European Journal of Medical and Health Sciences
Vol 7 | Issue 1 | February 2025
ISSN 2593-8339

RESEARCH ARTICLE

Prevalence and Risk Factors for Postpartum Depression in eThekwini District of KwaZulu-Natal Province of South Africa

Akm Monjurul Hoque[1,*], Maariyah Hoque[2], Rafiul Hoque[3], and Somaya Buckus[1]

ABSTRACT

Despite being a global public health issue, postpartum depression (PPD) is comparatively more common in underdeveloped nations, notably those in Sub-Saharan Africa. In South Africa (SA), primary healthcare facilities do not regularly screen for PPD, despite reports that it compromises the health of mothers and children. Finding the prevalence of PPD and its contributing factors in a sample of clinic attendees in a subdistrict of eThekwini, SA was the aim of this study. A sample of 399 women in a health facility participated in a cross-sectional, quantitative study. Information on socio-demographics and obstetric history was gathered using a self-administered questionnaire. Data on depression symptoms were gathered using the Edinburgh Postnatal Depression Scale (EPDS). Women who gave birth to infants after ten days were asked to complete the (EPDS) questionnaire. A score of 13 out of a possible 30 was the cut-off point for the EPDS. Most of the women (60.9%) had scores of 13 or higher, indicating symptoms of PPD. Mode of delivery was significantly linked to PPD on logistic regression (OR = 2.287, p-value 0.007, 95% CI of 1.25 to 4.16), with Caesarean section deliveries being associated with a higher risk of depressed symptoms than normal vaginal delivery. Full-time working women were shown to be protective, as evidenced by their low OR of 0.45 (p = 0.02 and 95% CI of 0.23 to 0.88). The findings support the necessity of routine screening for PPD symptoms in a Primary Health Care facility in SA as they demonstrated the larger percentage of women who suffer from PPD yet go undiagnosed and untreated.

Keywords: eThekwini, maternal health, postpartum depression, South Africa.

Submitted: December 18, 2024

Published: February 17, 2025

10.24018/ejmed.2025.7.1.2248

[1] *Kwadabeka Community Health Centre, South Africa.*
[2] *South African College of Applied Psychology, South Africa.*
[3] *Green University of Bangladesh, Bangladesh.*

* ***Corresponding Author:***
e-mail: mhoque75@gmail.com

1. Introduction

One of the most well-known mental health conditions that some women experience after childbirth is postpartum depression (PPD), which has a detrimental effect on their capacity to do everyday tasks and care for the infant. The significant prevalence of PPD as a public health issue has been extensively documented in high-, middle-, and low-income nations [1], [2]. PPD is still underdiagnosed and undertreated in many low- and middle-income nations [3]. With a global incidence of up to 60% and a broad range of 3.5%–63.3%, PPD rates differ between nations and regions [4]. Depressed women are more likely to engage in harmful behaviours, eat poorly, and ignore postnatal care, all of which can have a negative impact on the mother and newborn child. These negative consequences include behavioural issues, cognitive decline, poor maternal mental health, and long-term psychological difficulties for the newborns. Untreated PPD can result in severe depression, marital and family connection problems, and long-term health and psychological problems for the mother's kid [5]. The prognosis can be improved, and negative effects can be reduced with early PPD screening, support, and treatment. Consequently, PPD in mothers is a serious public health issue.

The frequency of PPD varies greatly from nation to nation. According to a prior review research, the average prevalence of PPD is 15.4% in the USA, 38.1% in Italy, 17.1% in Germany, and 22.5% in Ireland [6]. With a prevalence of 45.1% in 2011 [7], 49.3% in 2014 [8], and 50.3% in 2015 [9], as well as a prevalence of 57.14% in 2020 [1], prior research carried out in South Africa (SA) indicates a progressive rise in PPD over time. The prevalence of

PPD is reported to be 10.4% for serious PPD and 14.6% for low to medium PPD in a South African study that compared postpartum HIV-1-infected women with pre-pregnancy HIV care experience [10]. These findings are comparable to those from high-income nations like the US and Germany, but they are lower than earlier findings from SA studies. Variations in screening methods, symptom onset times, and epidemiological study definitions could all contribute to variations in PPD prevalence rates. Because PPD symptoms are stigmatized or underestimated by mothers and healthcare professionals as normal side effects after childbirth, only 20% of women report experiencing them, according to a previous study in SA [11]. The same study is found only 20% of moms with depression seek therapy, and 50% of mothers with depression do not receive a diagnosis on average [11].

