviations

ANC – Antenatal Care

CWC – Child Welfare Clinic

DSM-IV – Diagnostic and Statistical Manual

EPDS – Edinburgh Postnatal Depression Scale

GHS – Ghana Health Service

GSS – Ghana Statistical Service

MDE – Major Depressive Episode

MHA – Mental Health Authority

MHA – Mental Health America

MMH – Maternal Mental Health

PDSS – Postnatal Depression Screening Scale

PNC – Postnatal Care

PND – Postnatal Depression

PPD – Postpartum Depression

WHO – World Health Organisation

Declarations

- **Ethics Approval and Consent to Participate**

Letter of Approval to conduct study was obtained from the Management of the selected health facilities. Ethical Approval was granted by the Committee on Human Research Publication and Ethics at the Kwame Nkrumah University of Science and Technology, Kumasi-Ghana with reference number CHRPE/AP/440/22. Ethical principles such as anonymity, informed consent and confidentiality were employed throughout the study. An informed consent form and participants' information leaflet was signed by each respondent before the administration of the questionnaire.

- **Consent for Publication**

Not Applicable.

- **Availability of Data and Materials**

The datasets supporting the conclusions of this article will be made available upon request.

- **Competing Interests**

The authors declare that they have no competing interests.

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- **Authors' Contributions**

FP designed the study and wrote the draft of manuscript. EH and FP collected and analysed the data. FP proofread and revised the manuscript. EAB supervised all research procedures. EAB and AP reviewed the final manuscript. All authors approved the final manuscript.

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Figures
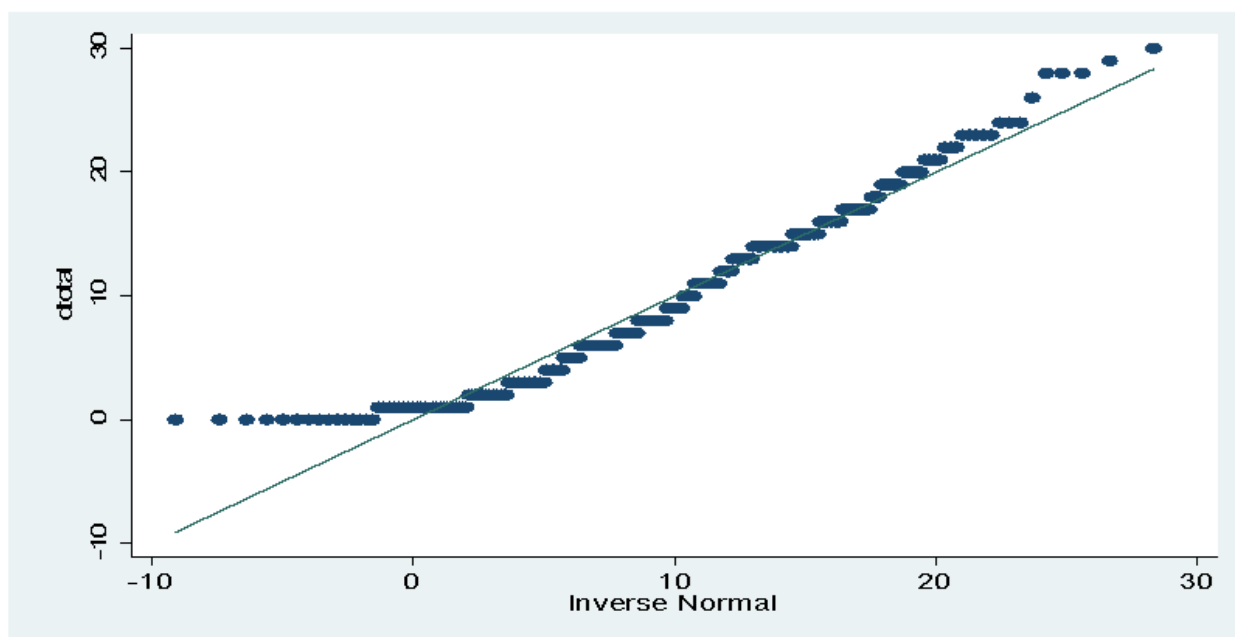
Figure 1

Showing the normal distribution of data on the dependent variable.