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Depression and Perceived Stress among Perinatal Women Living with HIV in Ibadan, Nigeria

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Abstract: Background: Pregnancy can be a period of increased psychological susceptibility for women living with HIV. This study aimed to determine the prevalence and factors associated with depression and psychological stress among women living with HIV during their perinatal period in Ibadan, Nigeria. **Methods:** This study was a facility-based cross-sectional survey conducted in three HIV treatment centers. The study population consisted of women living with HIV 18 years and above who were pregnant or had given birth within the last two years. Data obtained were analyzed using Statistical Package for Social Science version 25. **Results:** A total of 402 participants were eligible for this study. About 69.0% and 78.0% of the participants were depressed and had perceived stress respectively. Women who had positive partners (OR=0.60, 95% CI=0.20-1.30) were found to be significantly associated with perceived depression. Women who reported having a gestational age between 29-40 weeks (OR=0.054 95% CI = 0.006, 0.500) were found to be significantly associated with perceived stress. Factors associated with the co-occurrence of symptoms of depression and perceived stress were partner status, income level, family support, gestational age, and years on ART. **Conclusions:** Given the high prevalence of major depression, perceived stress, and the co-occurrence of depression and perceived stress among women living with HIV, mental health care should be incorporated into the routine maternal healthcare for all women, especially those living with HIV.

Keywords: depression; stress; HIV; pregnancy

Introduction

For decades, the HIV epidemic remains a significant global health challenge, with an estimated 38 million individuals infected globally[1]. Sub-Saharan Africa (SSA) accounts for 71% of the global population of people living with HIV (PLWH)[2], with a prevalence rate of 1.4% in Nigeria making it the third most HIV-burdened country[2]. The burden of HIV in Nigeria is the highest among the female adult population and a known predisposition of maternal mortality with an estimated prevalence of 26.4% among pregnant cohorts [3, 4].

More women have been reported to have symptoms of depression in comparison to men and this gendered pattern has also been found to exist among PLWH[5-7]. WLWH especially in low and middle-income countries (LMICs), experience significant psychological challenges, such as depression, stress, and anxiety, as a result of their HIV diagnosis[8, 9]. Studies have also shown that WLWH is susceptible to suffering from more severe symptoms of mental illnesses such as depression, anxiety, and posttraumatic stress disorder[7, 10].

Pregnancy and postpartum periods are some of the most vulnerable periods that may contribute to symptoms of depression in women[11]. The prevalence of depressive symptoms among pregnant

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women ranges from 11.4% to 40.0%, which is higher than that of women generally[12, 13]. In a study conducted in Nigeria, the prevalence of postpartum depression was found to be 35.6%[14]. Pregnant women frequently experience stress as well. Women's brains change structurally, psychologically, and behaviourally throughout pregnancy as they prepare for their new role as mothers[15]. These changes, however, make pregnant women more prone to stress[16], which increases the likelihood of developing prenatal depression symptoms[17].

Pregnancy can be a period of increased psychological susceptibility for WLWH due to a variety of environmental factors, disclosure concerns, and HIV-related stigma[18]. Studies conducted in LMICs, have found that pregnant and postpartum WLWH suffer from a high prevalence of depression[19-21]. Similarly, a systematic review was conducted in Africa which examined the prevalence of perinatal depression in HIV-infected women. The weighted mean prevalence of antenatal and postnatal depression was 23.4% and 22.5%, respectively[22]. Depression has also been found to be associated with adherence to care and therapy among pregnant WLWH[21] which may result in treatment failure and increased vertical HIV transmission[8]. Additionally, psychological issues such as depression and stress may also have adverse effects on obstetric and neonatal outcomes and increase the risk of mother-to-child transmission (MTCT)[23].

Women, particularly in developing countries, are more likely to be exposed to risk factors such as poor socioeconomic status which make them more susceptible to the development of perinatal depression[24]. Depression and psychological stress may act as critical barriers to HIV treatment and prevention as the conditions may be linked. Women are often newly diagnosed with HIV during pregnancy and receive a positive HIV diagnosis in an event that can generate worry as well as fear of transmitting the virus to an unborn child[25].