PPD symptoms, such as poor mood, sleep disturbance, appetite changes, lack of focus, and irritability, are comparable to those of depression that can happen at any other stage of life. But, according to a study [12] it is found that women with PPD may also feel guilty about their incapacity to care for their newborns. Numerous studies have identified risk factors for PPD, and these are typically social and personal circumstances like marital status, the financial and emotional support of a partner, an unplanned pregnancy, and the mother's level of education and employment [5], [10]. According to a study, moms who had experienced depression or other mental health issues in the past, as well as those who were less educated and from lower socioeconomic backgrounds, are more likely to develop PPD [13]. Literature has consistently shown that a higher likelihood of developing symptoms of PPD is linked to lack of support from partners or family members [14]. Furthermore, one of the biggest studies in sub-Saharan Africa that evaluated the relationship between HIV and PPD concluded that there is no correlation between HIV status and PPD. This finding may point to the growing acceptance of HIV disease among South Africans in both rural and urban areas [10].

PPD is treated with medication, cognitive therapy, and psychosocial support, which can be obtained through support groups or individual counselling [14]. Mothers with severe PPD must be admitted to the hospital because they may be at risk of suicide. The SA National Department of Health and the United Nations Millennium Development Goals both state that mother and child health should be a top priority in the country [15], [16]. In order to improve outcomes for both mothers and newborns, PPD treatment is essential. Yet no PPD assessment has been conducted by a PHC facility operating a midwife-run obstetric unit (MOU) in eThekwini district of KwaZulu-Natal Province (KZN). KZN has the highest total HIV prevalence at 37.2% [17]. Therefore, research on postpartum depression and related risk factors is particularly important. Our goal is to ascertain the prevalence of PPD at a Community Health Centre in eThekwini, as well as related sociodemographic and obstetric risk variables.

2. Materials and Methods

2.1. Study Design

Women who came for their postpartum visit participated in a cross-sectional, quantitative study that was done at the facility.

2.2. Setting and Population

The study was carried out at Kwadabeka Community Health Centre (KCHC), a primary health care (PHC) institution that offers all pregnant women maternity care through a midwife-run Obstetric Unit (MOU) as part of its entire PHC service package. The community of Kwadabeka is in the peri-urban sub-districts on the northern and west borders of the eThekwini Metropolitan city, and its catchment population of approximately 150,000. Under the direction of KCHC, there are seven more permanent PHC clinics in the region that provide PHC service packages that also include prenatal and postnatal care without delivery services. Most of the population is impoverished, homogeneous, uniform, unemployed, and primarily Black Africans. They live in both formal and informal housing, have cultural ties to the rural Eastern Cape and KZN provinces, and rely on public health facilities. Prenatal, birth, and postnatal headcounts total more than 5,000 per year, according to the clinic's unpublished data. An estimated 700 deliveries and 1500 pregnant women visit the antenatal clinic annually. All postpartum and antennal women who receive normal day care (07:30 to 16:00) can also access emergency assistance and delivery services around-the-clock from the skilled and experienced midwives and other support professionals.

The PHC service package at KCHC, PHC clinics in South Africa, includes ANC, delivery services, PNC, and complete reproductive healthcare for women and adolescents [18]. Low-risk pregnant women give birth at KCHC MOU after receiving prenatal care (ANC) in authorized clinics. For ANC and delivery services, intermediate- and high-risk pregnant women are sent to hospitals by KCHC, including PHC institutions. After giving birth at the hospital, women with low-risk cases are sent back to KCHC for PNC. Midwives and MOs are available to PNC women at KCHC.

2.3. Sampling

All women who visited KCHC for their routine PNC after ten days of giving birth between July and December 2021 made up the study sample. All postpartum qualifying women who consented to participate throughout the study period were included in the sample. All women who gave birth via caesarean section (CS) or vaginal delivery (NVD), with or without the use of equipment, and who gave written consent for the study were eligible to take part. Excluded from the trial were postpartum mothers who refused to take part, went for PNC after ten days of giving birth.

2.4. Data Collection

The Edinburgh Postnatal Depression Scale (EPDS), a screening tool was used to evaluate depressive symptoms during the postpartum period, was used to collect

symptoms of depression. Two midwives working at the postnatal clinic who had received training on the study's goals, methodology, data collection, and gaining study consent gave mothers in the waiting area an explanation of the study's goals, methodology, and informed consent prior to consultation. Qualified women were given the self-administered study questionnaire and the informed consent form to complete. All eligible women were asked to voluntarily participate in the study and fill out the questionnaire without it influencing their care during consultation. Both English and IsiZulu, the local language, were used in the development of the closed-ended questionnaire. While they awaited the midwife's consultation, they were asked to willingly participate without compromising their care. The midwives, who had received training on the study's goals and questionnaire, answered any queries and provided clarification.

