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The prevalence of postnatal depression and associated factors among clinic attendees in Maseru, Lesotho

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Abstract

The purpose of the study was to screen for postnatal depression (PND) symptoms among women attending primary health care (PHC) facilities within Maseru City Council in Lesotho. The Edinburg Postnatal Depression Scale (EPNDS) was used to screen for PND symptoms in a sample of 393 postnatal mothers, and a quantitative questionnaire was used to collect socio-demographic data. The Pearson chi-test of association was used to explore associations between socio-demographic variables and EPND scores ($p<0.05$). The ages of the participants ranged from 17 to 40, with a mean of 27 years. Most were married (n = 310, 78.88%) and unemployed (n = 254, 64.63%), with high school as their highest level of education (n = 272, 69.21%). The majority (n = 312, 79.6%) had between 1 and 2 children. A third of the sample were HIV positive (n = 117, 29.77%). The prevalence of PND symptoms was 43%. Social support, financial support from the partner, relationships with the partner, knowledge of HIV status, and having experienced a severe financial crisis were significantly associated with PND symptoms. On multivariate logistic regression, only financial support from a partner and having experienced a severe financial crisis remained significantly associated with the development of PND ($p = 0.05$). Risk factors for PND are mostly socio-economic. The high prevalence of PND highlighted the need to integrate routine screening of mothers for PND, which will enable early diagnosis and treatment and thus contribute to the improvement of maternal and child well-being in the country.

Keywords: Developing countries, Edinburgh postnatal depression scale, Lesotho, Maternal mental health, postnatal depression, Primary health care clinics.

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1. Introduction

Although post-natal depression (PND) is a major global public concern, it affects developing countries more [1-4]. In Sub-Saharan Africa, including Lesotho, PND is still largely under-reported and neglected [5]. PND often peaks within 4-6 weeks after childbirth [6], but symptoms can persist for up to 4 years [7, 8], during which time it impacts negatively on the health and social well-being of the mother, her child, and the whole family.

The main symptoms of PND include a decreased mood with overwhelming feelings of sadness, apathy, guilt, and worry. Affected mothers also experience reduced enjoyment and a loss of interest in daily activities, with consequential difficulties in coping with their maternal responsibilities [9]. The sleeping difficulties, diminished concentration, fatigue, changes in appetite, continuous crying, and contemplating self-harm [10, 11] significantly compromise the quality of life of the woman, resulting in strained interpersonal relationships. PND has also been associated with risky behavioral tendencies, such as substance abuse [12], which further compromises the ability of the woman to care for her child.

Infants of post-nasally depressed mothers are more likely to have reduced quality of life, which includes cognitive development delays as well as language and motor skills [13]. Other health challenges for such children include frequent hospitalizations [2], poor nutritional status [12], irregular sleeping patterns [14], and higher risks of infant mortality [15, 16]. Because affected mothers are more likely to be unresponsive to the needs of their children [17], such children experience deprived emotional and social development and, consequently, compromised wellbeing for the baby. Affected children are also more likely to display behavioral problems [12, 18] and have a higher propensity towards violence in later years [19].

The risks associated with PND are a combination of biological, social, and economic, and they predispose women to PND. Women from lower socio-economic backgrounds are at a heightened risk for PND, with contributory factors such as financial difficulties, poverty, unemployment, insecure accommodation, and lower levels of education being more prevalent [11, 12, 20, 21]. Lack of access to social support and good interpersonal relationships results in women feeling lonely, isolated, and overwhelmed with the duties associated with motherhood. On the other hand, increased social support is reported to be a protective factor for PND [22]. Additionally, issues in intimate relationships like abuse [23], infidelity [21, 24], and conflicts with the partner significantly increase the prevalence of PND, with women who experienced physical abuse from their partners having a 6-fold increased risk of developing PND [25].

Other stressful life events, such as the ill health of the baby, the death of a loved one, or being a victim of a violent crime, may also negatively affect maternal mental health. Women who did not plan their pregnancies were at a two-fold higher risk of PND than those who did [6]. On the other hand, a higher prevalence of PND was identified among HIV-positive women in several communities [24, 26, 27]. Finding out about the HIV-positive status of the mother, along with related concerns about the health of the baby, also increases the risk of antenatal depression [26].

Despite all these consequences of PND that affect the mother, child, and family unit, maternal mental health is often neglected in developing countries [21]. As with other countries in Sub-Saharan Africa, Lesotho has limited resources and programs that are dedicated to maternal mental health; therefore, routine screening for post-natal depression in Primary Health Care facilities is not practiced [28, 29], and the burden of PND is not known. To the best of our knowledge, this will be among the first studies to screen for PND symptoms among women in Lesotho.

This study was about determining the prevalence of postnatal depression and associated factors among mothers attending Primary Health Care (PHC) in Maseru, Lesotho.

2. Methodology

2.1. Study Design

The Edinburgh Postnatal Depression Scale (EPDS) was used to collect data for this quantitative and cross-sectional study design.

