Magnitude and Factors Associated with Depressive Symptoms among Post-Partum Mothers Visiting Rural health center in Ethiopia, A Cross Sectional Study

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Abstract

Background

Due to their propensity for pregnancy, childrearing, and caring for others, women are twice more likely than males to develop depression during their lifetime. Social stresses like poverty, intimate partner abuse, a history of miscarriage, and unwanted pregnancy are risk factors for postpartum depression, and these factors have a negative impact on maternal health. The mother and her children may suffer long-term negative effects if postpartum depression is left untreated. This research aims to address the gap in studies in Oromia region and contribute to building strong and a more representative evidence for postpartum depression in Ethiopia.

Methods

The study is a health facility-based cross-sectional study, among postnatal mothers visiting Batu health center. Descriptive and analytical cross-sectional study design was used among postnatal women who have given birth within the past 12 months. The Edinburgh postpartum depression scale was used to assess postpartum depression. Social support was assessed using the maternal social support scale. Chi-square test analysis was used to determine the association of post-partum depressive symptoms with socio-demographic, obstetric and psychosocial factors.

Results

Based on the cut-off points of Edinburgh Postnatal Depression Scale (≥11), 24.6 percent of the total respondents had post-partum depression whereas 75.4 percent did not have depressive symptoms. Among the mothers who had postpartum depression, majority (85.4%) had not even heard about the disease before. Among those mothers who had postpartum depression, 25% had low social support. Significant association was found between abortion history, unplanned pregnancy, history of mental illness, family history of mental illness, social support and PPD.

Conclusions

Despite the high magnitude of postpartum depression, measures to help depressed mothers are not brought to action. This highlights the need to advocate for postpartum depression services. Although the mothers with postpartum depression have made it to the health center, our study showed that they go back unnoticed. Postpartum depression screening is a simple but profound step that can be implemented. Moreover, antenatal care visits can be used as an opportunity to give health education on postpartum depression.

1. Background

Excitation, delight, dread, and other strong emotions can all be sparked by the birth of a child(1). Due to their propensity for pregnancy, childrearing, and caring for others, women are twice more likely than males to develop depression during their lifetime(2). Postpartum depression is a severe and pervasive type of depression that some new mothers endure. Because it can begin during pregnancy and persist after childbirth, it is sometimes referred to as “Peri-partum depression”. The change in progesterone levels is mostly responsible for these emotions, however, is not likely to be the sole contributor(3). Symptoms of postpartum depression can include strong mood swings or a depressed mood, crying excessively, having a hard time bonding with your child, withdrawing from relatives and friends, sleep disturbances, excessive fatigue or lack of energy, loss of enjoyment from past activities, severe irritation and fury apprehension that you are a bad mother.(1). In the world, 10–20% of mothers experience depression symptoms after giving birth(4). In developed countries, the prevalence of PPD is thought to be around 10%(5) and about 20% in developing nations(6). A systematic review that included 19 studies from all over Africa showed that prevalence of postpartum depression was 16.84%(7).
Social stresses like poverty, intimate partner abuse, a history of miscarriage, and unwanted pregnancy are risk factors for postpartum depression, and these factors have a negative impact on maternal health(8). The mother and her children may suffer long-term negative effects if postpartum depression is left untreated. Chronic depression in pregnant women may be a factor in their interpersonal, behavioral, cognitive, and emotional issues(9). Postnatal depression places a heavy strain on spouses and members of the immediate family, limiting social and leisure activities and leading to financial issues for the family(10–12). Compared to women without postnatal depression, women with postnatal depression are more likely to have unhealthy lifestyles, which include poor nutrition and sleep habits(13–15). Mothers suffering from postpartum depression may have a harder time interpreting and reacting to the cues sent by the baby(16). The effect of postpartum depression is not limited to the mothers. Children who are taken care of by mothers who suffer from postpartum depression are also victims. Underweight, stunting, and lowered mental development have all been linked to postnatal depression(17). Breastfeeding cessation occurs earlier in depressed mothers than in non-depressed moms(18–20).