2.5. *Screening Tool*

EPDS, a self-administered 10-item measure of depression symptoms, was used to categorize PPD in participants. The most widely used scale for PPD is likely the validated Scale. It is found suitable for South African context because it has also been utilized in another South African research in the past and recently [1], [19], [20]. A 4-point (0–3) scale was used to score the response of each question, and the total score range was 0–30. One benefit of the EPDS is that it does not include physical symptoms that are typically linked to depression. Cognitive and affective symptoms were the main emphasis of the EPDS. The scale evaluated the participant's symptoms during the previous seven days. Depression was defined as a cut-off score of ≥13. The EPDS was implemented both in English and Isi-Zulu as majority of participants first language was Isi-Zulu. The EPDS has a satisfactory sensitivity (79%) and specificity [21] and has been validated for use in pregnant and postpartum women. In South Africa, it has been verified for postpartum SA women at Johannesburg's Coronation Hospital and translated into six distinct South African languages [22]. Additionally, a score of 13 identified 100% of cases of major depression and 70% of cases of minor depression (with sensitivity and specificity of 80% and 76.6%, respectively) when the EPDS was validated against the Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria for depression.

In addition, the tool or questionnaire included the socio-demographic and obstetric history of the participants. The socio-demographic variables were participant's ages, marital, education and employment status. The obstetric variables were mothers' parity, previous birth history, was the pregnancy planned, mode of delivery, postpartum breast feeding and contraceptive practices, HIV status (determined at or before delivery) and the place of delivery.

2.6. *Ethical Considerations*

Participants were requested to voluntarily engage in the study. Informed consent was obtained after the subject's rights were clarified and the objectives and methodology of the study were explained before any data was collected. Participants in the study will not be identified. This research proposal was authorized by the Umgungundlovu Health Ethics Research Board (Reference no. 012/2021) and KZN Health Research & Knowledge Management (Reference no. KZ_202110_023).

3. Data Analysis

A research assistant double-entered the raw data from the participants into a Microsoft Excel application, cleaned it and imported it into SPSS 24.0.1 (SPSS Inc., Chicago, IL, USA), and coded it for analysis. Descriptive statistics were used to describe both continuous and categorical data. While proportions were calculated for categorical variables, the mean and standard deviation (SD) values were calculated for continuous data. Ages were categorized as <20 (or teenage), 20–29, 30–39, and >40 years; postpartum women's parity was categorized as 1–2, 3–4, and >5; mothers' HIV status (determined at or before delivery) was marked as positive or negative, and they were either on ART. Along with the number of years of education attained, employment status was categorized as either full-time, part-time, unemployed, or still enrolled in school. Two kinds of relationship status were established: married and single. A cut-off score of 13 was applied to the EPDS, which consisted of 10 questions with minimum and maximum scores of 0 and 30. A score of 13 or higher showed depressive symptoms, while a score below 13 was classified as not having any making it as binary values. Using a p-value of ≤ 0.05, logistic regression was utilized to investigate the association between obstetric and socio-demographic factors and the EPDS scores as an outcome variable. Women with EPDS scores were classified as either having or not having PPD based on binary values (EPDS score $\geq 13 = 1$ and EPDS score $\leq 12 = 0$). Obstetric and sociodemographic data were considered independent variables or exposure factors. Pearson's chi-square (X^2) and p values for the outcome variable were used in cross-table analysis to identify significant exposure variables. Binary (back-ward) logistic regression analysis was used on the pertinent exposure variables ($p < 0.05$) to identify a potential predictor or predictors for the outcome variable using p values. Adjusted odds ratios (OR), matching p-values, and 95% confidence intervals (95% CI) were used to display the regression model's results. If an exposure variable's p value was less than 0.05, it was considered significant.

4. Results

4.1. *The Prevalence of Postnatal Depression*

A total of 410 qualifying women were identified during the study period, 399 had agreed, gave written consent and thus participated in the study. With a mean score of 15.87 (SD = ±4.72), the EPDS scores ranged from 0 to 29. Of the 399 individuals, 60.1% (n = 243) had an EPDS score of ≥13, which classified them as positive PPD. The percentages of the sample who were depressed and those that were not displayed in Fig. 1.

Table I shows the socio-demographic and obstetric history with Pearson chi-square comparison for participants with PPD. The mean age (with SD) of the participating

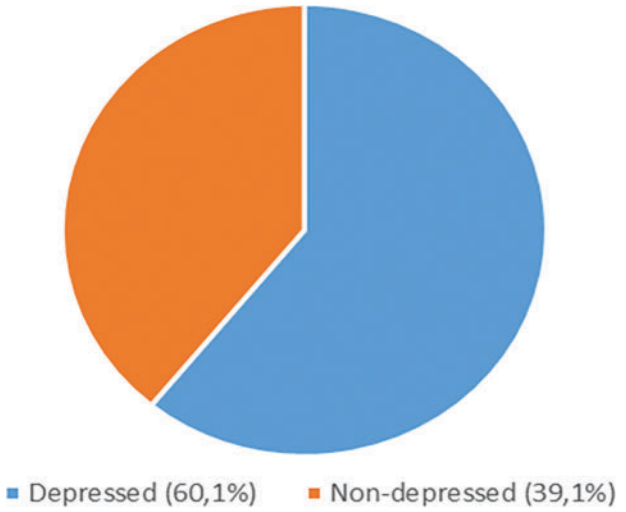

Fig. 1. Prevalence of postpartum depression in the sample.