2.2. Research Setting

The study was conducted in Maseru, which is the capital city of Lesotho, in eight private and public Primary Health Care clinics. These primary health care facilities offer a wide range of free health care services, including maternal and child health care services. The PHCs are under the auspices of the Maseru City Council, which is the local authority with an estimated 70,062 catchment population.

2.3. Population

The population consisted of postnatal mothers whose babies were between 12 to 14 weeks old, and such mothers were receiving postnatal services at the identified clinics.

2.4. Recruitment of Participants

The participants were recruited from the eight (8) primary healthcare facilities while they were waiting for postnatal services. The Sister-in-charge introduced the researcher or data collector to the patients, who addressed the mothers and explained the purpose and process of the study. An information brochure was also given, which included the ethics of the study as well as clarification that participation was not compulsory and that unwillingness to participate would not affect the service offered by the clinic. The data collector also provided opportunities for the potential participants to ask questions.

2.5. Sampling

The purposive sampling technique was used to select postpartum women to participate in the study from the eight PHC facilities, using the following criteria:

2.6. Inclusion Criteria

Mothers who were attending maternal and child health services on the day of data collection and who had delivered a live infant within 12 to 14 weeks at the time of the study were willing to participate in the study and were able to provide informed consent.

2.7. Exclusion Criteria

Women who do not meet any of the above-stated inclusion criteria, who have had previous psychiatric problems, and who could not provide informed consent for whatever reason.

2.8. Sample Size Determination

The Raosoft sample size calculator was used to calculate a minimum sample size of 345, and this was based on an estimated population of 3360 mothers who access postnatal services on a quarterly basis in the PHC facilities within Maseru city council, a 5% margin of error, a confidence level of 95%, and a distribution of 50%.

2.9. Data Collection Tool

The Edinburgh Postnatal Depression Scale (EPDS) was used to screen for PND symptoms [30, 31]. The tool has been confirmed to be reliable and valid internationally, including being used in African countries [23, 24, 32]. It consists of 10 questions with an ordinal scale of 0-3. The scores on the scale range from 0-30, with a higher score indicating the severity of PND. For this study, a cut-off point of 12 was used to identify symptoms of postnatal depression. The tool was translated from English to Sesotho, a language used in the study setting area. The data collection process was pre-tested on 15 post-natal mothers. A researcher-developed questionnaire was used to obtain demographic data on the participants.

2.10. Data Collection

The data were collected by the researcher and a trained research assistant between the May 2019 and July 2019. In each facility, the participants were recruited in the morning, where the sister-in-charge introduced the data collector to the women and provided the study objectives. After consenting to participate, participants were led to a private room at the facility where the researcher administered questionnaires.

2.11. Data Analysis

Raw data were captured in an Excel spreadsheet, cleaned, and exported to STATA version 14, a quantitative data analysis software, for analysis. Demographic data were descriptively analyzed and expressed as means, proportions, and percentages. EPNDS scores below 12 were categorized as not depressed, and those of 12 and above as depressed, with higher scores indicating increased severity of depression symptoms. The chi-square test of association was used to explore associations between sociodemographic variables and PND (p-value ≤ 0.05). Numerical variables such as age, birth weight, length of the baby, etc. were converted to categorical variables for ease of analysis. Factors that were significantly associated at the chi-square level during unilabiate analysis were included in the final logistic regression model.

2.12. Ethical Considerations

Permission to conduct the study was obtained from the Sefako Makgatho Health Sciences University Research and Ethics Committee (SMUREC/H/345/2018: PG), as well as the National Health Research Ethics Committee of Lesotho. Permission to conduct the study was obtained from the district office and the managers of primary health care clinics. Participation was voluntary, and written informed consent was obtained from each participant.

3. Results

3.1. Demographic Characteristics of the Women

The average maternal age of the women was 27 years. Most were married (n=310, 78.88%) and unemployed (n=254, 64.63%), with high school as their highest level of education (n=272, 69.21%). The majority (n=389, 98.98%) of the women had access to some form of social support. Table 1 outlines further details of the sociodemographic characteristics of the participants.

Table 1.
Socio-demographic characteristics of the participants.

Variable	Frequency (n)	Percentage (%)
Age=393		
Below 20 years	25	6.36
Between 20-35 years	344	87.53
Above 35 years	24	6.11
Marital status=393		
Single	75	19.08
Co-habiting	2	0.51
Married	310	78.88
Separated	6	1.53
Highest level of education=393		

Variable	Frequency (n)	Percentage (%)
Primary school	34	8.65
High school	272	69.21
Tertiary school	87	22.14
Employment status=393		
Employed	120	30.52
Self-employed	19	4.83
Unemployed	254	64.63
Number of occupants in the household (Under 18 years) =393		
Below 3	312	79.39
3-5 occupants	76	19.34
More than 5	5	1.27
Number of occupants in the household (Over 18 years) =393		
Below 3 occupants	148	37.66
3-5 occupants	202	51.40
More than 5 occupants	43	10.94
Access to social support: 393		
Yes	389	98.98
No	4	1.02
Experienced severe stressful event=393		
Yes	241	61.32
No	152	38.68

3.2. Health-Related Characteristics of the Women

Almost a third of the women (n=117, 29.77%) were HIV positive, and only a few (n=14, 3.56%) were unsure of their Human Immunodeficiency Virus (HIV) status. A slight majority (n=214, 54.45%) found out about their HIV status post-delivery, while others (n=90, 22.91%) found out during their antenatal visits. The majority (68.45%, n=269) of the women planned the pregnancy of the child they had just delivered. Only a few (n=34, 8.64 %) participants reported previous antenatal depression. Further health-related characteristics are outlined in Table 2:

Table 2.
Health-related characteristics of the women.