PPD is frequently disregarded in developing nations, particularly Ethiopia, where there is no postnatal follow-up screening and no referral of PPD cases for adequate mental health services. Around 80%, of postpartal women with psychological and neurological issues in Ethiopia and other developing nations lacked access to necessary medical care(21). This study aims to assess the magnitude and factions associated with postpartum depression among mothers visiting Batu Health Center. Although studies have been done in different part of Ethiopia, very few are done in Oromia Region. This research aims to address the gap and contribute to building strong and a more representative evidence for postpartum depression in Ethiopia. In addition, it aims to highlight on the accessibility of care for mothers with postpartum depression who are visiting Batu Health center.

2. Methodology

Study area and Period

The study is a health facility-based cross-sectional study, among postnatal mothers visiting Batu health center. Government owned health facilities in Batu include 1 hospital and 2 health centers. The catchment population of the health center is 41,381. The treating team includes 7 health officers, 2 midwives, 7 nurses, 1 lab technician and 1 pharmacist. The total number of patients that were examined at Batu health center during the last year was 18,420.

The study was conducted from July 11, 2022 until August 11, 2022 in Batu, Adami Tulu. Adami Tulu district is one of the districts in East Shewa Zone, Oromia regional state of Ethiopia.

Study Design

Descriptive and analytical cross-sectional study design was used among postnatal women who have given birth within 12 months from the date of data collection.

Inclusion Criteria

All mothers who gave birth at least 2 weeks before the interview and who are residents for at least 6 months in the study area

Exclusion Criteria

- Mothers who gave birth within 2 weeks before the data collection period.
- Mothers who gave birth 12 months and above before the data collection period.
- Mothers who were sick and were not able to respond to the questions asked
Sample Size and Sampling Technique

Considering prevalence rate to be an average of 22% by Duko B. et al, 2020 (22) sample size was calculated to be 264.

\[
N_0 = \frac{(1.96)^2 \times 0.22 \times 0.78}{(0.05)^2}
\]

\[N_0 = 263.68(264)\]

Batu health center vaccination center (EPI) receives an average of 25 mothers per day. The study period was 30 days and therefore an average of 750 mothers would visit the health center per month. Since this number is less than 10,000, we can use correction factor and the sample size was 195.

\[n_f = \frac{n_0}{1 + \frac{n_0}{N}}\]

\[n_f = \frac{264}{1 + \frac{264}{750}}\]

\[n_f = 195\]

Adding 10% non-response rate, the final sample size was 215. Simple random sampling was used as the sampling procedure. Among the mothers who were in queue for vaccination and other services, and who fulfilled the inclusion criteria, participants were randomly selected and interviewed.

Data collection tool and procedures
Data were collected using a structured questionnaire that was administered by interviewers. Six fifth year medical students of Tikur Anbessa Specialized Hospital collected the data through face-to-face individual interview with the mothers using Google forms. The Edinburgh postpartum depression scale (EPDS) was used to assess postpartum depression. The EPDS is a 10-item self-report measure that is intended to screen for PPD. It is based on a one-week recall. The EPDS was validated as a screening tool to identify postnatal depression symptoms in Ethiopia and its sensitivity was found to be 78.9% and its specificity to be 75.3%(21, 22). Social support was assessed using the maternal social support scale (MSSS). The Maternity Social Support Scale (MSSS) was developed by Webster and colleagues(25). A maximum score of 30 was obtainable, with each item measuring a Likert scale on a five-point scale.

Data Processing and analysis

The data was imported from Google forms, cleaned and checked for completeness, accuracy and missing data. It was then exported to SPSS Version 20 for analysis. Chi-square test analysis was used to determine the association of post-partum depressive symptoms with socio-demographic, obstetric and psychosocial factors.

Operational Definition

Postpartum – is defined the postpartum period as the first 12 months after birth(26).

Postpartum depression - form of major depression that begins within 2 weeks after delivery(3).

Low social support - Score of below 18 on the maternal social support scale

Medium social support - Score of 18 - 23 on the maternal social support scale

High social support – Score of 24 - 30 on the maternal social support scale

Variables

Dependent Variable

Postpartum Depression

Independent Variables

Socio-demographic factors, Obstetric related factors, Social support, Psychosocial factors, Substance abuse and availability of postnatal care services.

3. Result

Socio-Demographic Characteristics of post-partum Mothers

With 90.6% response rate, a total of 195 post-partum mothers were part of our study, Majority (51.3%) were between the ages of 25 and 32. 68.7% of participants were housewives, while others were merchants, farmers, daily laborers, government employees and others. About 98.5% were married.

