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Postpartum depression: The prevalence and associated factors among women attending postnatal clinics in the Bawku municipality, Upper East Region of Ghana

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Abstract

Introduction: This study examined postpartum depression (PPD) among mothers in the Bawku municipality of Ghana, aiming to assess its prevalence and associated risk factors.

Methods: A total of 242 women, 2–12 weeks postpartum, were randomly recruited for this cross-sectional analytical study. The Edinburgh Postnatal Depression Scale was used for depression screening, and multivariate logistic regression analysis was employed to assess the factors associated with PPD.

Results: The study showed that 34.7% of the postpartum mothers were within the age range of 25–29, with a mean age of 27.9 (standard deviation [SD] ± 6.33). The prevalence of PPD was 50.4% (95% confidence interval [CI] 43.9–56.9). Several significant risk factors were identified, including inadequate prenatal visits (adjusted odds ratio [aOR] = 13.44, 95% CI 3.66–49.37, P < 0.001), obstetric complications (aOR = 3.39, 95% CI 1.23–11.19, P = 0.019), less than 3 weeks postpartum (aOR = 8.14, 95% CI 1.95, 33.94, P = 0.004), 6–8 weeks postpartum (aOR = 7.72, 95% CI 1.71–34.80, P = 0.008), and stressful life events (aOR = 3.30, 95% CI 1.23–8.89, P = 0.018).

Conclusion: The study concluded that the prevalence of PPD in the Bawku municipality is higher than previously reported in Ghana, emphasizing the need for early identification of pregnant women at risk for PPD.

KEYWORDS
depression, EPDS, postnatal, postpartum, prevalence

INTRODUCTION

Postpartum depression (PPD) is the most frequent mental disorder during the perinatal period and a substantial public health concern in low- and middle-income countries (LMICs). It affects one out of every nine new mothers after childbirth, with a global frequency of 10%–15%, which considerably higher in LMICs.[1] Approximately 20%–40% of women in LMICs experience depression before or during the postpartum period.[2] Evidence shows that there is a wide variation in the prevalence of PPD across countries, ranging between

8% and 54.5%.[3–5] The reasons for this divergence in the prevalence rate of PPD have been attributed to the transcultural variations in interpreting the symptoms and the differences in health-seeking behaviors across these regions.[6,7] Existing evidence indicates that PPD has negative effects on the growth and development of the child[8,9] and the mother–infant relationship.[10] Thus, it is crucial to ensure timely identification and management of PPD to improve general maternal health and reduce infant and child mortality.[9] However, despite the common occurrence of PPD, it often goes undiagnosed in many settings.[8]

For many women, the postpartum period can be a time of vulnerability to distress. Postpartum mental health issues are often difficult for parents of the newborn to deal with and can have substantial short- and long-term consequences for newborns. Suicide, as well as infanticide occur, though rarely. The cost implications on healthcare systems are enormous.[11]

The prevalence of this condition has been found to differ in different communities within Africa. For example, in Ethiopia, prevalence was found to be 15.6% in the Debre, Berhan district[12] and 23.7% in the Ankesha district.[13] A systematic review of the condition in Africa found prevalence ranging from 6.9% to 50.1% depending on which instrument was used for screening.[14] In Ghana, the country-specific prevalence was 7%.[15] Several studies within the country have reported higher prevalence rates than the national average.[16-18] A typical case is noted by Saeed et al., whose assessment of depression among mothers of children under five months in the Bole district revealed a 16.8% prevalence rate.[16]

A multitude of biological, psychological, and social factors have been found in previous studies to be linked to the development of PPD.[19,20] Poverty, lack of social support, intimate partner violence, a history of pregnancy loss, and unintended pregnancy, all of which are common in LMICs, are risk factors for PPD.[21] Obstetric complications,[22] single marital status,[23] and low income[24] have also been found to be contributory factors to PPD. An unusually high prevalence of depression was observed among mothers who were HIV positive (48%) in Kenya[25] among pregnant adolescents (58%),[26] and among mothers who have malnourished babies in Nairobi (66%).[27]

In 2015, the global strategy for women's, children's, and adolescent health (2016–2030) recommended screening and management of PPD as key postnatal interventions for maternal and child health.[28] In some LMICs, such as Ghana, where there are limited resources, the country grapples with fewer mental health professionals,[29] therefore uncovering the predictors of PPD allows close follow-up and targeted screening of at-risk mothers.

Identifying risk factors for PPD is critical, particularly in terms of directing effective screening for the disorder.[30] In Ghana there are limited studies on PPD, and some of the few studies have been conducted in the southern part of the country.[16,31] Identifying a population of women at risk is important to raise awareness and plan preventive strategies to avert the occurrence of PPD among vulnerable women. Moreover, like other mental disorders, the magnitude of PPD is not known in the current study setting. This study aimed to assess the prevalence and associated risk factors of PPD among mothers attending postnatal clinics in the Bawku municipality in the Upper East Region of Ghana.

METHODS

This study used a cross-sectional analytical study design to determine the prevalence and associated risk factors of PPD among mothers.[32] The study was conducted in the Bawku municipality in the Upper East Region of Ghana, which has a population of 119,458 as per the 2021 census, from mid-October to mid-November 2021. This region is inhabited predominantly by the Kusaasis and the Mamprusis, with other minority tribes such as the Bisas, the Bimobas, and the Mossis. For some time, there has been a tribal conflict between the Kussaasis and the Mamprusis that has created a state of instability in the community. There seemed to be relative peace in the community at the time this study was carried out.