Mental health disorders in pregnant WLWH must be understood in the context of women's life circumstances. Understanding the magnitude of depression and stress, as well as their associated factors, among pregnant WLWH could provide important information that could aid in the mitigation of the poor mental health experienced by this group of women. To our knowledge, this study is among the few studies that have investigated the prevalence of depression and psychological stress among WLWH during pregnancy and the postpartum period in Nigeria. Thus, the present study aimed to determine the prevalence and factors associated with depression and psychological stress among WLWH during their perinatal period in Ibadan, Nigeria.

Materials and Methods

Study Design and Setting

This study was a facility-based cross-sectional survey conducted in three (3) HIV treatment centers in Ibadan. The centers were; State Hospital, Adeoyo, Ringroad; Adeoyo Maternity Health Centre; and St Annes Anglican Hospital, Molete. A purposive sampling method was adopted in selecting the health facilities because anti-retroviral treatment is not available in all health facilities. Thus, the health institution provides comprehensive HIV services in addition to antenatal, delivery, and postnatal care.

Study Participants

The participants were randomly selected from the three HIV treatment facilities in Ibadan between September and November 2022. The study population consisted of WLWH over the age of 18 who were pregnant or had given birth within the last two years and were attending any of the three selected anti-retroviral treatment clinics in Ibadan, Oyo state, Nigeria. The exclusion criteria were women who had existing mental illnesses or were unable to provide explicit consent.

Data Collection

All the questionnaires were interviews administered to WLWH receiving treatment at any of the three anti-retroviral treatment clinics during the course of the study. 402 consented WLWH were enrolled in the study. Before administering the questionnaire, participants were provided with

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information sheets outlining the objective and scope of the study which was duly explained to the participants in English language or the local dialect (Yoruba).

Questionnaire

A structured questionnaire composed in the English language was administered to the participants, and clarification was provided by the investigators when requested. The questionnaire was divided into two sections. Section one obtained information on the participants' social demographic, relationship, and support-related, behavioral, clinical, and pregnancy-related characteristics. After completing the first section, the participants were counseled to select their desired answers in section two, which assessed depression using the Edinburgh Postnatal Depression Scale (EPDS)[26] and perceived stress using the Perceived Stress Scale-10 (PSS-10)[27]. The questions were explained verbally in the requisite local language (Yoruba) for those not fluent in English.

The Edinburgh Postnatal Depression Scale was used to assess symptoms of perinatal depression. The scale has 10 items with responses on a 4-point Likert scale ranging from 0 (absence of depressive moods) to 3 (worst mood). A total score ranging from 0 to 30 is calculated, and a cut-off point of ≥12 indicates an increased likelihood of clinical depression. The scale does not mention the words pregnancy, child, birth, or infant and has also been validated in a non-pregnant population.

Perceived stress was measured using the Perceived Stress Scale. The Perceived Stress Scale (PSS) is a 10-item self-report assessment of the stress domains of unpredictability, lack of control, burden overload, and stressful life circumstances. Responses are on a 5-point Likert scale ranging from 0 (never) to 4 (very often). The PSS score is the sum of all responses with higher scores indicating more perceived stress and can range from 0 to 40.

Statistical Analysis

Data obtained from the completed questionnaire and assessment tools were analyzed using Statistical Package for Social Science version 25. Descriptive statistics of demographic information for each participant were computed. Descriptive statistics were also used to describe the prevalence of depression and perceived stress. Factors associated with depression and perceived stress were evaluated using multivariate logistic regression.

Ethical Considerations

Ethical approval was obtained from the Lead City University Health Research and Ethics Committee (LCU-REC/22/125) as well as from the Oyo State Ministry of Health Research Ethics Committee (AD 13/479/44539).

RESULTS

Sociodemographic characteristics of participants

A total of 402 participants were eligible in this study and the mean value of their age was 35.8 years (SD = 6.60 years). A total of 225 (56.0%) participants identified as Christians, the majority 92.3% of them were married and 352 (87.6%) participants were from the Yoruba tribe. Concerning their level of education, those who attained a secondary school education were the majority with 173 (43.0%) participants, while 334 (83.1%) participants were employed and 234 (58.2%) of the participants earn an income below 20,000.00 NGN. (See Table 1)

Table 1. Characteristics of study participants (n =402).