399 individual women was 26.1 (6.3) years, with the lowest age being 14 and the highest age being 44. Nearly half (49.2%, n = 196) of the sample were in the 20–29 age range, 19.3% (n = 77) were pregnant while still in their teens, 70.1% (n = 280) were single or unmarried, 56.1% (n = 224) had finished matriculation, and 68.4% (n = 273) were still unemployed and enrolled in school. Of them, 28.8%, (n = 115) had a history of live birth baby deaths or pregnancy loss (abortions), while the majority (73.2%, n = 292) had parity between 1 and 2. Of them, 84.5% (n = 341) were using some form of contemporary birth control, with the majority (43.9%, n = 175) accepting injections, and 89.5%, (n = 357) were breast feeding. Of these postpartum women, the majority (64.3%, n = 257) gave birth at hospitals, but nearly one-third (35.7%, n = 142) gave birth at KCHC. The majority of them (61.2%, n = 284) had not made plans for the index pregnancy. As the mode of delivery, the rates for CS and NVD were 15.3% (n = 61) and 84.7% (n = 338), respectively. All women knew their HIV status, 41.7% (n = 170) were HIV-positive, and all HIV infected women were receiving ART.

4.2. Risk Factors for PPD

The cross-table analysis with Pearson chi-square (X^2) and p values were used to test the statistical difference between women with PPD and those without (p value < 0.05). A p-value of less than 0.05 indicated that the following characteristics were substantially linked to PPD: age, parity, job status, use of any family planning method, and mode of delivery. The parameters that were linked to PPD on chi-square were subjected to additional logistic regression; the outcomes are shown in Table II.

PPD was significantly correlated with the mode of delivery (OR = 2.287, p-value < 0.007, 95% CI of 1.256 to 4.165), with those who gave birth vaginally having a higher chance of experiencing depressed symptoms. Full-time workers performed better, with a low OR of 0.459 (p = 0.021 and 95% CI of 0.237 to 0.887). This is consistent with a fair income, which results in perceived financial security or solvency.

5. Discussion

The study highlights that the sample exhibited a notably high mean score of 15.8, alongside a very high prevalence of postpartum depression (PPD) at 60.9%. This underscores both the severity of PPD and the substantial number of affected women. Bivariate analysis revealed a significant correlation between PPD and several specific factors, indicating that adverse social conditions such as higher unemployment rates, single marital status, and unplanned pregnancies—contribute to the increased prevalence of PPD in this population. The rising trend of postpartum depression is evidenced by steadily increasing prevalence rates in South African studies: 45.1% in 2011, 49.3% in 2014, 50.3% in 2015, and peaking at 57.14% in 2020. Notably, the current study's finding of 60.9% prevalence marks the highest reported in South Africa [1], [7]–[9]. This alarming figure is likely a reflection of worsening socioeconomic pressures, including stagnant wages, escalating unemployment, and rising domestic violence rates in SA [14].

Interestingly, full-time employment appears to offer protection against PPD, as evidenced by an odds ratio (OR) of 0.45 for employed women, indicating a lower risk compared to those not employed. Furthermore, the presence of a supportive and reliable partner, stable full-time employment, and higher educational attainment are also associated with reduced risk for PPD.

The risk of depression, which may manifest in the postnatal period, is increased by South Africa's high and rising unemployment rate, particularly among women [23]. SA and other African nations have been reporting greater rates of PPD than high-income nations [24], and SA's higher rates are in line with those of high-income nations [25], such as the USA and Japan, where the prevalence was above 69% [26], [27]. The current study's results are consistent with earlier research showing that most women who scored higher on the EPDS were single and unemployed, which had a detrimental effect on their financial circumstances [9]. According to the findings of other studies, South Africa's substantial wealth disparity is also linked to increased depression symptoms, even in postpartum women [28]. Additionally, research shows that women in rural regions are more likely than those in metropolitan areas to suffer from PPD. For example, according to a study done in South Africa's rural areas, the prevalence of PPD was 50.3% compared to 39.5% [29] in urban areas. Consequently, it is probable that the peri-urban group in our semi-rural context has a higher prevalence of PPD.