The municipality is made up of seven health facilities, which all provide postnatal care, out of which four facilities were randomly selected for the study. The study included 2–12 weeks postpartum mothers attending postnatal clinics in the selected facilities. We excluded acutely ill postpartum mothers, mothers with known mental health conditions, and mothers who were bereaved within the past month.

The sample size for the study was determined using statistical power analysis.[33] G*Power version 3.1.9.2 guided the sample size calculation. Preliminary power analysis by z tests calculation considering $Pr(Y = 1 | X = 1)$ H0 to be low at 0.07 and $Pr(Y = 1 | X = 1)$ H1 to be higher at 0.20, an α of 0.05, a power (1-βerr prob) of 0.80, $R^2 = 0.04$, and the sample size needed using G-Power 3.1.9.2 was approximately 232. Finally, the sample size for the study was 255 considering a 10% nonresponse rate. This value was then distributed proportionally to the health facilities depending on the population of mothers who attended the postnatal clinics. Mothers who attended the postnatal clinic for immunization or routine check-up of their newborn babies at the time of the study were recruited through systematic random sampling where a coin was tossed to select the first person and subsequently every third mother in the queue awaiting her turn was recruited after consent was obtained using a sampling interval of three. To collect data for this study, a well-structured open- and close-ended questionnaire adapted from previous studies[16,34] after a few modifications in the demographic characteristics to suit the study setting was used. This was followed by the Edinburgh Postnatal Depression Scale (EPDS), which is a self-rated questionnaire. It is a 10-item scale that assesses how women cope with life changes during pregnancy and birth.[35] This instrument has a total score of 30, with a score of 10 and above indicating possible depression and a score below 10 indicating the possibility of no depression. The EPDS has been validated in Ghana with a cut-off point of 11 and found to have a Cronbach's alpha of 0.79.[36] This instrument was translated from English to Kusaal (the local language) and translated back to English by a professional linguist. Pretesting of

the tool was done by administering the questionnaire to 24 (10%) postpartum women in Garu, a nearby community which is 25 km away from the Bawku municipality, for correction and consistency checks.

In this study, the outcome variable was PPD, which was categorized as "not depressed" and "depressed" using the EPDS. Mothers whose total EPDS scores were less than or equal to 11 were considered not depressed, but those whose EPDS scores were above 11 were considered depressed.[36] Independent variables were (i) the sociodemographic factors such as age, marital status, type of marriage, educational level, employment status, monthly income, any chronic illness, and previous infant death, (ii) the social factors included social and husband support, marital satisfaction, domestic violence, stressful life events, and substance use (use of any substance during the puerperium period for a nonmedical purpose, alcohol, cigarettes, etc.), and (iii) the obstetrics factors included pregnancy type, prenatal visits, parity, prenatal admission, pregnancy and obstetric complication, mode of delivery, blood transfusion, pregnancy intention, and having a currently hospitalized child.

Data were collected from each of the four study sites (health facilities). Trained research assistants, who were nurses were engaged to assist in administering the questionnaire to the participants in the local language, especially to those who could not speak English. All Covid-19 protocols were duly observed.

The data collected were checked, cleaned, coded, and entered into the SPSS version 26 program for analysis. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to describe the sociodemographic and maternity-related variables. Chi-square analysis was performed to show the significant relationship with the explanatory variables and the outcome measure. Variables that were significant at the bivariate level were then used for the multivariate logistic analysis. Multivariate logistic regression analysis was used to determine predictors of PPD among the participants. Results from the multicollinearity test showed that none of the explanatory variables had a variance inflation factor of more than 10, which is necessary for exclusion according to Chatterjee et al.,[37] as shown in Appendix S1. The results of the multivariate logistic regression analysis were presented as adjusted odds ratios (aORs) with their confidence intervals (CIs). Statistical significance was considered for P-value below 0.05.

RESULTS

Sociodemographic and obstetric characteristics

Out of the 255 participants sampled, 242 women consented to the study, giving an overall response rate of 94.9%. Table 1 shows that out of a total of 242 postpartum mothers, 34.7% fell within the age range of 25–29, with a mean age of 27.9 (standard deviation [SD] ± 6.33). Most mothers (86.8%) were married, 40.9% had secondary school education, and 24.4% had no formal education. In

TABLE 1 Sociodemographic, and obstetric characteristics of participants

Variable	Category	Frequency (*n*)	Perecentage (%)
Age	16–24	74	30.6
	25–29	84	34.7
	30–34	48	19.8
	35–39	18	7.4
	40–44	18	7.4
Marital status	Married	210	86.8
	Single	17	7.0
	Divorced	12	5.0
	Widowed	3	1.2
Type of marriage	Polygamy	65	27.8
	Monogamy	169	72.2
Educational level	Primary	46	19.0
	Secondary	99	40.9
	Tertiary	38	15.7
	None	59	24.4
Employment status	Formal	52	21.5
	Informal	190	78.5
Monthly income (GHC)	<300	154	63.6
	300–600	47	19.4
	600–900	9	3.7
	>900	32	13.2
Supportive partner	Yes	208	86.0
	No	34	14.0
Domestic or partner violence	Yes	33	13.6
	No	209	86.4
Pregnancy type	Planned	188	77.7
	Unplanned	54	22.3
Prenatal visit	>4	194	80.2
	<4	48	19.8
Parity	1	88	36.4
	2–3	119	49.2
	>3	35	14.5
Prenatal admission	Yes	93	38.4
	No	149	61.6
Pregnancy/ obstetric complication	Yes	39	16.1
	No	203	83.9
Mode of delivery	SVD	193	79.8
	CS	49	20.2