Characteristics	Total n=402	Antenatal (n=263)	Postnatal (n=139)
Age (n=402)			
Mean (S.D)	35.8(6.6)		
Religion			
Christianity	225	150(57%)	75(54%)

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Islam	176	113(43%)	64(46%)
Tribe			
Yoruba	352	225(85.6)	127(91.4)
Igbo	29	21(8)	8(5.8)
Hausa	20	16(6)	4(2.9)
Others	1	1(0.4)	0
Level of Education			
Primary Level	94	53(20.2)	41(29.5)
Secondary Level	173	107(40.7)	66(47.5)
Tertiary Level	90	68(25.9)	22(15.8)
None	45	35(13.3)	10(7.2)
Marital Status			
Married	371	246(93.5)	125(89.9)
Divorced	9	6(2.3)	3(2.2)
Widowed	8	7(2.7)	1(0.7)
Separated	8	4(1.5)	4(2.9)
Single	6	0	6(4.3)
Type of Partner			
Spouse	373	247(93.9)	126(90.6)
Steady	11	7(2.7)	4(2.9)
Casual	10	7(2.7)	3(2.2)
None	8	2(0.8)	6(4.3)
Employment Status			
Employed	334	225(85.6)	109(78.4)
Unemployed	68	38(14.4)	30(21.6)
Income Level			
<20,000	234	157(59.7)	77(55.4)
20,000-30,000	48	19(7.2)	29(20.9)
31,000-40,000	77	60(22.8)	17(12.2)
41,000-50,000	27	13(4.9)	14(10.1)
>51,000	16	14(5.3)	2(1.4)

Relationship and support-related, clinical, and pregnancy-related characteristics of participants

Out of the 402 participants that were interviewed 335 were aware of their partner's status; with 152 having positive partners. 246 (61.2%) had disclosed their status to their partners. 318 participants reported receiving adequate support from their partner and 287 reported receiving support from family and friends. All participants in the study sample had started anti-retroviral therapy at the time of their interview. The majority (48.3%) had been on ART for between 1 – 5 years. Most of the participants (93%) were virally suppressed with a viral load below 50 copies/mL. Out of the total participants, 263 (65.4%) were pregnant, 109 reported a gestational age of 5-13 weeks, 85 reported 14-28 weeks, and 69 reported 29-40 weeks. Only 73 (18.2%) of the women reported that the pregnancy was planned compared to 190 (47.3%) with an unplanned pregnancy. (See Table 2)

Depression and perceived stress among pregnant WLHIV

About 69% of the participants were depressed and 78% had perceived stress. According to this study, depression and stress were significantly associated. (See Table 3)

Table 2. Relationship and support-related clinical and pregnancy-related characteristics.

Characteristics	Total	Antenatal (%)	Postnatal (%)
Partners Status(n=402)			
Positive	157	118(44.9)	39(28.1)

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Negative	178	97(36.9)	81(58.3)
Not applicable	67	48(18.2)	19(13.7)
Status Disclosure to partner (n=402)			
Yes	246	153(58.2)	93(66.9)
No	148	108(41.1)	40(28.8)
Not applicable	8	2(0.8)	6(4.3)
Perceived Social Support			
Support from partner (n=402)			
Yes	318	218(82.8)	100(72)
No	76	43(20.9)	33(23.8)
Not applicable	8	2(0.8)	6(4.3)
Support from other family and friends (n=402)			
Yes	287	56(40.3)	83(59.7)
No	115	59(22.4)	56(40.3)
History of Conflict with Partner			
Yes	128	80(30.4)	48(34.5)
No	266	181(68.8)	85(61.2)
Not applicable	8	2(0.8)	6(4.3)
Years On ART(n=402)			
≤ 1 Year	85	50(19)	35(25.2)
≤ 5 Years	194	136(51.7)	58(41.7)
>5 Years	77	46(17.5)	15(10.8)
> 10 Years	46	31(11.8)	31(22.3)
Viral Load			
<50 copies/mL	374	243(92.4)	131(94.2)
≥ 50 copies/mL	19	13(4.9)	6(4.3)
Target Not Detected (TND)	9	7(2.7)	2(1.4)
Problems in Previous Pregnancy (n=402)			
Yes	175	104(39.5)	64(46)
No	227	159(60.5)	75(54)
Planned Pregnancy (n=263)			
Yes	73	73(27.8)	N/A
No	190	190(72.2)	N/A
Gestational Age (n=263)			
5-13 weeks	109	109(41.4)	N/A
14-28 weeks	85	85(32.3)	N/A
29-40 weeks	69	69(26.3)	N/A

Table 3. Prevalence of Depression and Perceived Stress.