There are conflicting results on the mode of delivery and the occurrence of PPD. Some studies revealed no clear correlation between PPD and vaginal delivery, whereas another study found that women who had caesarean sections had a higher chance of developing PPD [30]–[33]. NVD shows a substantial correlation with PPD, according to our study, with a higher OR of 2.3 suggesting that it is a risk factor for PPD. Poor infant nutritional status, low infant birth weight, shorter breastfeeding duration, respiratory illnesses, diarrheal diseases, poor self-rated health, home delivery, decreased quality of mother-infant interaction, and poor linkage to HIV care are among the specific

TABLE I: Demographic and Obstetric Characters with Pearson Chi-Square Comparison for Participants with PPD

	Variables	Actual sample n (%)	PPD n (%)	X^2 values	P values
Age distribution (in years)	< 20 years (Teenage)	77 (19.3)	25 (32.5)	7.82	0.032
	20–29 years	196 (49.1)	112 (57.1)		
	30–39 years	123 (30.8)	79(64.2)		
	>=40 years	3	0		
Relationship status	Single	280 (70.1)	172 (61.4)	1.61	0.446
	Married/Living together	119 (29.6)	71 (60.24)		
Level of education	No formal education	33 (8.5)	19 (57.6)	7.781	0.064
	Completed Primary education	59 (14.7)	37 (62.7)		
	Completed Matric	224 (56.1)	114 (50.9)		
	Higher education (diploma/degrees)	83 (20.7)	49 (59.0)		
Employment status	Full-time employment	70 (17.5)	47 (67.1)	7.819	0.048
	Part-time employment	56 (14.0)	25 (44.8)		
	Student	132 (33.1)	84 (63.6)		
	Unemployed	141 (35.3)	87 (61.7)		
Parity	1–2	292 (73.2%)	169 (57.9)	4.13	0.12
	3–4	92 (23.0)	64 (69.5)		
	5	15 (3.8)			
Death of previous live birth baby or pregnancy loss	Yes	115 (28.8)	71 (61.7)	0.48	0.46
	No	284 (71.2)	172 (60.6)		
Is the new-born still alive?	Yes	395 ()	241 (61.0)	0.957	0.340
	No	4 ()	2 (50.0)		
Was the index pregnancy planned?	Yes	121 (30.2)	73 (60.3)	0.024	0.482
	No	278 (69.8)	170 (61.2)		
HIV status at birth	HIV negative	229 (58.3)	139 (60.6)	0.074	0.964
	HIV positive	170 (41.7)	102 (60)		
Mode of delivery	NVD	338 (84.7)	217 (64.2)	10.105	0.001
	C/section	61 (15.3)	26 (42.6)		
Breast feeding	Yes	357 (89.5)	221 (61.9)	1.431	0.152
	No	42 (10.5)	22 (52.6)		
Using any form of contraceptives	None	58 (14.5)	36 (62.1)	11.859	0.037
	Oral pill	22 (5.5)	18 (81.85)		
	IUCD	14 (3.5)	12 (85.7)		
	Female condom	4 (1)	1 (25.0)		
	Implant	126 (31.6)	69 (54.8)		
	Injectable	175 (43.6)	107 (61.9)		
Place of delivery	KCHC	142 (35.7)	84 (59.2)	0.283	0.335
	Hospitals	257 (64.3)	159 (61.9)		

TABLE II: Logistic Regression Output for Outcome Variable (PPD)

Variables	p-value	OR (adjusted)	95 % C.I. for OR	
			Lower	Upper
Contraceptive method used	0.102			
No contraceptive method used	0.589	1.197	0.624	2.295
Oral pill	0.067	2.917	0.927	9.180
IUCD	0.076	4.193	0.862	20.388
Female condom	0.481	.406	0.033	4.978
Implant	0.377	.804	0.495	1.306
Mode of delivery (NVD)	0.007	2.287	1.256	4.165
Employment status	0.071			
Full time Employment	0.021	0.459	0.237	0.887
Part-time Employment	0.655	1.154	0.616	2.161
Students	0.866	0.948	0.507	1.771

Note. Reference group: CS delivery, unemployment, injectable contraceptive.

risk factors for PPD in Africa [34], [35]. Even while there is now less evidence linking caesarean delivery to PPD, certain studies have found that women who had emergency caesarean sections had a higher risk of developing postpartum depression [36]. A caesarean section, whether an elective or emergency procedure, raises the risk of postpartum depression, which might worsen a patient's mental stress, according to previous research, such as that conducted by Zhao et al. [37]. After a caesarean section, the mother's level of interleukin 6 may increase. Since

interleukin 6 is a crucial cytokine change linked to depression, it acts as a mediator between the two [37]. According to the study, women who had a caesarean section (OR = 1.64) or an instrument-assisted birth (OR = 1.23) are more likely to develop postpartum depression.