Variable	Frequency (n)	Percentage (%)
Health status of mother=393		
Good	293	74.55
Sometimes not well	97	24.68
Not well	2	0.51
Always sick	1	0.25
Parity=393		
Primiporous	228	58.02
Multiparous	165	41.98
Dead children=393		
Yes	16	4.07
No	377	95.93
Miscarriage history=393		
Present	19	4.83
Absent	374	95.17
Number of living children=393		
None	1	0.25
1 child	235	59.80
2-5 children	157	39.95
HIV status=392		
Negative	261	66.41
Positive	117	29.77
Unknown	14	3.56
Knowledge time of HIV status=393		
Before pregnancy	62	15.78
Antenatal	90	22.90
During delivery	14	3.56
Post-delivery	214	54.45
Not applicable	13	3.31

Variable	Frequency (n)	Percentage (%)
Smoking =392		
Never	390	99.24
Sometimes	2	0.51
Alcohol use=384		
Never	288	73.28
Sometimes	96	24.43
Planned pregnancy=391		
Yes	269	68.45
No	122	31.04
Delivery method=393		
Cesarean delivery	73	18.58
Normal vaginal delivery	320	81.42
Delivery course=391		
Regular	139	35.37
Problematic	1	0.25
Difficult	251	63.87
Duration of pregnancy=393		
Pre-term	3	0.76
Term	390	99.24
Previous antenatal depression= 393		
Yes	34	8.65
No	359	91.35

3.3. Socio-Demographic Variables of the Babies

The babies of the participants consisted of more boys (51.65%, n=203) than girls (48.35%, n=190), and most of the babies were in good health (98.22%, n=386) and exclusively breastfed (87.28%, n=343). The average weight of the babies was 5.35 kg, with the majority having a normal weight for their age (78.12%, n=307), and the majority having a normal length for their age (68.45%, n=269). Table 3 shows the socio-demographic variables of the babies.

Table 3.
Socio-demographic variables of the baby.

Variable	Frequency (n)	Percentage (%)
Gender of the baby=393		
Girl	190	48.35
Boy	203	51.65
Health of the baby=393		
Good	386	98.22
Sometimes not well	7	1.78
Feeding method=393		
Exclusive breastfeeding	343	87.28
Formula	33	8.40
Mixed method	17	4.33
Birth weight of the baby=393		
Less than 2.5 kg	48	12.21
Between 2.5-3.5 kg	248	63.10
Above 3.5 kg	97	24.68
Current weight of the baby=393		
Less than 3.5 kg	48	12.21
Between 3.5-4.5 kg	56	14.25
Between 4.5-5.5 kg	124	31.55
Above 5.5 kg	165	41.98
Baby weight for age=392		
Severely underweight	4	1.02
Underweight	7	1.78
Normal	307	78.12
Overweight	74	18.83
Length of the baby=393		
Less than 50 cm	57	14.50
Between 50-55 cm	123	31.30
Above 55 cm	213	54.20

Variable	Frequency (n)	Percentage (%)
Length for age=392		
Severely stunted	21	5.34
Stunted	28	7.12
Normal	269	68.45
Tall for age	74	18.83
Weight for length of the baby=392		
Severely wasted	9	2.29
Wasted	8	2.04
Severely stunted	12	3.05
Normal	270	68.70
Overweight	44	11.20
Obese	49	12.47

3.4. Social Characteristics of the Partners

A majority of the participant's partners were employed (74.87%, n=294) and provided financial support (86.26%, n=339). Participants reported high levels of relationship satisfaction (89.31%, n=351) as well as high levels of general support (91.35%, n=359) from their partners. Table 4 provides further social characteristics of the partners of the participants.

Table 4.
Social characteristics of the partner.

Variable	Frequency (n)	Percentage (%)
Partner's level of education=391		
No formal education	6	1.53
Primary school	10	2.54
High school	320	81.42
Tertiary	25	6.36
Unknown	30	7.63
Employment status of the partner=393		
Employed	294	74.81
Self-employed	74	18.83
Unemployed	19	4.83
Don't know	4	1.02
Baby welcomed by partner		
Yes	369	93.89
No	24	6.11
Partner's use of alcohol =393		
Yes	227	57.76
No	166	42.24
Partner's preferred gender for the baby		
Yes	368	93.64
No	25	6.36
Partner IPV=393		
Yes	27	6.87
No	366	93.13
Partner has other sexual partners=393		
Yes	55	13.99
No	338	86.01
Relationship satisfaction with partner=393		
Yes	351	89.31
No	42	10.69
Partner financial Support=393		
Yes	339	86.26
No	54	13.74
Partner general support=393		
Yes	359	91.35
No	34	8.65

3.5. Prevalence of Post-Natal Depression

The prevalence of post-natal depression was 43% in the sample, which is shown in Figure 1.