(Continues)

TABLE 1 (Continued)

Variable	Category	Frequency (*n*)	Perecentage (%)
Blood transfusion	Yes	67	27.7
	No	175	72.3
Place of delivery	Health facility	221	91.3
	Home	21	8.7
Postnatal weeks	<3	79	32.6
	3–5	65	26.9
	6–8	63	26.0
	9–12	35	14.5
Any chronic illness	Yes	24	9.9
	No	218	90.1
Marital satisfaction	Yes	186	82.7
	No	29	17.3
Substance use	Yes	19	7.9
	No	223	92.1
Previous infant death	Yes	20	8.3
	No	222	91.7
Stressful life events	Yes	60	24.8
	No	182	75.2

Abbreviations: CS, caesarian section; GHC, Ghana Cedis; SVD, spontaneous vaginal delivery.

addition, 78.5% of participants were engaged in informal employment, with 63.6% having monthly income <300 Ghana Cedis. Eighty-six percent of participants had supportive partners, with 13.6% experiencing domestic/partner violence.

Table 2 outlines the association between PPD and the explanatory variables. The study found that age, marital status, employment status, monthly income, supportive partner, domestic or partner violence, pregnancy type, prenatal visits, pregnancy/obstetric complication, place of delivery, postnatal weeks, chronic illness, marital satisfaction, substance use, previous infant death, and stressful life events were significantly associated with PPD.

We found that women who were below the age of 24 had a higher proportion of PPD (64.9%). With regards to employment, women who were informally employed had a higher proportion of PPD (54.7%). Women with fewer than four prenatal visits (81.3%), pregnancy/obstetric complication (69.2%), home delivery (76.2%), chronic illness (87.5%), substance use (94.7%), infant death (80.0%), and stressful life events (81.7%) recorded the highest proportion of PPD.

Prevalence of PPD among mothers

The study found that the prevalence of PPD among mothers in the Bawku district was 50.4% (95% confidence interval [CI] 43.9–56.9).

Factors associated with the development of PPD

Table 3 outlines the factors that are associated with the development of PPD among women in the Bawku municipality in Ghana. The study found that mothers with fewer than four prenatal visits were more likely to develop PPD (aOR = 13.44, 95% CI 3.66-49.37, P < 0.001) than those who had more than four prenatal visits. Mothers who had pregnancy/obstetric complications were more likely to develop PPD (aOR = 3.39, 95% CI 1.23–11.19, P = 0.019) than those without complications. Mothers who had <3 weeks (aOR = 8.14, 95% CI 1.95–33.94, P = 0.004) and 6–8 weeks (aOR = 7.72, 95% CI 1.71–34.80, P = 0.008) of postnatal care were more likely to develop PPD than those with 9–12 weeks of postnatal care. Mothers who had any form of chronic illness were more than seven times more likely to develop PPD (aOR = 7.35, 95% CI 1.85–29.22, P = 0.005) than those without any chronic illness. Mothers who experienced stressful life events were three times more likely to develop PPD (aOR = 3.16, 95% CI 1.20–8.28, P = 0.018) than those without stressful life events.

DISCUSSION

This study assessed the prevalence and associated factors of PPD among postnatal women in the Bawku municipality in the Upper East Region of Ghana. The prevalence of PPD among women in this study was 50.4%. The postpartum period is a time of vulnerability to distress for many women and that additional stress due to unstable local security may increase the incidence of PPD. Bawku has been experiencing tribal conflicts with occasional spikes. This is likely to worsen the stressful situation of postnatal mothers in the town. Studies suggest that in places with unstable security, inhabitants have higher predisposition to mental illness.[38] Findings from Lim et al. showed that there was a high prevalence (37.4%) of depression among civilians in a conflict-prone community.[39] The high prevalence in this study could also be attributed to the epidemiological conditions at the time of the study as the study was conducted during the period of the Covid-19 pandemic. Studies have shown that PPD prevalence was found to be high during the Covid-19 period compared to the prevalence of PPD prior to Covid-19.[40] The findings from this current study are in tandem with findings from studies in Pakistan[41] and Kazakhstan[42] where the prevalence of PPD was 56% and 59.4%, respectively. In contrast to our findings, lower prevalence rates were found in the southern (41.1%)[16] and northern (16.8%)[17] part of Ghana. Other lower prevalence rates were observed in some part of Africa, including Eritrea (7.4%),[9] Ethiopia (33.3%),[43] and Sudan (9.2%).[44]

We found that attending fewer than four prenatal or antenatal clinic visits was associated with PPD. This maybe because prenatal clinic attendance assists in allaying the fears of expectant mothers and hence poor attendance may pose a risk of inappropriate anxiety and depression.[45] It is therefore imperative to motivate and encourage pregnant women to have regular antenatal visits. It is possible that women who do not have adequate knowledge of the

TABLE 2 Bivariate analysis of sociodemographic and maternal factors associated with PPD