Over the course of five years, PPD sufferers are twice as likely to develop depressive episodes in the future, according to research. Socioeconomic disadvantage, unplanned pregnancy, youth, single status, lack of empathy and support from an intimate partner, hostile in-laws, intimate partner violence, lack of emotional and practical support, the birth of a female child in some situations, and a history of mental health issues are risk factors for PPD, according to a recent systematic review [24]. Due to our study's limitations, we have left out these variables. Since this study is one of the first on PPD that eThekwini, our findings are significant for setting programmes (counselling, referrals etc.) since they offer baseline information on maternal mental health, specifically PPD. However, the results give a snapshot of the postpartum women's mental health at a certain moment in time and do not account for events that may have contributed to their depression earlier in life because of the cross-sectional design that was employed. A few instances of these influences are the abuse the mother may have endured as a youngster. Additionally, the design makes it impossible to determine how long depression symptoms may last. The results cannot be extended to other locations with a diverse socioeconomic profile because the study was carried out in a single health institution in a subdistrict where the participants present with little socioeconomic variety. Postpartum women experienced medical conditions may had influenced overestimation of psychological problems like PPD.

The risk for negative outcomes on all child measures, including behavioural, cognitive, social, and physical growth impairment, was found to be significantly increased by PPD [38]–[40]. This research emphasized how important it is to identify and treat moms who exhibit postpartum depression symptoms because neglecting to do so puts the impacted children at risk for a number of detrimental social and health consequences. It is simple to identify and implement therapies for other women in comparable circumstances, given all of the women with postnatal depressive symptoms identified in this study, as well as their infants, are at risk of adverse health consequences. Therefore, PPD screening could be a key tactic to combat South Africa's high rates of infant illness and mortality.

A South African study comparing postpartum HIV infected women with pre-pregnancy HIV treatment experience found that the prevalence of PPD was 10.4% for significant PPD and 14.6% for low to medium PPD [10]. Additionally, one of the largest studies to examine the connection between HIV and PPD in sub-Saharan Africa came to the conclusion that there was no association or correlation between PPD and HIV status [41]. In our study, this is the situation. Women with HIV did not exhibit any correlation with PPD. According to earlier research, this finding suggests that South Africans, both in rural and urban regions, are becoming more accepting of HIV disease [10]. Additionally, other research reveals that borderline personality disorder or borderline personality features are indicated by scores of 13 or above on the EPDS [42], [43], highlighting the need of using the EPDS as a health screening tool for depression and related mental disorders.

6. Conclusion

According to the study, a significant percentage of mothers who have postpartum depression symptoms require treatment but are unable to get it since they have not received a diagnosis, and no intervention has been implemented. Both the mother and the unborn child will suffer grave long-term health consequences as a result of this lack of diagnosis. The quality of care provided by mother and child health services is compromised when routine screening for postnatal depression is delayed, which means the mental health program cannot promote improved maternal and child health outcomes.

7. Recommendations

Similar to earlier research in South Africa, it is advised that all primary health institutions do universal PPD screening. This is especially true given how simple it is to administer the EPDS and how easily it can be incorporated into the routine health promotion process for mothers who visit PHC postnatal clinics.

Acknowledgment

We would like to acknowledge the midwives of KCHC PNC for assisting in implementing the study tool, and the CEO of KCHC for allowing this study to be undertaken.

Author Contributions

AMH–Conceptualization, data verification and analysis, writing report and finalization of the manuscript.

MH–Conceptualization, data capture, verification, coding, analysis and finalization of the manuscript.

RH–Data coding, analysis and finalization of the manuscript.

SB–Conceptualization, writing report and finalization of the manuscript.

Conflict of Interest

The authors declare no conflict of interest.

References

[1] Mokwena K, Masike I. The need for universal screening for postnatal depression in South Africa: confirmation from a subdistrict in Pretoria, South Africa. *Int J Environ Res Public Health*. 2020;17(19):6980. doi: 10.3390/ijerph17196980.

[2] Kathree T, Selohilwe O, Bhana A, Petersen I. Perceptions of postnatal depression and health care needs in a South African sample: the "mental" in maternal health care. *BMC Womens Health*. 2014;14(1):140. doi: 10.1186/s12905-014-0140-7.

[3] Stewart DE, Vigod SN. Postpartum depression: pathophysiology, treatment, and emerging therapeutics. *Annu Rev Med*. 2019;70(1):183–96. doi: 10.1146/annurev-med-041217-011106.

[4] Norhayati NM, Hazlina NN, Asrenee A, Emilin WMAW. Magnitude and risk factors for postpartum symptoms: a literature review. *J Affect Disord*. 2015;175(3):34–52. doi: 10.1016/j.jad.2014.12.041.

[5] Chi X, Zhang P, Wu H, Wang J. Screening for postpartum depression and associated factors among women in China: a cross-sectional study. *Front Psychol*. 2016;7(597):1668. doi: 10.3389/fpsyg.2016.01668.

[6] Halbreich U, Karkun S. Cross-cultural and social diversity of prevalence of postpartum depression and depressive symptoms. *J Affect Disord*. 2006;91(2–3):97–111. doi: 10.1016/j.jad.2005.12.051.