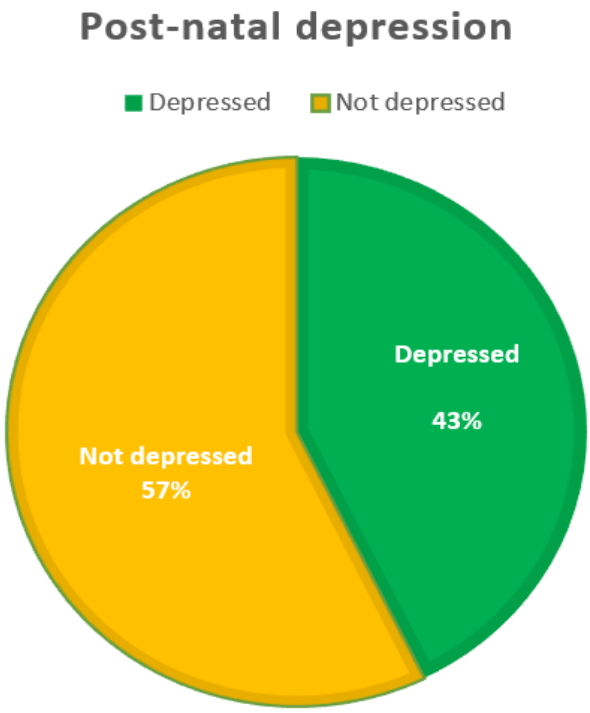

Figure 1.
Prevalence of post-natal depression.

3.6. Tests of the Association of Socio-Demographic Characteristics

There were 9 factors that were significantly associated with post-natal depression symptoms. Three of these factors were directly related to social support received from the partner (p=0.002), friends (0.024), and extended family (0.005). Financial factors such as receiving financial support from the partner (0.000) and experiencing a financial crisis (0.013) were also significantly associated. The knowledge time of HIV status (0.004) was an important factor as well. All the other factors are listed in Table 5:

Table 5.
Factors associated with post-natal depression.

Factors	Frequency (%)	Depressed (%)	Not depressed (%)	Chi^2	p-value
Knowledge time of HIV status				15.554	0.004
Before pregnancy	62 (15.78)	17 (10.12)	45(20.00)		
Antenatal	90 (22.90)	52 (30.95)	38(16.89)		
During pregnancy	14 (3.56)	7 (4.17)	7(3.11)		
Post-delivery	214 (54.45)	88 (52.38)	126(56.00)		
Relationship satisfaction with partner				8.913	0.003
Yes	351 (89.31)	141 (83.93)	210 (93.33)		
No	42 (10.69)	27 (16.07)	15 (6.67)		
Financial support from partner				14.634	0.000
Yes	339 (86.26)	132 (78.57)	207(92.00)		
No	54 (13.74)	36 (21.43)	18 (8.00)		
General support from partner				9.428	0.002
Yes	359 (91.35)	145 (86.31)	214 (95.11)		
No	34 (8.65)	23 (13.69)	11 (4.89)		
Social support: Extended family				7.715	0.005
Yes	18 (4.58)	2 (1.19)	16 (7.11)		
No	375 (95.42)	166 (98.81)	209 (92.89)		
Social support: Friend				5.092	0.024
Yes	21 (5.34)	4 (2.38)	17 (7.56)		
No	372 (94.66)	164 (97.62)	208 (92.44)		
Stressful event: Financial crisis				6.122	0.013
Yes	157 (39.95)	79 (47.02)	78 (34.67)		
No	236 (60.05)	89 (52.98)	147 (65.33)		
Stressful event: Relationship problems				11.329	0.001
Yes	38 (9.67)	26 (15.48)	12 (5.33)		
No	355 (90.33)	142 (84.52)	213 (94.67)		

Factors	Frequency (%)	Depressed (%)	Not depressed (%)	Chi^2	p-value
Length of the baby (cm)				6.827	0.033
Less than 50 cm	57 (14.50)	18 (10.71)	39 (17.33)		
Between 50-55 cm	123 (31.30)	63 (37.50)	60 (26.67)		
Above 55 cm	213 (54.20)	87 (51.79)	126 (56.00)		

3.7. Multivariate Logistic Regression Analysis of the Factors Associated with PND

There were four main factors that remained significantly associated with the symptoms of post-natal depression. Three of these factors had to do with the partner's financial support as well as the support from the partner's extended family and friends. The experience of a stressful event, specifically relationship problems, was the last factor that remained significantly associated with post-natal depression symptoms. Although the height of the baby was significantly associated with PND at the univariate level, it was not significant at the multivariate level. Table 6 illustrates the results of the final logistic regression model.

Table 6.
Logistic regression model for post-natal depression.