Variable	Category	PPD		χ^2	P-value
		Yes (%)	No (%)		
Age	0–24	48 (64.9)	26 (35.1)	11.386[a]	0.023
	25–29	35 (41.7)	49 (58.3)		
	30–34	21 (43.8)	27 (56.3)		
	35–39	11 (61.1)	7 (38.9)		
	40–44	7 (38.9)	11 (61.1)		
Marital status	Married	99 (47.1)	111 (52.9)	10.807[a]	0.013
	Single	11 (64.7)	6 (35.3)		
	Divorced	11 (91.7)	1 (8.3)		
	Widowed	1 (33.3)	2 (66.7)		
Type of marriage	Polygamy	36 (55.4)	29 (44.6)	1.216a	0.270
	Monogamy	80 (47.3)	89 (52.7)		
Educational level	Primary	23 (50.0)	23 (50.0)	6.063[a]	0.109
	Secondary	57 (57.6)	42 (42.4)		
	Tertiary	13 (34.2)	25 (65.8)		
	None	29 (49.2)	30 (50.8)		
Employment status	Formal	18 (34.6)	34 (65.4)	6.612[a]	0.010
	Informal	104 (54.7)	86 (45.3)		
Monthly income (GHC)	<300	87 (56.5)	67 (43.5)	10.884[a]	0.012
	300–600	22 (46.8)	25 (53.2)		
	600–900	5 (55.6)	4 (44.4)		
	>900	8 (25.0)	24 (75.0)		
Supportive partner	Yes	99 (47.6)	109 (52.4)	4.700[a]	0.030
	No	23 (67.6)	11 (32.4)		
Domestic or partner violence	Yes	26 (78.8)	7 (21.2)	12.306[a]	<0.001
	No	96 (45.9)	113 (54.1)		
Pregnancy type	Planned	80 (42.6)	108 (57.4)	20.822[a]	<0.001
	Unplanned	42 (77.8)	12 (22.2)		
Prenatal visit	>4	83 (42.8)	111 (57.2)	22.776[a]	<0.001
	<4	39 (81.3)	9 (18.8)		
Parity	1	44 (50.0)	44 (50.0)	.088[a]	0.957
	2–3	61 (51.3)	58 (48.7)		
	>3	17 (48.6)	18 (51.4)		
Prenatal admission	Yes	50 (53.8)	43 (46.2)	.678[a]	0.410
	No	72 (48.3)	77 (51.7)		
Pregnancy/obstetric complication	Yes	27 (69.2)	12 (30.8)	6.586[a]	0.010
	No	95 (46.8)	108 (53.2)		
Mode of delivery	Spontaneous vaginal delivery	93 (48.2)	100 (51.8)	1.891[a]	0.169
	Caesarian section	29 (59.2)	20 (40.8)		

(Continues)

TABLE 2 (Continued)

Variable	Category	PPD		χ^2	P-value
		Yes (%)	No (%)		
Blood transfusion	Yes	34 (50.7)	33 (49.3)	.004[a]	0.949
	No	88 (50.3)	87 (49.7)		
Place of delivery	Health facility	106 (48.0)	115 (52.0)	6.112[a]	0.013
	Home	16 (76.2)	5 (23.8)		
Postnatal weeks	<3	44 (55.7)	35 (44.3)	18.336[a]	<0.001
	3–5	31 (47.7)	34 (52.3)		
	6–8	40 (63.5)	23 (36.5)		
	9–12	7 (20.0)	28 (80.0)		
Any chronic illness	Yes	21 (87.5)	3 (12.5)	14.659[a]	<0.001
	No	101 (46.3)	117 (53.7)		
Marital satisfaction	Yes	85 (45.7)	101 (54.3)	5.671[a]	0.017
	No	26 (66.7)	13 (33.3)		
Substance use	Yes	18 (94.7)	1 (5.3)	16.204[a]	<0.001
	No	104 (46.6)	119 (53.4)		
Previous infant death	Yes	16 (80.0)	4 (20.0)	7.634[a]	0.006
	No	106 (47.7)	116 (52.3)		
Stressful life events	Yes	49 (81.7)	11 (18.3)	31.173[a]	<0.001
	No	73 (40.1)	109 (59.9)		

Abbreviation: GHC, Ghana Cedis.

importance of antennal care might not adhere to the recommended visits.[46] Other significant factors such as health system factors (long waiting times, inadequate staff, and limited access) and individual level factors (low socioeconomic status, rural areas, etc.) influence underutilization of antenatal care.[47] Our findings signify that interventions and policies that aim to eliminate the barriers to antenatal care are required to improve utilization, which will subsequently have a positive effect on PPD. Similar findings were reported from studies in Ethiopia,[48,49] Jordan,[50] and Tanzania.[51]

The study also found that mothers with a history of obstetric or pregnancy-related complications were three times more likely to suffer from PPD compared to those without complications. The probable cause of this can be attributed to the fear of the effect of these complications on the pregnancy outcome. Each year in Africa, it is estimated that 30 million women become pregnant, and approximately 250,000 die as a result of pregnancy-related causes.[52] It is also established that women who experience birth complications are likely to experience physical and psychological morbidity after birth according to a systematic review by Noelle Border.[53] This finding is consistent with several other studies conducted in Tanzania,[22] Uganda,[14] Greece,[54] and the Netherlands[55] in which pregnancy/birth complication (eclampsia) was reported to be significantly associated with PPD.