Obstetric History of post-partum mothers

Half (51.3%) of the participants had been pregnant once or twice. Majority (82.6%) of the respondents did not have abortion history and 16.4% had history of at least one abortion. 87.7 % of the respondents said that their recent pregnancy was planned. 90.8% of the participants had ANC visits during their pregnancy. Among the mothers that had ANC visits, 88.2% were not advised about PPD.
91.8% of the respondents had vaginal delivery (both spontaneous and assisted vaginal deliveries), while 8.2% had cesarean section. Majority (91.8%) had delivery without complications. About 93.3% of the study participants had no impending PNC visit.

**Psychosocial history of the post-partum mothers**

Among the respondents, 73.8% of them had no infant health problems. 79% of the mothers had children with wanted sex. 97.9% of the participants do not have history of mental illness and 89.7% of the mothers had no family history of mental illness. While inquired about their drinking habit, 89.2% reported that they have never used alcohol before or during pregnancy.

**Magnitude of Post-Partum Depression**

Based on the cut-off points of Edinburgh Postnatal Depression Scale (EPDS) (≥11), 24.6 percent of the total respondents had post-partum depression whereas 75.4 percent did not have depressive symptoms. Up-to-date recommends using a cutoff score of 11, which seems to maximize test performance in terms of both sensitivity and specificity and typically good to outstanding test performance(26). Among the mothers who had postpartum depression (48), 18(24.62%) of them had thoughts of self-harm.

Among the mothers who had participated in our study, 77.4% had never heard of what postpartum depression is. Among the mothers who had postpartum depression, majority (85.4%) had not even heard about the disease before. Figure 1 depicts that in both groups of mothers, the higher proportions had not heard of the disease before.

**Social Support**

Maternal Social support scale was used to determine the availability of social support. Among the participants of the study, 9.2% had low social support. Among those mothers who had postpartum depression, 25% had low social support.

From the study participants who had postpartum depression, 18.75% reported that they don't ask for help from their family in times of need, 8.3% don't agree that their family friend network is good and 8.3% weren't completely assured that they can completely rely on their spouse. 54.34% have conflicts with their spouse, 14.9% feel controlled by their family and 18.75% don't feel loved and accepted by their family.

**Association between Variables and Postpartum Depression**

Cross tabulation was made between postpartum depression and independent variables. Pearson Chi-squared analysis was used to check for the prevalence of association between the variables and significant association was declared if the P-Value is <0.05. Strength of association for factors that showed association was measured using contingency coefficients. The values of contingency coefficient range from 0 to 1, with a value near to 1 suggesting a strong relationship between the variables.

**Association between socio-demographic characteristics and postpartum depression**

There was no association between Post-Partum Depression and Age, Occupation and Marital Status. The respective p-values for the variables were greater than 0.05 as portrayed on table 1.

Table 1: Association between demographic characteristics and Post-Partum Depression
Association between Obstetric factors and postpartum depression

Significant association was found between abortion history and post-partum depression (p=0.005). The contingency coefficient for abortion history was 0.228 which signified a weak association. Similarly, a significant association was found between unplanned pregnancy and post-partum depression (p=0.010) with contingency coefficient showing weak association (0.181). Comparison can be made with other obstetric factors like number of pregnancy, mode of delivery and complication during delivery as shown in Table 2. These variables were found to have no significant association with post-partum depression.

Table 2: Association between Obstetric characteristics and Post-partum Depression
### Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Postpartum Depression</th>
<th></th>
<th></th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Yes</strong></td>
<td><strong>No</strong></td>
<td><strong>Yes</strong></td>
<td><strong>No</strong></td>
</tr>
<tr>
<td></td>
<td><strong>N</strong></td>
<td><strong>%</strong></td>
<td><strong>N</strong></td>
<td><strong>%</strong></td>
</tr>
<tr>
<td>-----------------------</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of Pregnancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 or 2</td>
<td>21</td>
<td>21</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>3 or 4</td>
<td>18</td>
<td>27.2</td>
<td>48</td>
<td>72.8</td>
</tr>
<tr>
<td>5 or above</td>
<td>9</td>
<td>31</td>
<td>20</td>
<td>69</td>
</tr>
<tr>
<td>Abortion history</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>33</td>
<td>20.4</td>
<td>128</td>
<td>79.6</td>
</tr>
<tr>
<td>1 abortion</td>
<td>15</td>
<td>46.8</td>
<td>17</td>
<td>53.2</td>
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<td>2 or more</td>
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<td>0</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Planed pregnancy</td>
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<td></td>
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<tr>
<td>Yes</td>
<td>37</td>
<td>21.6</td>
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<td>78.4</td>
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<td>11</td>
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<td>13</td>
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<td>Mode of Delivery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Vaginal</td>
<td>42</td>
<td>23.4</td>
<td>137</td>
<td>76.4</td>
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<td>Cesarean</td>
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<td>37.5</td>
<td>10</td>
<td>62.5</td>
</tr>
<tr>
<td>Complication during Delivery</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>7</td>
<td>43.7</td>
<td>9</td>
<td>56.3</td>
</tr>
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<td>No</td>
<td>41</td>
<td>22.9</td>
<td>138</td>
<td>77.1</td>
</tr>
</tbody>
</table>