Factors	Coef.	Std. err.	P>|z|	[95% conf. interval]
Knowledge time of HIV status	-0.037	0.087	0.672	-0.208 0.134
Relationship satisfactions with partner	0.786	0.799	0.325	-0.779 2.351
Financial support from partner	-1.135	0.588	0.054	-2.289 0.017
General support from partner	-0.595	0.545	0.274	-1.664 0.472
Social support: Extended family	-2.137	0.799	0.007	-3.704 -0.571
Social support: Friend	-1.182	0.584	0.043	-2.327 -0.037
Stressful event: Financial crisis	0.545	0.212	0.013	0.115 0.976
Stressful event: Relationship problems	0.652	0.647	0.313	-0.615 1.921
Height of the baby	0.020	0.149	0.891	-0.272- 0 .313

4. Discussion

The socio-demographic characteristics of the women in this sample were similar to those reported by other scholars in similar settings, as most women were married [6, 8], unemployed [24, 26], with secondary school as their highest educational attainment, and the majority financially dependent on their partners. The average maternal age of 27 years was similar to the maternal age of Ethiopian women [8]. A third of the mothers were HIV positive (n=117, 29.77%), which is similar to the HIV prevalence of 30% amongst women in the general population of Lesotho.

The results of the current study establish a high PND prevalence of 43% and confirm previous reports that developing countries have high PND rates, compared to developed countries, which report rates between 13 and 15% [33], which indicates the seriousness of PND in Lesotho. However, the current prevalence is similar to the prevalence of 43% in Uganda [34] and slightly lower than the rate of 44% in Burkina Faso [35]. Other studies in Eswatini [36] and South Africa [37] have reported higher prevalence rates of 50.3% and 57.14%, respectively. These differences may be attributable to differences between rural and urban settings, as well as the use of different screening tools.

Although other studies reported associations between a younger age [38], being unemployed [39, 40], having low levels of education [41], and higher risks of PND, this current study found no such associations. These results are comparable with other studies that reported no association between age [42, 43], educational background [44], and PND. Social support, specifically support from the partner, extended family, and friends, was found to be a protective factor against PND.

Women who had access to social support were less likely to test positive for PND symptoms, which was similar to other studies [22, 25], which highlights the essential role in alleviating some of the maternal-related responsibilities. In the African culture, new mothers receive support from their own mothers at the time of giving birth [45], which capacitates the new mother with necessary coping skills [46], which alleviate stress and lower the risk of PND [20]. Although Lesotho has one of the highest HIV prevalence rates globally [47, 48], this study did not find a significant association between HIV-positive status and PND.

Similar to other studies, relationship factors are strongly associated with PND [21, 23, 24]. Women who reported dissatisfaction within their romantic relationships, as well as those experiencing high levels of stress due to relationship problems, were more likely to have PND. However, in this study, infidelity and IPV were not significantly associated with PND, which contradicts findings by other scholars [20, 24, 25], who reported associations with these factors. The reasons for these differences are not clear, and further inquiry is required.

Clinical and obstetric-related factors such as whether the pregnancy was planned or not, pregnancy, delivery method, maternal health status, parity, and history of miscarriages were not correlated with PND. This may be attributable to the specific characteristics of women in this particular sample, as a majority of women were in good health (74.55%), had planned their current pregnancy (68.45%), and the general health of their babies was good (98.22%). An Ethiopian study reported that women who attended antenatal services were 4 times less likely to be depressed, while women who attended post-natal services were 2 times less likely to be depressed due to the support provided by healthcare workers [6], which may explain the associated health status of the mother. Similar to other studies [2, 49], sleeping problems, anxiety, and coping difficulties are among the most commonly reported symptoms in this sample.

The high prevalence of PND in the current study suggests a significant burden of an undetected mental health condition among mothers in Maseru. To the best of our knowledge, this may be the first study over a long period to screen for PND in Lesotho. The results, supported by literature from other African countries, suggest that other areas within Lesotho may also be greatly affected, thus indicating a need for further research, especially in rural areas, where the burden might be higher due to worse socio-economic issues. Lesotho is largely rural, with high rates of unemployment as well as food and financial insecurity [11, 50]. Additionally, financial factors, such as a lack of financial support from a partner and having experienced a financial crisis within the previous six months, were significantly associated with PND symptoms in both the univariate and multivariate analyses. A different study conducted in Lesotho also found a significant association between depression among caregiver and poverty-related factors such as food insecurity, Marlow, et al. [11], which supports previous findings and conclusions that low socio-economic status is a risk factor for depression [51].

5. Conclusion

The high prevalence of PND symptoms among this sample of women highlights the importance of social factors in influencing maternal mental health. For the most part, non- and under-detection of PND among mothers occurs because of a lack of routine PND screening at PHC facilities, and policy changes to implement routine screening in PHC facilities in Lesotho should be considered, which will improve maternal and child health outcomes.

6. Recommendations

It is recommended that routine screening for PND be integrated into Lesotho's maternal healthcare services, and this requires policy change. Early diagnosis and treatment of affected women will limit complications and thus contribute towards improved maternal and child well-being in the country. It is also recommended that further studies on the burden of PND in Lesotho be conducted, with a focus on rural areas, where the majority of Basothos live.