Table 3a: Depression.

Variable	Total (%)	Antenatal (%) n=263	Postpartum n=139
No Depression	124(30.8)	85(32.3)	39(28.1)
Probable Depression	34(8.4)	16(6.1)	18(12.9)
Depressed	244(60.7)	162(61.6)	82(59)

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Table 3b: Perceived stress.

Variable	Total (%)	Antenatal (%) n=263	Postpartum n=139
Low Stress	87(21.6)	67(25.5)	20(14.4)
Moderate Stress	310(77.1)	194(73.8)	116(83.5)
High Stress	5(1.3)	2(0.8)	3(2.2.)

Table 3c: Depression and perceived stress.

Variable	Depression (EPDS≥13)			P-value
	Overall	Antenatal Depression	Postpartum Depression	
Low Stress	13	8	5	0.000*
Moderate Stress	226	152	74	
High Stress	5	2	3	

Factors associated with perinatal depression

In the multivariate logistic regression model which examined factors associated with depressive symptoms (see Table 4), the status of the partner, income level, and gestational age was found to be significantly associated with depression. Women who had positive partners had lower higher odds of depression compared with women who had negative partners (OR=0.6, 95% CI =0.2-1.3). Women who earned an income below 20,000.00 Nigeria naira had 7.0 times higher odds of possible depression compared with women who earned more (OR=7.0, 95% CI= 1.2-40.9). Women who reported having a gestational age above 14 weeks had 5 times higher odds of depression (OR=4.7, 95% Cl=1.7-12.6).

Table 4. Factors of perinatal depression.

Variable	Depression (EPDS ≥ 13)			Odd Ratio	P-value
	Overall	Antenatal	Postpartum		
Status of Partner					
Positive	110	82	28	0.560(0.242, 1.297)	0.012
Negative	103	60	43	Ref	
Status Disclosure					
No	158	109	49	4.750(0.681,33.131)	0.092
Yes	82	52	30	Ref	
Income Level					
<20,000	121	72	49	6.963(1.184,40.951)	0.032
20,000-30,000	37	19	18	3.046(0.421,22.041)	0.270
31,000-40,000	60	52	8	5.481(0.808,37.179)	0.082
41,000-50,000	16	11	5	4.768(0.552,41.182)	0.156
>51,000	10	8	2	Ref	
Support from Other Family and Friends					
No	84	49	35	0.500(0.246,1.015)	0.050
Yes	160	113	47	Ref	
History of Conflict with Partner					
No	140	99	41	2.462(1.315,4.608)	0.005
Yes	100	62	38	Ref	
Gestational Age					
14-28 weeks	73	73	N/A	4.677(1.740,12.574)	0.002
29-40 weeks	54	54	N/A	0.219(0.059, 0.817)	0.024

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5-13 weeks	35	35	N/A	Ref	
Problems in Previous Pregnancy					
No	37	37	N/A	1.323(0.758,2.309)	0.325
Yes	125	125	N/A	Ref	
Years on ART					
≤ 1 Year	48	28	20	2.007(0.996,4.044)	0.051
≤ 5 Years	102	74	28	1.869(1.008,3.465)	0.047
> 5 Years	56	34	22	Ref	
> 10 Years	38	26	12	0.623(0.236,1.643)	0.339

Factors associated with perceived stress

Following a multivariate logistic regression model examining factors associated with perceived stress, gestational age was found to be significantly associated with perceived stress. (See Table 5)

Table 5. Factors associated with perceived stress.