Additionally, mothers who had delivered <3 weeks and those who were between 6 and 8 weeks postpartum had a significant risk of developing PPD. This maybe because of the stress associated with delivery, the change in lifestyle, and the associated stress that having to take care of a newborn baby brings.[56] This finding is consistent with a study conducted in Australia which reported that the early weeks postpartum were the most challenging moments for new mothers.[57]

Stressful life events are events and situations that cause emotional or physical discomfort, fatigue, anxiety, concern, frustration, ambivalence, or fear.[58] Evidence shows that both acute and long-term stressors are associated with PPD, with acute stressors occurring prior to pregnancy and birth having a long-lasting effect on the woman's life.[59] This study found that mothers who experienced stressful life events were more likely to develop PPD. Pregnancy itself is a very stressful event in the lives of women, coupled with other life events such as the unstable security situation in the town. This finding is consistent with studies in Australia,[60] and Armenia.[61] The current study findings underscore the need to explore stressors occurring throughout women's lives in relation to PPD.

LIMITATIONS AND STRENGTHS OF THIS STUDY

The study findings should be considered with some caveats. First, the study used subjective measures in assessing marital satisfaction instead of an objective scale and this may have affected the response

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TABLE 3 Multiple logistic regression analysis of factors associated with PPD

Variable	Category	cOR [95% CI]	P-value	aOR (95% CI)	P-value
Age	0–24	2.90 [1.00, 8.38]	0.049	3.72 [0.72, 19.16]	0.116
	25–29	1.12 [0.39, 3.18]	0.828	1.35 [0.26, 6.98]	0.715
	30–34	1.22 [0.40, 3.69]	0.722	2.30 [0.42, 12.62]	0.337
	35–39	2.46 [0.64, 9.43]	0.186	2.28 [0.32, 15.99]	0.407
	40–44	Ref		Ref	
Marital status	Married	Ref		Ref	
	Single	2.05 [0.73, 5.76]	0.171	0.35 [0.13, 9.65]	o.539
	Divorced	12.33 [1.56, 97.24]	0.017	10.14 [4.67, 88.63]	0.089
	Widowed	0.56 [0.05, 6.27]	0.639	1.14 [0.38, 3.39]	0.805
Employment status	Formal	Ref		Ref	
	Informal	2.28 [1.20, 4.327]	0.011	1.147 [0.38, 3.39]	0.805
Monthly income (GHC)	<300	3.89 [1.64, 9.21]	0.002	2.90 [0.66, 12.75]	0.157
	300–600	2.64 [0.98, 7.06]	0.053	2.22 [0.44, 11.10]	0.330
	600–900	3.75 [0.80, 17.47]	0.092	5.62 [0.56, 56.02]	0.141
	>900	Ref		Ref	
Supportive partner	Yes	Ref		Ref	
	No	2.30 [1.06, 4.96]	0.033	0.54 [0.12, 2.38]	0.417
Domestic or partner violence	Yes	4.37 [1.81, 10.51]	0.001	3.10 [0.78, 12.21]	0.106
	No	Ref		Ref	
Pregnancy type	Planned	Ref		Ref	
	Unplanned	4.72 [2.33, 9.55]	<0.001	3.93 [0.98, 15.68]	0.053
Prenatal visit	>4	Ref		Ref	
	<4	5.79 [2.66, 12.62]	<0.001	13.44 [3.66, 49.37]	<0.001
Pregnancy/obstetric complication	Yes	2.55 [1.22, 5.32]	0.012	3.39 [1.23, 11.19]	0.019
	No	Ref		Ref	
Place of delivery	Health facility	Ref		Ref	
	Home	3.37 [1.22, 9.80]	0.019	0.45 [0.07, 2.92]	0.410
Postnatal weeks	<3	5.02 [1.96, 12.86]	0.001	8.14 [1.95, 33.94]	0.004
	3–5	3.64 [1.39, 9.53]	0.008	4.20 [0.99, 17.76]	0.051
	6–8	6.95 [2.62,18.42]	<0.001	7.72 [1.71, 34.80]	0.008
	9–12	Ref		Ref	
Any chronic illness	Yes	8.10 [2.35, 27.98]	0.001	7.35 [1.85, 29.22]	0.005
	No	Ref		Ref	
Marital satisfaction	Yes	Ref		Ref	
	No	2.37 [1.15, 4.9]	0.019	2.61 [0.76, 8.94]	0.127
Substance use	Yes	20.59 [2.70, 16.94]	0.08	18.23 [1.80, 16.40]	0.581
	No	Ref			
Previous infant death	Yes	4.37 [1.41, 13.50]	0.010	2.00 [0.42, 9.49]	0.382
	No	Ref		Ref	
Stressful life events	Yes	6.65 [3.24, 13.63]	<0.001	3.30 [1.23, 8.89]	0.018
	No	Ref		Ref	

Abbreviations: aOR, adjusted odds ratio; GHC, ghana cedis; cOR, unadjusted odds ratio; CI, confidence interval; Ref, reference category.

(social desirability bias). Second, the tool used in this study is not exhaustive hence other factors that are pertinent to the study area may not have been covered. This study used a cross-sectional design and thus could only assess correlation but not causation. Also, this was a facility-based study so the findings may not be generalizable to the whole community. Future study should focus on a larger sample size in a nationwide study to obtain country-specific prevalence of PPD and its associated factors.