7. Limitations

The urban study setting makes it difficult to generalize the findings to the rest of the population in Lesotho which is predominately rural. The cross-sectional nature of the study could not allow for the assessment of the progression or development of PND because data was collected at one point in time. The purposive sampling design could have introduced bias, but this bias was reduced by increasing the sample size from the 345 minimum required to the total sample size of 393.

References

[1] P. Shidhaye and P. Giri, "Maternal depression: A hidden burden in developing countries," *Annals of Medical and Health Sciences Research*, vol. 4, no. 4, pp. 463-465, 2014. https://doi.org/10.4103/2141-9248.139268

[2] J. Slomian, G. Honvo, P. Emonts, J.-Y. Reginster, and O. Bruyère, "Consequences of maternal postpartum depression: A systematic review of maternal and infant outcomes," *Women's Health*, vol. 15, p. 1745506519844044, 2019. https://doi.org/10.1177/1745506519844044

[3] A. F. Dadi, T. Y. Akalu, A. G. Baraki, and H. F. Wolde, "Epidemiology of postnatal depression and its associated factors in Africa: A systematic review and meta-analysis," *PloS One*, vol. 15, no. 4, p. e0231940, 2020. https://doi.org/10.1371/journal.pone.0231940

[4] M. Nielsen-Scott, G. Fellmeth, C. Opondo, and F. Alderdice, "Prevalence of perinatal anxiety in low-and middle-income countries: A systematic review and meta-analysis," *Journal of Affective Disorders*, vol. 306, pp. 71-79, 2022. https://doi.org/10.1016/j.jad.2022.03.032

[5] Z. Wang *et al.*, "Mapping global prevalence of depression among postpartum women," *Translational Psychiatry*, vol. 11, no. 1, pp. 1-13, 2021.

[6] M. Asaye, H. Muche, and E. Zelalem, "Prevalence and predictors of postpartum depression: Northwest Ethiopia," *Psychiatry Journal*, vol. 2020, pp. 1-9, 2020. https://doi.org/10.1155/2020/9565678

[7] I. Torjesen, "New mothers are most likely to be depressed four years after giving birth," *Biomedical Journal*, vol. 348, p. g3446, 2014.

[8] R. Anokye, E. Acheampong, A. Budu-Ainooson, E. I. Obeng, and A. G. Akwasi, "Prevalence of postpartum depression and interventions utilized for its management," *Annals of General Psychiatry*, vol. 17, no. 1, pp. 1-8, 2018. https://doi.org/10.1186/s12991-018-0188-0

[9] C. Atuhaire *et al.*, "Prevalence of postpartum depression and associated factors among women in Mbarara and Rwampara districts of south-western Uganda," *BMC Pregnancy and Childbirth*, vol. 21, no. 1, pp. 1-12, 2021. https://doi.org/10.1186/s12884-021-03967-3

[10] S. S. Leung *et al.*, "Outcome of a postnatal depression screening programme using the Edinburgh Postnatal depression scale: A randomized controlled trial," *Journal of Public Health*, vol. 33, no. 2, pp. 292-301, 2011. https://doi.org/10.1093/pubmed/fdq075

[11] M. Marlow *et al.*, "Depression, anxiety, and psychological distress among Caregivers of young children in rural Lesotho: Associations with food insecurity, household death and parenting stress," *SSM-Mental Health*, vol. 2, p. 100167, 2022. https://doi.org/10.1016/j.ssmmh.2022.100167

[12] E. J. Rotheram-Fuller *et al.*, "Maternal patterns of antenatal and postnatal depressed mood and the impact on child health at 3-years postpartum," *Journal of Consulting and Clinical Psychology*, vol. 86, no. 3, pp. 218-230, 2018. https://doi.org/10.1037/ccp0000281

[13] N. O'Leary, C. Jairaj, E. J. Molloy, F. M. McAuliffe, E. Nixon, and V. O'Keane, "Antenatal depression and the impact on infant cognitive, language and motor development at six and twelve months postpartum," *Early Human Development*, vol. 134, pp. 41-46, 2019. https://doi.org/10.1016/j.earlhumdev.2019.05.021

[14] A. Oyetunji and P. Chandra, "Postpartum stress and infant outcome: A review of current literature," *Psychiatry Research*, vol. 284, p. 112769, 2020. https://doi.org/10.1016/j.psychres.2020.112769

[15] Y.-H. Chen, S.-Y. Tsai, and H.-C. Lin, "Increased mortality risk among offspring of mothers with postnatal depression: A nationwide population-based study in Taiwan," *Psychological Medicine,* vol. 41, no. 11, pp. 2287-2296, 2011. https://doi.org/10.1017/s0033291711000584

[16] B. Weobong *et al.*, "Association between probable postnatal depression and increased infant mortality and morbidity: Findings from the DON population-based cohort study in rural Ghana," *BMJ Open,* vol. 5, no. 8, p. e006509, 2015. https://doi.org/10.1136/bmjopen-2014-006509

[17] R. H. Bind *et al.*, "Mother–infant interaction in women with depression in pregnancy and in women with a history of depression: The psychiatry research and motherhood–depression (PRAM-D) study," *BJPsych Open,* vol. 7, no. 3, p. e100, 2021. https://doi.org/10.1192/bjo.2021.52