[7] Peltzer K, Shikwane ME. Prevalence of postnatal depression and associated factors among HIV-positive women in primary care in Nkangala district, South Africa. *S Afr J HIV Med*. 2011;12(4):24. doi: 10.4102/sajhivmed.v12i4.168.

[8] Mokwena K, Shiba D. Prevalence of postnatal depression symptoms in a primary health care clinic in Pretoria, South Africa: management of health care services. *Afr J Phys Health Educ Recreat Dance*. 2014;20(Suppl. 1):116–27.

[9] Stellenberg EL, Abrahams JM. Prevalence of and factors influencing postnatal depression in a rural community in South Africa. *Afr J Prim Health Care Fam Med*. 2015;7(1):1–8. doi: 10.4102/phcfm.v7i1.874.

[10] Mokhele I, Nattey C, Jinga N, Mongwenyana C, Fox MP, Onoya D. Prevalence and predictors of postpartum depression by HIV status and timing of HIV diagnosis in Gauteng, South Africa. *PLoS One*. 2019;14(4):e0214849. doi: 10.1371/journal.pone.0214849.

[11] England S, Ballard C, George S. Chronicity in postnatal depression. *Eur J Psychiatry*. 1994;8(2):93–6.

[12] Keller MC, Nesse RM. The evolutionary significance of depressive symptoms: different adverse situations lead to different depressive symptom patterns. *J Pers Soc Psychol*. 2006;91(2):316. doi: 10.1037/0022-3514.91.2.316.

[13] Schmied FJ, Teichert C, Kappel L, Hirn U, Bauer W, Schennach R. What holds paper together: nanometre scale exploration of bonding between paper fibres. *Sci Rep*. 2013;3(1):2432. doi: 10.1038/srep02432.

[14] Anokye R, Acheampong E, Budu-Ainooson A, Obeng EI, Akwasi AG. Prevalence of postpartum depression and interventions utilized for its management. *Ann Gen Psychiatry*. 2017;17(1):1–8.

[15] World Health Organization. *Standards for Improving Quality of Maternal and Newborn Care in Health Facilities*. Geneva: World Health Organization; 2016.

[16] South African National Department of Health. South African maternal, perinatal, and neonatal health policy. 2021. Available from: https://knowledgehub.health.gov.za/elibrary/south-african-maternal-perinatal-and-neonatal-health-policy.

[17] Kufa-Chakezha T, Shangase N, Singh B, Cutler E, Aitken S, Cheyip M, *et al. The 2022 Antenatal HIV Sentinel Survey: Key Findings*. South Africa: Public Health Bull; 2023.

[18] National Department of Health, South Africa. *Guidelines for Maternity Care in South Africa—A Manual for Clinics, Community Health Centres and District Hospitals*. Pretoria: NDoH; 2016.

[19] Giri RK, Khatri RB, Mishra SR, Khanal V, Sharma VD, Gartoula RP. Prevalence and factors associated with depressive symptoms among post-partum mothers in Nepal. *BMC Res Notes*. 2015;8(1):111. doi: 10.1186/s13104-015-1074-3.

[20] Abdollahi F, Lye MS, Zain AM, Ghazali SS, Zarghami M. Postnatal depression and its associated factors in women from different cultures. *Iran J Psychiatry Behav Sci*. 2011;5:5–11.

[21] Cox JL, Chapman G, Murray D, Jones P. Validation of the Edinburgh Postnatal Depression Scale (EPDS) in non-postnatal women. *J Affect Disord*. 1996;39(3):185–9. doi: 10.1016/0165-0327(96)00008-0.

[22] Lawrie TA, Hofmeyr GJ, De Jager M, Berk M. Validation of the Edinburgh Postnatal Depression Scale on a cohort of South African women. *S Afr Med J*. 1998;88(10):1340–4.

[23] Statistics South Africa. Unemployment rate. Pretoria: Statistics South Africa; 2019. Available from: www.statssa.gov.za. [Accessed 2019 Sep 18].

[24] Fisher J, Cabral de Mello M, Patel V, Rahman A, Tran T, Holton S, *et al*. Prevalence and determinants of common perinatal mental disorders in women in low- and lower-middle-income countries: a systematic review. *Bull World Health Organ*. 2012;90(2):139–49G. doi: 10.2471/BLT.11.091850.

[25] Rollè L, Giordano M, Santoniccolo F, Trombetta T. Prenatal attachment and perinatal depression: a systematic review. *Int J Environ Res Public Health*. 2020;17(8):2644. doi: 10.3390/ijerph17082644.

[26] Gelaye B, Rondon MB, Araya R, Williams MA. Epidemiology of maternal depression, risk factors, and child outcomes in low-income and middle-income countries. *Lancet Psychiatry*. 2016;3(10):973–82. doi: 10.1016/S2215-0366(16)30284-X.