Despite these limitations, this study reports a high prevalence of PPD among women in the Bawku municipality, which indicates an urgent need that all women attending postnatal clinics, and by extension antenatal clinics, should be screened for PPD for early identification of at-risk patients and onward referral to the psychiatric unit for proper assessment and possible treatment. These findings add to the clarion call for early identification of such patients to facilitate early treatment.

IMPLICATION FOR PRACTICE

The high prevalence of PPD among women in the Bawku municipality indicates an urgent need for all women attending postnatal clinics and by extension antenatal clinic to be screened for PPD for early identification of at-risk patients and onward referral to the psychiatric unit for proper assessment and possible treatment. Early identification of such patients will enhance early treatment, yielding better outcomes and avoiding the possible complications of PPD. The findings in this study show that antenatal clinic attendance of four times or more plays a strong role in the prevention of PPD. It is important to ensure that barriers such as proximity to the clinic, staff attitudes, and cost of transportation, to mention just a few, are addressed to make antenatal services more accessible to these mothers.

Our findings could also provide important guidance for policymakers and healthcare professionals to tackle mental health issues among postpartum mothers. These findings direct the need to increase public awareness about PPD and its associated risk factors such as stressful life events, poor antenatal attendance and history of obstetric complication.

CONCLUSION

This study revealed a high prevalence of PPD and identified key predictors among postpartum women in the Bawku municipality. It makes an important contribution to the fight against maternal mental illness and its associated factors. We suggest that further studies should use a longitudinal design to track a group of mothers to determine causal relationships between PPD and the identified risk factors in this study. A qualitative study to explore and understand the lived experiences, challenges, and coping strategies is also imperative.

AUTHOR CONTRIBUTIONS

Dennis Bomansang Daliri: Conceptualization; data curation; data collection; methodology and analysis. Agani Afaya: Data curation; data collection; methodology and analysis. Richard A. Afaya: Data curation. Nancy Abagye: Data collection. Dennis Bomansang Daliri, Agani Afaya, Richard A. Afaya, Nancy Abagye: Writing of manuscript – review and editing.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data and data collection instrument used for the study are attached as supplementary files.

ETHICAL STATEMENT

Ethical approval for this study was obtained from the Ethics Committee of KNUST with approval number CHRPE/AP/469/21 before the commencement of the study. Participation in this study was on a voluntary basis and written informed consent was sought from participants before being recruited. They were also informed that by signing the informed consent, they had also consented to the data being used in a manuscript for publication. Participants were further informed of their right to exit the study at any point in time if they so wished. Data gathered were stored in a password-protected database, accessible only to the research team.

PATIENT CONSENT STATEMENT

N/A

CLINICAL TRIAL REGISTRATION

N/A

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REFERENCES

1. Peng S, Lai X, Du Y, Meng L, Gan Y, Zhang X. Prevalence and risk factors of postpartum depression in China: a hospital-based cross-sectional study. J Affect Disord. 2021;282:1096–100.
2. Gebregziabher NK, Netsereab TB, Fessaha YG, Alaza FA, Ghebrehiwet NK, Sium AH. Prevalence and associated factors of