[18] R. Cents *et al.*, "Trajectories of maternal depressive symptoms predict child problem behaviour: The generation R study," *Psychological Medicine,* vol. 43, no. 1, pp. 13-25, 2013. https://doi.org/10.1017/s0033291712000657

[19] K. Hendricks and J. Liu, "Maternal depression and childhood aggression: Literature review," *MCN. The American journal of Maternal Child Nursing,* vol. 37, no. 4, pp. 253-261, 2012. https://doi.org/10.1097/nmc.0b013e3182482c5e

[20] T. Azale, A. Fekadu, and C. Hanlon, "Postpartum depressive symptoms in the context of high social adversity and reproductive health threats: A population-based study," *International Journal of Mental Health Systems,* vol. 12, no. 1, pp. 1-10, 2018. https://doi.org/10.1186/s13033-018-0219-x

[21] T. Kathree, O. M. Selohilwe, A. Bhana, and I. Petersen, "Perceptions of postnatal depression and health care needs in a South African sample: The "mental" in maternal health care," *BMC Women's Health,* vol. 14, no. 1, pp. 1-11, 2014. https://doi.org/10.1186/s12905-014-0140-7

[22] N. C. M. C. Watts, P. Liamputtong, and C. Mcmichael, "Early motherhood: A qualitative study exploring the experiences of African Australian teenage mothers in greater Melbourne, Australia," *BMC Public Health,* vol. 15, no. 1, pp. 1-11, 2015. https://doi.org/10.1186/s12889-015-2215-2

[23] D. Govender, S. Naidoo, and M. Taylor, "Antenatal and postpartum depression: Prevalence and associated risk factors among adolescents' in KwaZulu-Natal, South Africa," *Depression Research and Treatment,* vol. 2020, pp. 1-12, 2020. https://doi.org/10.1155/2020/5364521

[24] K. E. Mokwena and N. L. Mbatha, "Social and demographic factors associated with postnatal depression symptoms among HIV-positive women in primary healthcare facilities, South Africa," *Healthcare,* vol. 9, no. 1, p. 65, 2021.

[25] P. Modjadji and K. Mokwena, "Postnatal depression screening among postpartum women attending postnatal care at selected community health centres situated in the Nkangala district of south africa," *Open Public Health Journal,* vol. 13, no. 1, pp. 696-704, 2020. https://doi.org/10.2174/1874944502013010696

[26] I. Mokhele, C. Nattey, N. Jinga, C. Mongwenyana, M. P. Fox, and D. Onoya, "Prevalence and predictors of postpartum depression by HIV status and timing of HIV diagnosis in Gauteng, South Africa," *PLoS One,* vol. 14, no. 4, p. e0214849, 2019. https://doi.org/10.1371/journal.pone.0214849

[27] Q.-Y. Zhu, D.-S. Huang, J.-D. Lv, P. Guan, and X.-H. Bai, "Prevalence of perinatal depression among HIV-positive women: A systematic review and meta-analysis," *BMC Psychiatry,* vol. 19, no. 1, pp. 1-12, 2019. https://doi.org/10.1186/s12888-019-2321-2

[28] World Health Organization, "Mental health Atlas: 2011," Retrieved: https://www.who.int/publications/i/item/9799241564359. 2011.

[29] A. Larsen *et al.*, "Is there an optimal screening tool for identifying perinatal depression within clinical settings of Sub-Saharan Africa?," *SSM-Mental Health,* vol. 1, p. 100015, 2021. https://doi.org/10.1016/j.ssmmh.2021.100015

[30] K. A. Ertel, K. C. Koenen, J. W. Rich-Edwards, and M. W. Gillman, "Antenatal and postpartum depressive symptoms are differentially associated with early childhood weight and adiposity," *Paediatric and Perinatal Epidemiology,* vol. 24, no. 2, pp. 179-189, 2010. https://doi.org/10.1111/j.1365-3016.2010.01098.x

[31] H. Petursdottir Maack *et al.*, "Maternal body mass index moderates antenatal depression effects on infant birthweight," *Scientific Reports,* vol. 9, no. 1, p. 6213, 2019. https://doi.org/10.1038/s41598-019-42360-1

[32] D. Chibanda *et al.*, "Validation of the Edinburgh Postnatal depression scale among women in a high HIV prevalence area in urban Zimbabwe," *Archives of Women's Mental Health,* vol. 13, no. 3, pp. 201-206, 2010. https://doi.org/10.1007/s00737-009-0073-6

[33] M. W. O'hara and J. E. McCabe, "Postpartum depression: Current status and future directions," *Annual Review of Clinical Psychology,* vol. 9, no. 1, pp. 379-407, 2013. https://doi.org/10.1146/annurev-clinpsy-050212-185612

[34] T. A. Kakyo, J. K. Muliira, S. N. Mbalinda, I. B. Kizza, and R. S. Muliira, "Factors associated with depressive symptoms among postpartum mothers in a rural district in Uganda," *Midwifery,* vol. 28, no. 3, pp. 374-379, 2012. https://doi.org/10.1016/j.midw.2011.05.001