Variable	Stress(PSS-10 ≥ 14)			Odd Ratio	P-value
	Overall	Antenatal	Postnatal		
Status of Partner					
Negative	148	113	35	0.363(0.104,1.266)	0.112
Positive	166	95	71	Ref	
Status Disclosure					
No	138	102	36	2.026(0.173,23.757)	0.574
Yes	228	145	83	Ref	
Income Level					
<20,000	218	147	71	0.193(0.041,0.915)	0.038
20,000-30,000	46	19	27	0.078(0.078,0.009)	0.019
31,000-40,000	72	59	13	0.316(0.052,1.917)	0.210
41,000-50,000	24	12	12	0.277(0.0.035,2.177)	0.222
>51,000	13	11	2	Ref	
Support from other family and friends					
No	107	55	52	0.632(0.240,1.663)	0.353
Yes	266	193	73	Ref	
Gestational Age					
14-28 weeks	84	84	N/A	0.323(0.083,1.261)	0.104
29-40 weeks	61	61	N/A	0.054(0.006, 0.500)	0.010
5-13 weeks	103	103	N/A	Ref	
Problems in Previous pregnancy					
No	214	150	64	1.489(0.613,3.620)	0.379
Yes	159	98	61	Ref	
Years on ART					
≤ 1 Year	84	50	34	0.214(0.023,1.970)	0.174
≤ 5 Years	175	123	52	1.875(0.611,5.753)	0.272
> 5 Years	73	46	27	Ref	
> 10 Years	41	29	12	2.175(0.552,8.568)	0.267

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Factors associated with the co-occurrence of depression and perceived Stress

A multivariate logistic regression model was used to examine the factors associated with the co-occurrence of symptoms of depression and perceived stress. Table 6 showed the status of the partner, income level, support from other family and friends, history of conflict with the partner, whether the pregnancy was planned, gestational age, having problems in a previous pregnancy, and years on ART were significant predictors. Women who earned an income below 20,000.00 NGN had 6 times higher odds of possible depression and perceived stress compared with women who earned more (OR=5.7, 95% CI 1.1-7.8). Women that had planned pregnancies had lower odds of experiencing depression and perceived stress when compared with those that had planned pregnancies (OR=0.3, 95% Cl =0.1-0.8). Also, women who reported experiencing problems in a previous pregnancy were twice as likely to experience a co-occurrence of depression and perceived stress (OR=2.1, 95% Cl =1.6-3.8). Women who reported having a gestational age above 14 weeks had 4.7 times higher odds of depression and perceived (OR=4.7, 95% Cl =4.0-5.5). Women that reported being on ART for 2 to 5 years as of the time of the survey were also found 2.3 times higher odds of experiencing a co-occurrence of depression and perceived stress(OR=2.3, 95% Cl =1.3-4.3).

Table 6. Factors of depression and perceived stress.

Variable	Depression and Stress (EPDS ≥ 13, PSS-10 ≥ 14)			Odd Ratio	P-value
	Overall	Antenatal	Postpartum		
Status of Partner					
Positive	108	80	28	0.389(0.165,0.915)	0.031
Negative	122	70	52	Ref	
Status Disclosure					
No	84	53	31	0.571(0.270,10.735)	0.571
Yes	170	112	58	Ref	
Income Level					
<20,000	124	73	51	5.690(1.050,7.832)	0.044
20,000-30,000	39	19	20	1.706(0.256,11.363)	0.581
31,000-40,000	63	52	11	2.973(0.491,17.998)	0.236
41,000-50,000	21	12	9	2.781(0.353,21.921)	0.332
>51,000	12	10	2	Ref	
Support from other family and friends					
No	89	117	53	0.488(0.244,0.976)	0.042
Yes	170	49	40	Ref	
History of Conflict with Partner					
No	156	106	50	2.462(1.315,4.608)	0.005
Yes	98	39	59	Ref	
Planned Pregnancy					
Yes	35	35	N/A	0.348(0.149, 0.819)	0.015
No	131	131	N/A	Ref	
Gestational Age					
29-40 weeks	52	52	N/A	3.673(1.339,10.077)	0.012
14-28 weeks	79	79	N/A	4.677(0.042,0.529)	0.003
5-13 weeks	35	35	N/A	Ref	
Problems in Previous Pregnancy					
Yes	106	52	54	2.106(1.157,3.833)	0.015

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No	153	114	39	Ref	
Years on ART					
≤ 1 Year	53	31	22	1.988(0.997,3.963)	0.051
≤ 5 Years	112	75	37	2.343(1.282,4.281)	0.006
> 5 Years	59	36	23	1.016(1.061,0.430)	0.971
> 10 Years	35	24	11	Ref	
Viral Load					
Target not detected (TND)	7	6	1	0.446(0.046,4.289)	0.485
<50 copies/mL	243	154	89	0.901(0.272,2,982)	0.864
>=50 copies/mL	9	6	3	Ref	