postpartum depression among postpartum mothers in central region, Eritrea: a health facility based survey. BMC Public Health. 2020;20(1):1614.
3. Perfetti J, Clark R, Fillmore CM. Postpartum depression: identification, screening, and treatment. WMJ. 2004;103(6):56–63.
4. Parsons CE, Young KS, Rochat TJ, Kringelbach ML, Stein A. Postnatal depression and its effects on child development: a review of evidence from low- and middle-income countries. Br Med Bull. 2012;101:57–79.
5. Jin Q, Mori E, Sakajo A. Risk factors, cross-cultural stressors and postpartum depression among immigrant Chinese women in Japan. Int J Nurs Pract. 2016;22(S1):38–47.
6. Kumar G, Jain A, Hegde S. Prevalence of depression and its associated factors using Beck Depression Inventory among students of a medical college in Karnataka. Indian J Psychiatry. 2012;54(3):223–6.
7. Halbreich U, Alarcon RD, Calil H, Douki S, Gaszner P, Jadresic E, et al. Culturally-sensitive complaints of depressions and anxieties in women. J Affect Disord. 2007;102(1–3):159–76.
8. Stewart DE, Vigod S. Postpartum depression. N Engl J Med. 2016;375:2177–86.
9. Gebregziabher GT, Hadgu FB, Abebe HT. Prevalence and associated factors of perinatal asphyxia in neonates admitted to Ayder Comprehensive Specialized Hospital, Northern Ethiopia: a cross-sectional study. Int J Pediatr. 2020;2020:1–8.
10. Myers S, Johns SE. Postnatal depression is associated with detrimental life-long and multi-generational impacts on relationship quality. PeerJ. 2018;6:e4305.
11. El-Hachem C, Rohayem J, Bou Khalil R, Richa S, Kesrouani A, Gemayel R, et al. Early identification of women at risk of postpartum depression using the Edinburgh Postnatal Depression Scale (EPDS) in a sample of Lebanese women. BMC Psychiatry. 2014;14(1):242.
12. Wubetu AD, Engidaw NA, Gizachew KD. Prevalence of postpartum depression and associated factors among postnatal care attendees in Debre Berhan, Ethiopia, 2018. BMC Pregnancy Childbirth. 2020;20(1):189.
13. Shitu S, Geda B, Dheresa M. Postpartum depression and associated factors among mothers who gave birth in the last twelve months in Ankesha district, Awi zone, North West Ethiopia. BMC Pregnancy Childbirth. 2019;19(1):435.
14. Atuhaire C, Brennaman L, Cumber SN, Rukundo GZ, Nambozi G. The magnitude of postpartum depression among mothers in Africa: a literature review. Pan Afr Med J. 2020;37:89.
15. Anokye R, Acheampong E, Budu-Ainooson A, Obeng EI, Akwasi AG. Prevalence of postpartum depression and interventions utilized for its management. Ann Gen Psychiatry. 2018;17:18.
16. Sefogah PE, Samba A, Mumuni K, Kudzi W. Prevalence and key predictors of perinatal depression among postpartum women in Ghana. Int J Gynecol Obstet. 2020;149(2):203–10.
17. Saeed N, Wemakor A. Prevalence and determinants of depression in mothers of children under 5 years in Bole District, Ghana. BMC Res Notes. 2019;12(1):373.
18. Weobong B, Ten Asbroek AH, Soremekun S, Danso S, Owusu-Agyei S, Prince M, et al. Determinants of postnatal depression in rural ghana: findings from the don population based cohort study. Depress Anxiety. 2015;32(2):108–19.
19. Yim IS, Tanner Stapleton LR, Guardino CM, Hahn-Holbrook J, Dunkel Schetter C. Biological and psychosocial predictors of postpartum depression: systematic review and call for integration. Annu Rev Clin Psychol. 2015;11:99–137.
20. Liang P, Wang Y, Shi S, Liu Y, Xiong R. Prevalence and factors associated with postpartum depression during the COVID-19 pandemic among women in Guangzhou, China: a cross-sectional study. BMC Psychiatry. 2020;20(1):557.
21. Azale T, Fekadu A, Hanlon C. Postpartum depressive symptoms in the context of high social adversity and reproductive health threats: a population-based study. Int J Ment Health Syst. 2018;12(1):42.
22. Mbarak B, Kilewo C, Kuganda S, Sunguya BF. Postpartum depression among women with pre-eclampsia and eclampsia in Tanzania; a call for integrative intervention. BMC Pregnancy Childbirth. 2019;19(1):270.
23. Benuyenah V, Tran PB. Postpartum psychological pressure on single mothers: an interpretative phenomenological analysis. J Humanit Appl Soc Sci. 2021;3(3):199–216.
24. Goyal D, Gay C, Lee KA. How much does low socioeconomic status increase the risk of prenatal and postpartum depressive symptoms in first-time mothers? Women's Health Issues. 2010;20(2):96–104.
25. Yator O, Mathai M, Albert T, Kumar M. Burden of HIV-related stigma and post-partum depression: a cross-sectional study of patients attending prevention of mother-to-child transmission clinic at Kenyatta National Hospital in Nairobi. Front Psychiatry. 2021;11:532557. https://doi.org10.3389/fpsyt.2020.532557
26. Osok J, Kigamwa P, Stoep AV, Huang K-Y, Kumar M. Depression and its psychosocial risk factors in pregnant Kenyan adolescents: a cross-sectional study in a community health Centre of Nairobi. BMC Psychiatry. 2018;18(1):136.
27. Mochache K, Mathai M, Gachuno O, Vander Stoep A, Kumar M. Depression during pregnancy and preterm delivery: a prospective cohort study among women attending antenatal clinic at Pumwani Maternity Hospital. Ann Gen Psychiatry. 2018;17(1):31.
28. Kuruvilla S, Bustreo F, Kuo T, Mishra C, Taylor K, Fogstad H, et al. The Global strategy for women's, children's and adolescents' health (2016-2030): a roadmap based on evidence and country experience. Bull World Health Organ. 2016;94(5):398–400.
29. Patel V. The future of psychiatry in low-and middle-income countries. Psychol Med. 2009;39(11):1759–62.
30. Ongeri L, Wanga V, Otieno P, Mbui J, Juma E, Stoep AV, et al. Demographic, psychosocial and clinical factors associated with postpartum depression in Kenyan women. BMC Psychiatry. 2018;18(1):318.
31. Gold K, Spangenberg K, Wobil P, Schwenk T. Depression and risk factors for depression among in Kumasi, Ghana. Int J Gynaecol Obstet. 2012;120(3):228–31.
32. Wang X, Cheng Z. Cross-sectional studies. Chest. 2020;158(1, Suppl):S65–71.
33. Kang H. Sample size determination and power analysis using the G*Power software. J Educ Eval Health Prof. 2021;18:17.
34. Abadiga M. Depression and its associated factors among HIV/AIDS patients attending ART clinics at Gimbi General hospital, West Ethiopia, 2018. BMC Res Notes. 2019;12(1):527.
35. Cox J. Validation of the Edinburgh Postnatal Depression Scale (EPDS) in non-postnatal women. J Affect Disord. 1996;39(3):185–9.
36. Weobong B, Akpalu B, Doku V, Owusu-Agyei S, Hurt L, Kirkwood B, et al. The comparative validity of screening scales for postnatal common mental disorder in Kintampo, Ghana. J Affect Disord. 2009;113(1):109–17.
37. Chatterjee S, Hadi A, Price B. Regression analysis by example. New York: John Wiley & Sons. Inc.; 2000.
38. Bryant RA, Schnurr PP, Pedlar D. Addressing the mental health needs of civilian combatants in Ukraine. Lancet Psychiatry. 2022;9(5):346–7.
39. Lim ICZY, Tam WWS, Chudzicka-Czupała A, McIntyre RS, Teopiz KM, Ho RC, et al. Prevalence of depression, anxiety and post-traumatic stress in war- and conflict-afflicted areas: a meta-analysis. Front Psychiatry. 2022;13:978703.
40. Chen Q, Li W, Xiong J, Zheng X. Prevalence and risk factors associated with postpartum depression during the COVID-19 pandemic: a literature review and meta-analysis. Int J Environ Res Public Health. 2022;19(4):2219.