[35] C. Atuhaire, L. Brennaman, S. N. Cumber, G. Z. Rukundo, and G. Nambozi, "The magnitude of postpartum depression among mothers in Africa: A literature review," *Pan African Medical Journal,* vol. 37, no. 1, 2020. https://doi.org/10.11604/pamj.2020.37.89.23572

[36] E. L. Stellenberg and J. M. Abrahams, "Prevalence of and factors influencing postnatal depression in a rural community in South Africa," *African Journal of Primary Health Care and Family Medicine,* vol. 7, no. 1, pp. 1-8, 2015. https://doi.org/10.4102/phcfm.v7i1.874

[37] K. Mokwena and I. Masike, "The need for universal screening for postnatal depression in South Africa: Confirmation from a sub-district in Pretoria, South Africa," *International Journal of Environmental Research and Public Health,* vol. 17, no. 19, p. 6980, 2020. https://doi.org/10.3390/ijerph17196980

[38] E. R. Swift, M. Pierce, H. Hope, C. S. Osam, and K. M. Abel, "Young women are the most vulnerable to postpartum mental illness: A retrospective cohort study in UK primary care," *Journal of Affective Disorders,* vol. 277, pp. 218-224, 2020. https://doi.org/10.1016/j.jad.2020.08.016

[39] D. Gjerdingen, P. McGovern, L. Attanasio, P. J. Johnson, and K. B. Kozhimannil, "Maternal depressive symptoms, employment, and social support," *The Journal of the American Board of Family Medicine,* vol. 27, no. 1, pp. 87-96, 2014. https://doi.org/10.3122/jabfm.2014.01.130126

[40] B. A. Lewis, L. Billing, K. Schuver, D. Gjerdingen, M. Avery, and B. H. Marcus, "The relationship between employment status and depression symptomatology among women at risk for postpartum depression," *Women's Health*, vol. 13, no. 1, pp. 3-9, 2017. https://doi.org/10.1177/1745505717708475

[41] K. Matsumura, K. Hamazaki, A. Tsuchida, H. Kasamatsu, and H. Inadera, "Education level and risk of postpartum depression: Results from the Japan environment and children's study (JECS)," *BMC Psychiatry*, vol. 19, no. 1, pp. 1-11, 2019. https://doi.org/10.1186/s12888-019-2401-3

[42] J. M. Chinawa *et al.*, "Postpartum depression among mothers as seen in hospitals in Enugu, South-East Nigeria: An undocumented issue," *Pan African Medical Journal*, vol. 23, p. 180, 2016. https://doi.org/10.11604/pamj.2016.23.180.8244

[43] D. Sulyman, K. Ayanda, L. Dattijo, and B. Aminu, "Postnatal depression and its associated factors among Northeastern Nigerian women," *Annals of Tropical Medicine and Public Health*, vol. 9, no. 3, pp. 184-90, 2016. https://doi.org/10.4103/1755-6783.179099

[44] J. E. Anding, B. Röhrle, M. Grieshop, B. Schücking, and H. Christiansen, "Couple comorbidity and correlates of postnatal depressive symptoms in mothers and fathers in the first two weeks following delivery," *Journal of Affective Disorders*, vol. 190, pp. 300-309, 2016. https://doi.org/10.1016/j.jad.2015.10.033

[45] K. Clouse *et al.*, "'I will leave the baby with my mother': Long-distance travel and follow-up care among HIV-positive pregnant and postpartum women in South Africa," *Journal of the International AIDS Society*, vol. 21, p. e25121, 2018. https://doi.org/10.1002/jia2.25121

[46] R. Negron, A. Martin, M. Almog, A. Balbierz, and E. A. Howell, "Social support during the postpartum period: Mothers' views on needs, expectations, and mobilization of support," *Maternal and child Health Journal*, vol. 17, pp. 616-623, 2013. https://doi.org/10.1007/s10995-012-1037-4

[47] J. A. Belle and N. N. Gamedze, "Behavioral factors contributing to the transmission of HIV and AIDS amongst young women of Mbabane in Swaziland," *African Health Sciences*, vol. 19, no. 3, pp. 2302-2311, 2019. https://doi.org/10.4314/ahs.v19i3.2

[48] R. Machekano *et al.*, "HIV incidence among pregnant and postpartum women in a high prevalence setting," *PLoS One*, vol. 13, no. 12, p. e0209782, 2018. https://doi.org/10.1371/journal.pone.0209782

[49] K. Howard, J. M. Maples, and R. A. Tinius, "Modifiable maternal factors and their relationship to postpartum depression," *International Journal of Environmental Research and Public Health*, vol. 19, no. 19, p. 12393, 2022. https://doi.org/10.3390/ijerph191912393

[50] World Bank, *Lesotho poverty assessment: Progress and challenges in reducing poverty*. Washington DC: World Bank, 2019.

[51] A. F. Dadi, E. R. Miller, and L. Mwanri, "Postnatal depression and its association with adverse infant health outcomes in low- and middle-income countries: A systematic review and meta-analysis," *BMC Pregnancy and Childbirth*, vol. 20, no. 1, pp. 1-15, 2020. https://doi.org/10.1186/s12884-020-03092-7