[27] Evagorou O, Arvaniti A, Samakouri M. Cross-cultural approach of postpartum depression: manifestation, practices applied, risk factors and therapeutic interventions. *Psychiatry Q*. 2016;87(1):129–54. doi: 10.1007/s11126-015-9367-1.

[28] Adjaye-Gbewonyo K, Avendaño M, Subramanian SV, Kawachi I. Income inequality and depressive symptoms in South Africa: a longitudinal analysis of the National Income Dynamics Study. *Health Place*. 2016;42(1):37–46. doi: 10.1016/j.healthplace.2016.08.013.

[29] Tsai AC, Tomlinson M, Comulada WS, Rotheram-Borus MJ. Intimate partner violence and depression symptom severity among South African women during pregnancy and postpartum: population-based prospective cohort study. *PLoS Med*. 2016;13(1):e1001943. doi: 10.1371/journal.pmed.1001943.

[30] Kumwar D, Corey EK, Sharma P, Risal A. Screening for postpartum depression and associated factors among women who deliver at a University Hospital. *Nepal Kathmandu Univ Med J (KUMJ)*. 2015;13(1):44–8. doi: 10.3126/kumj.v13i1.13752.

[31] Eckerdal P, Georgakis MK, Kollia N, Wikstrom A-K, Hogberg U, Skalkidou A. Delineating the association between mode of delivery and postpartum depression symptoms: a longitudinal study. *Acta Obstet Gynecol Scand*. 2018;97(3):301–11. doi: 10.1111/aogs.13275.

[32] Kaya L, Çiğdem Z. The relationship between mode of delivery and postpartum depression. *J Educ Health Promot*. 2019;8(1):5. doi: 10.4103/jehp.jehp_97_18.

[33] Houston KA, Kaimal AJ, Nakagawa S, Gregorich SE, Yee LM, Kuppermann M. Mode of delivery and postpartum depression: the role of patient preferences. *Am J Obstet Gynecol*. 2015;212(2):229.e1–e7. doi: 10.1016/j.ajog.2014.09.002.

[34] Gold K, Spangenberg K, Wobild P, Schwenke TL. Depression and risk factors for depression among mothers of sick infants in Kumasi. *Ghana Int J Gynaecol Obstet*. 2013;130(3):228–31. doi: 10.1016/j.ijgo.2012.09.016.

[35] Målqvist M, Clarke K, Matsebula T, Bergman M, Tomlinson M. Screening for antepartum depression through community health outreach in Swaziland. *J Community Health*. 2016;41(5):946–52. doi: 10.1007/s10900-016-0175-9.

[36] Robertson E, Grace S, Wallington T, Stewart DE. Antenatal risk factors for postpartum depression: a synthesis of recent literature. *Gen Hosp Psychiatry*. 2004;26(4):289–95. doi: 10.1016/j.genhosppsych.2004.02.006.

[37] Zhao XH, Zhang ZH. Risk factors for postpartum depression: an evidence-based systematic review of systematic reviews and meta-analyses. *Asian J Psychiatr*. 2020;53:102353. doi: 10.1016/j.ajp.2020.102353.

[38] National Department of Health, South Africa. Health [homepage on the Internet]. [cited 2022 Apr 24]. Pretoria: South African Government. Available from: https://www.gov.za/aboutsa/health#:.

[39] National Department of Health, South Africa. Health [homepage on the Internet]. [cited 2024 Apr 24]). Pretoria: South African Government. Available from: https://www.gov.za/aboutsa/health#:.

[40] Africa Statistics South. Provincial projection by sex and age (2002-2018). Statistics South Africa. 2018 [cited 2024, April 22]. Available from: https://southafrica.opendataforafrica.org/topryig/provincial-projection-by-sex-and-age-2002-to-2018?province=1000000-south-africa.

[41] Nweke M, Ukwuoma M, Adiuku-Brown AC, Ugwu P, Nseka E. Characterization and stratification of the correlates of postpartum depression in sub-Saharan Africa: a systematic review with meta-analysis. *Womens Health*. 2022;18:17455057221118773.

[42] Judd F, Lorimer S, Thomson RH, Hay A. Screening for depression with the Edinburgh Postnatal Depression Scale and finding borderline personality disorder. *Aust N Z J Psychiatry*. 2019;53(5):424–32. doi: 10.1177/0004867418804067.

[43] Howard L, Ryan EG, Trevillion K, Anderson F, Bick D, Bye A, *et al.* Accuracy of the Whooley questions and the Edinburgh Postnatal Depression Scale in identifying depression and other mental disorders in early pregnancy. *Br J Psychiatry*. 2018;212(1):50–6. doi: 10.1192/bjp.2017.9.