41. Husain N, Bevc I, Husain M, Chaudhry IB, Atif N, Rahman A. Prevalence and social correlates of postnatal depression in a low income country. Arch Womens Ment Health. 2006;9(4):197–202.
42. Abenova M, Myssayev A, Kanya L, Turliuc MN, Jamedinova U. Prevalence of postpartum depression and its associated factors within a year after birth in Semey, Kazakhstan: a cross sectional study. Clin Epidemiol Glob Health. 2022;16:101103.
43. Kerie S, Menberu M, Niguse W. Prevalence and associated factors of postpartum depression in Southwest, Ethiopia, 2017: a cross-sectional study. BMC Res Notes. 2018;11(1):623.
44. Khalifa D, Glavin K, Bjertness E, Lien L. Postnatal depression among Sudanese women: prevalence and validation of the Edinburgh Postnatal Depression Scale at 3 months postpartum. Int J Women's Health. 2015;7:677–84.
45. Roumieh M, Bashour H, Kharouf M, Chaikha S. Prevalence and risk factors for postpartum depression among women seen at Primary Health Care Centres in Damascus. BMC Pregnancy Childbirth. 2019;19(1):519.
46. Afaya A, Azongo TB, Dzomeku VM, Afaya RA, Salia SM, Adatara P, et al. Women's knowledge and its associated factors regarding optimum utilisation of antenatal care in rural Ghana: a cross-sectional study. PLoS One. 2020;15(7):e0234575.
47. Anaba EA, Afaya A. Correlates of late initiation and underutilisation of the recommended eight or more antenatal care visits among women of reproductive age: insights from the 2019 Ghana Malaria Indicator Survey. BMJ Open. 2022;12(7):e058693.
48. Asaye MM, Muche HA, Zelalem ED. Prevalence and predictors of postpartum depression: Northwest Ethiopia. Psychiatry J. 2020; 2020:1–9.
49. Ayele DG, Zewotir TT. Comparison of under-five mortality for 2000, 2005 and 2011 surveys in Ethiopia. BMC Public Health. 2016;16: 930.
50. Mohammad KI, Gamble J, Creedy DK. Prevalence and factors associated with the development of antenatal and postnatal depression among Jordanian women. Midwifery. 2011;27(6):e238–45.
51. Kaaya SF, Mbwambo JK, Kilonzo GP, Van Den Borne H, Leshabari MT, Fawzi MC, et al. Socio-economic and partner relationship factors associated with antenatal depressive morbidity among pregnant women in Dar es Salaam, Tanzania. Tanzan J Health Res. 2010;12(1):23–35.
52. Bongaarts J. WHO, UNICEF, UNFPA, World Bank Group, and United Nations Population Division Trends in Maternal Mortality: 1990 to 2015. Geneva: World Health Organization; 2015.
53. Borders N. After the afterbirth: a critical review of postpartum health relative to method of delivery. J Midwifery Womens Health. 2006;51(4):242–8.
54. Koutra K, Chatzi L, Bagkeris M, Vassilaki M, Bitsios P, Kogevinas M. Antenatal and postnatal maternal mental health as determinants of infant neurodevelopment at 18 months of age in a mother–child cohort (Rhea Study) in Crete, Greece. Soc Psychiatry Psychiatr Epidemiol. 2013;48(8):1335–45.
55. Blom EA, Jansen PW, Verhulst FC, Hofman A, Raat H, Jaddoe VW, et al. Perinatal complications increase the risk of postpartum depression. BJOG. 2010;117(11):1390–8.
56. O'Hara MW, Wisner KL. Perinatal mental illness: definition, description and aetiology. Best Pract Res Clin Obstet Gynaecol. 2014;28(1):3–12.
57. Xiao X, Ngai F, Zhu S, Loke AY. The experiences of early postpartum Shenzhen mothers and their need for home visit services: a qualitative exploratory study. BMC Pregnancy Childbirth. 2019; 20(1):5.
58. Alvarenga P, Frizzo GB. Stressful life events and women's mental health during pregnancy and postpartum period. Paidéia (Ribeirão Preto). 2017;27:51–9.
59. Reid K, Taylor M. Stress and maternal postpartum depression: the importance of stress type and timing. Popul Res Policy Rev. 2015;34:851–75.
60. Chojenta C, Loxton D, Lucke J. How do previous mental health, social support, and stressful life events contribute to postnatal depression in a representative sample of Australian women? J Midwifery Womens Health. 2012;57(2):145–50.
61. Demirchyan A, Petrosyan D, Armenian H. Rate and predictors of postpartum depression in a 22-year follow-up of a cohort of earthquake survivors in Armenia. Arch Womens Ment Health. 2014;17:229–37.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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