**Association between psycho-social factors and postpartum depression**

Significant association was found between History of Mental illness \((p=0.004)\) and family history of Mental illness \((p=0.025)\). However, the contingency coefficient shows weak association between these variables and postpartum depression \((0.204 \text{ and } 0.158 \text{ respectively})\). The Results on table 3 also illustrate that there was no significant association between drinking habits and Post-Partum depression.

Table 3: Association between psychosocial history and Post-partum Depression
## Characteristics of Postpartum Depression

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Postpartum Depression</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>History of Mental Illness</td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
<td>37</td>
</tr>
<tr>
<td>No</td>
<td>44</td>
<td>100</td>
</tr>
<tr>
<td>Family history of Mental Illness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>No</td>
<td>39</td>
<td>136</td>
</tr>
<tr>
<td>Drinking Habit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>No</td>
<td>44</td>
<td>130</td>
</tr>
</tbody>
</table>

### Association between availability of social support and postpartum depression

The association between Maternal Social support and postpartum depression was significant (p=0.000). The strength of association as measured by contingency coefficient was 0.299.

### 4. Discussion

This study found the magnitude of 24.6% to be high. This result is in the range of the pooled prevalence of postpartum depression in Ethiopia, 22.89% (27). A community-based study done in Northwest Ethiopia also found similar results with magnitude of 25% (28). However, a cut-off score of 13 was used in the study and the magnitude maybe slightly higher than the mentioned result if the authors use cut-off score of 11. A similar health facility based study in Debre-Berhan, Ethiopia showed lower prevalence of postpartum depression (15.6%) (29). A community based study in Awi Zone, Ethiopia showed a prevalence rate of 23.7% (30). However, a cutoff score of 8 was used to diagnose PPD, a number lower than the cutoff score used in our study. Another health facility based study in Bahirdar showed the prevalence of postpartum depression to be 22.1% by using 13 as the cutoff score (31). The result in our study is higher than the reported prevalence of postpartum depression in Nairobi, Kenya (13%) Ghana (7%) and a cohort study done in Ethiopia (8, 35, 36). This could be attributed to the different data collection tool used and sample sizes of the studies. In comparison to findings from Egypt (49.5%), South Africa (50.3%), and Nigeria (28%), this study’s level of postpartum depression was shown to be lower (34–36).

This study found no significant association between the socio-demographic factors: age, occupation and marital status with postpartum depression. However, the findings from the study done in Debre-Berhan, Ethiopia indicated that...
postpartum depression was associated with being widowed or widowed, and that married women were four times more likely to develop postpartum depression(29). Moreover, the study done in awi zone also showed corresponding result with divorced, widowed, or single mothers being 3.45 times more likely to develop PPD than those who were married(30). Additionally, A study in Uganda also showed that adolescents were more likely to experience postpartum depression than other age groups(37).

This study found significant association between abortion history and unplanned pregnancy and postpartum depression. A systematic review and meta-analysis done in Ethiopia also found significant association between pregnancy intention and postpartum depression(27) The community based study in Northwest Ethiopia also found significant association of PPD with Abortion with roughly two times the likelihood of experiencing postpartum depression as compared to those who had never had an abortion(28). The same study also showed that respondents who had unplanned pregnancies had a twofold higher risk of experiencing postpartum depression(28). Pregnancy that was not planned was roughly 1.9 times more likely result in PPD than a planned one according to the paper done by Abebe et al.(31). Unwanted pregnancies were also a predictor of postpartum depression symptoms in Egypt(38).