Discussion

This study determined the prevalence and factors associated with depression and psychological stress among WLWH during their perinatal period in Ibadan, Nigeria. The study results show a high prevalence of perinatal symptoms (60.7%) with antenatal depression and postpartum depression having a prevalence of 61.6% and 58.9% respectively. The prevalence of perinatal depression is higher than 38.4% in a similar study in Ethiopia [21]. The prevalence of antenatal depression of 61.6% as measured by the EPDS with a cut-off ≥13 is slightly higher than the prevalence found in a previous study in Ekiti State, Nigeria (49.5%)[28], 47.6% in Addis Ababa, Ethiopia [21], and 52.5% in India among women on ART [29]. The differences in prevalence might be due to differences in sociodemographic characteristics and tools used to assess depression. However, this finding buttresses the need to integrate mental health services into routine HIV care services especially among women to mitigate the adverse associated with maternal and child outcomes.

In the current study, the mean perceived stress was 20.01. This indicates moderate stress among WLHIV during the perinatal period. This finding is consistent with what was reported in another study carried out in Nigeria, in which the mean perceived stress was moderate among the study population[30]. The level of stress among the participants plausible predisposes to higher risks of mental disorders as it is in the general population and settings with social inequalities [31]. Stress is an important risk factor for depressive symptoms [32]. Similar to other studies, it was found that women within the study sample that reported depressive symptoms (64.0%) reported significantly higher levels of perceived stress than women without depressive symptoms (28.0%).

This study used multivariate analysis to highlight factors associated with perinatal depression and perceived stress in a sample of WLWH recruited from ART clinics. The study found that the status of the partner of participants was significantly associated with depression and perceived stress. With an odds ratio of 0.389, participants with a positive partner were less likely to report symptoms of depression and perceived stress as compared to women with negative partners. This may be due to the social support provided by a positive partner as opposed to a negative partner. Studies also corroborate that having a positive partner increases the likelihood of having access to help when sick, general support in form of finances as well as HIV-specific support [33]. According to the study, participants who earned below 20,000 were 5.6 times more likely to report symptoms of depression and perceived stress. The results are consistent with those reported in studies in Ethiopia and South Africa, which presented that low income and unemployment were related to depression among HIV-positive women [24, 34]. The reason could be that in low-income countries, women are pressured to default academics for poverty-related factors, which later result in their more prominent engagement in domestic work, as well as the lack of access to health education and awareness. This is ascribed to the possible negative interaction between mental disorders (e.g., depression) and poverty, primarily because, in principle, people with depression commonly perform poorly in their daily tasks [35]. In addition, pregnancy may decrease their employability and even their potential to work because of the type of labor impoverished women may need to undertake [36].

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The results from this study also revealed that having a planned pregnancy (OR=0.348, 95% Cl 0.149-0.819), is indicative of a lower likelihood of reporting symptoms of depression and perceived stress during the perinatal period. According to the study, pregnant women within their second (14-28 weeks) and third (29-40 weeks) trimesters were more likely to report symptoms of depression and perceived stress with odds of 4.7 and 3.7 respectively. This is in contrast with other studies which have reported no association between gestational age and depression among women living with HIV. This could be due to physiological changes which take place during this period which may be inclinatory to the development of depression. It could also be due to heightened anxiety during the third trimester [37, 38]. This study indicates having problems in a previous pregnancy (OR = 2.10) was significantly associated with the co-occurrence of depression and perceived stress. This indicates that women living with HIV that had complications in their previous pregnancy were twice as likely to report symptoms of depression and perceived stress as compared to those that did not. This could be a result of the complications being events that were highly severe and stressful to them. This finding is in line with previous studies which reported that having previous complications in pregnancy is a significant factor in the development of depression [39].

Conclusion

This study reveals a substantial prevalence of depression, perceived stress, and the co-occurrence of depression and perceived stress in the population of WLHIV. The study recommends that screening for prenatal and postpartum depression and access to mental health interventions should be part of routine maternal healthcare for all women, especially those living with HIV.

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