This study found no significant association between number of pregnancies, mode of delivery and pregnancy complications. There was really also no statistically significant correlation between mode of delivery and postpartum depression, according to the systematic review done in Ethiopia by Tolossa et. al.(27). However, the study from Nekemte, Oromia showed that postnatal depression was 4.99 times more likely to affect first-time mothers than mothers who had given birth more than four times(39).

This study found significant association between history of mental illness and family history of mental illness with postpartum depression. The systemic review showed that women with a prior history of depression had 4.52 times the likelihood of developing postpartum depression compared to women without such a history(27). Report from Northwest Ethiopia declared that those with relatives who had a history of mental illness were 1.2 times more likely to be depressed than participants without such a history(28). Previous depression in mothers increased the likelihood of depression by 3.7 times compared to mothers without such a history in Awi Zone, Ethiopia(30).

There was no association between alcohol drinking habits and postpartum depression in our study. The study by Shitu et al. also found no association between postpartum depression and substance abuse(30). However, this is not the same as the results from those of researches conducted in Northern India, Canada, and Bale, Ethiopia(40–42).

There was significant association between the availability of social support and postpartum depression in this study. The meta analysis that included 12 cross-sectional studies also revealed that postpartum depression was 6.59 times more prevalent in women without social support than in those who had good social support(27). Similarly, in the health facility based study in Debre-Berhan showed that mothers with weak social support had a fivefold higher risk of depression than respondents with good social support(29).

The prevalence of postnatal care services is low (6.7%). The community based study in Northwestern part of Ethiopia stated that individuals who did not receive postnatal care were nearly twice as likely to experience postpartum depression as those who did(28).

While the ANC coverage was good in the study area, significantly low portion of the mothers had been told about postpartum depression during their visit (11.8%). According to the study on postpartum depression in Northwestern Ethiopia, respondents who did not receive antenatal care were four times more likely to experience depression than those who did(28).

5. Conclusions
The magnitude of postpartum depression is high among mothers visiting Batu Health Center. This study showed results that are in line with other studies done in Ethiopia. Despite the high magnitude of PPD, measures to help depressed mothers are not brought to action. This highlights the need to advocate for postpartum depression services. Our study showed that even though the magnitude of PPD is high, only a small number of mothers receive postnatal care services. This calls for extension of postnatal care for mothers at primary health care services such as health centers.

Although the mothers with postpartum depression have made it to the health center, our study showed that they go back unnoticed. This prevents our health sector from providing comprehensive care to the population. Postpartum depression screening is a simple but profound step that can be implemented during mothers’ visit to the vaccination centers. Moreover, we found the ANC attendance rate to be good in our study. Hence, we can use the opportunity of ANC visits to give health education on postpartum depression so that mothers can knowledge on the issue. Society based awareness creation programs on postpartum depression can be launched in order for mothers to be understood and supported during the postpartum period. Finally, health professionals can be educated about postpartum depression so that diagnosis of PPD can be made during multiple different encounters of mothers to health facilities. There are certain limitations of this study. The taboo against mental health issues in the society could have affected the mothers’ response to the questions during the interview. Our study is a health facility based study which makes it difficult to generalize to the whole population. In addition, Recall bias is also a factor that can affect the results of our study.

**Abbreviations**

PPD – Postpartum depression  
ANC – Antenatal Care  
EPDS- Edinburgh postpartum depression scale  
MSSS- Maternal social support scale

**Declarations**

**Ethics approval and consent to participate**

Informed consent was taken from every study participant. No mother who was unwilling to participate in the study was required to do so. Permission was taken from Batu Health Center. The study was approved by the Institutional review board of Addis Ababa University, College of Health Sciences. This research was performed in accordance with principles stated in the declaration of Helsinki. No personal information was included on the data sheet, and all information collected from participants was held in confidentiality and utilized only for the purposes of the study.

**Consent for publication**

Not Applicable

**Availability of data and materials**

The datasets used in this study are available from the corresponding author upon request.

**Competing interests**

The authors declare that they have no competing interests

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This study has not received any form of funding and expenses were covered by the authors.
Authors’ contributions

AM, AZ, AN, AA, AB, AY wrote the proposal, collected the data and analyzed the data. AM and SM wrote the final manuscript. AG reviewed and gave directions during the write-up process.

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Figures
Figure 1

Magnitude of mothers who have heard about PPD