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# Experiences of intimate partner violence and antepartum depression among women seeking antenatal care in Addis Ababa, Ethiopia: findings from the MISPOD study

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**Despite the high prevalence of intimate partner violence (IPV) and antepartum depression, there is limited evidence on the association between the two in Ethiopia. We aimed to investigate the association between experience of IPV during and before pregnancy and depression in the third trimester of pregnancy. We surveyed women attending antenatal care clinics in 22 selected health facilities in Addis Ababa in the third trimester of pregnancy. We used a 12-item tool to measure IPV and the Edinburgh Postnatal Depression Scale (EDPS) to measure antepartum depression. We performed multivariable logistic regression analysis to determine the association between IPV and antepartum depression. Of the 399 women included, 14.5% (95% CI: 11.3-18.5%) had symptoms suggestive of antepartum depression (EDPS score ≥ 11) and 31.6% (95% CI: 27.1-36.4%) had recently experienced some form of IPV. The adjusted odds of antepartum depression was 2.24 higher among women who had experienced IPV compared to those who had not (95% CI: 1.11–4.54). Antepartum depression was higher among women aged 15–24 compared to those aged 25–34 (AOR = 2.76, 95% CI: 1.05, 7.23), women with low maternal social support compared to those with adequate support (AOR = 7.04, 95% CI: 2.07, 23.97), and women who worried very often about feeding their family compared to those who did not worry at all (AOR = 8.95, 95% CI: 3.09, 25.94). The findings highlight the need for integrated and tailored interventions to mitigate IPV and antepartum depression to address the needs of adolescent and young women, and those living in poverty or lacking social support.**

**Keywords** Antepartum depression, Intimate partner violence, Perinatal mental health, Pregnancy, Social support

Over the past decade, poor mental health has been increasingly recognised as a significant health problem and a leading cause of disability worldwide[1]. Pregnant and postpartum women are more vulnerable to mental health conditions as physiological and emotional changes during pregnancy and the postpartum period can lead to anxiety and depression[2]. Antepartum depression is a common mental health condition that can manifest as mild or severe depressive symptoms during pregnancy[3]. It is also significantly associated with several pregnancy-related morbidities, including pre-eclampsia, risk of emergency caesarean delivery, maternal anaemia, prematurity, low birth weight, and poor neurodevelopmental outcomes in children, and mortalities[4,5]. Globally, the prevalence of antepartum depression ranges from 15 to 65% (24.2% in Ethiopia)[6], with a higher proportion of women affected

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in low- and middle-income countries (LMICs)[7]. Women diagnosed with antepartum depression are also at higher risk of developing postpartum depression[4], which has far-reaching negative consequences, including poor mother-child bonding and breastfeeding practices[8], and reduced quality of life[9].

While the exact causes of antepartum depression are not fully understood, stress, lack of social support, intimate partner violence (IPV), dissatisfaction with intimate relationships, pregnancy complications, and other maternal characteristics have been identified as some potential contributing factors[7]. IPV against women, which can manifest as physical, emotional, or sexual violence, is a serious and pervasive public health concern worldwide and can lead to a host of negative physical, psychosocial, and mental health consequences[10]. Evidence suggests that pregnant women are more vulnerable to IPV and are more likely to experience all forms of violence[11]. A recent systematic review reported that the pooled prevalence of IPV among pregnant women in Ethiopia was 32%[12].

Despite the multidimensional burden of antepartum depression, little attention is given to promoting mental health during pregnancy in low-resource settings[7]. Low awareness of mental health conditions among women and primary health care workers, and the lack of standardised screening protocols, are the main challenges to integrating perinatal mental health screening into routine maternal health services[13]. Mental health screening during pregnancy would make a significant contribution to reducing adverse obstetric and perinatal outcomes, including postpartum depression[14]. In this regard, antenatal care provides a unique opportunity for health workers to assess mental health conditions, including their risk factors, and to provide client-centred supportive care to women[15].

Despite the World Health Organization's recommendations for routine universal mental health screening for all women in the perinatal period[15], perinatal mental health screening has not been well integrated into the routine maternal and child health services in Ethiopia[7], resulting in the underdiagnosis and undertreatment of perinatal depression[16,17].

Ethiopia's Mental Health Strategy, launched in 2012, was an important milestone in providing a strategic roadmap to address the burdens of mental health conditions in the country, but it lacked the depth to address the mental health needs of pregnant and postpartum women[18]. Ethiopia also adopted the Mental Health Gap Action Programme (mhGAP), which aims to ensure access to comprehensive mental health care, including care for perinatal mental health conditions[19]. However, several system-level and demand-side challenges including lack of governance to support and scale up mental health services, lack of training and capacity of health workers to provide the service, and psycho-cultural misconceptions of mental disorders, have been the major setbacks to the implementation of these initiatives[20].

While there are studies on IPV and postpartum depression, evidence on the association between IPV and antepartum depression is limited. Understanding the role of IPV in antepartum depression and other mental health conditions would also help to inform the design of context-appropriate mental health interventions across the maternal continuum of care. In this study, we aimed to examine the association between IPV and symptoms suggestive of antepartum depression, controlling for maternal- and pregnancy-related characteristics and maternal social support. The findings of our study will add insights to the existing evidence that could be used to inform policy and prevention frameworks in Ethiopia and other similar settings in LMICs.

## Materials and methods

### Study context

Health care delivery in Ethiopia is organised into three levels (primary, secondary, and tertiary)[21]. The primary level of care is provided by primary hospitals, health centres, and health posts mainly in rural areas and by health centres in urban areas. The majority of primary level of care is provided by the (urban) Health Extension Programme. General hospitals provide secondary level of care to a population of 1 to 1.5 million people. Teaching and specialised hospitals provide tertiary level of care. In Addis Ababa, the setting of this study, maternal health services are provided in public- and private-owned health centres, hospitals, and clinics. According to the 2019 Mini Demographic and Health and Survey report, 96.9% of pregnant women in the city had received antenatal care from a skilled health worker[22].

### Study design and population

This cross-sectional study is part of a broader mixed methods longitudinal study (MISPOD study) which aimed to understand the link between the mistreatment of women during childbirth in health facilities and postpartum depression[23]. Two rounds of surveys have so far been conducted, the first during the third trimester of pregnancy (May to June 2023) in health facilities and the second in the postpartum period (July to October 2023) in the community. This study is based on data from the first-round survey.

### Sampling procedures and data collection

Pregnant women who had lived in Addis Ababa city for at least six months prior to the survey and who were at least 28 weeks' gestation were eligible for inclusion in the first-round survey. Pregnant women who sought antenatal care at 22 sampled health facilities (seven public hospitals, 11 public health centres, and four private hospitals/maternal and child health centres) in Addis Ababa were included. We prospectively recruited 20 to 21 women per health facility at the end of their routine antenatal care visits. Details of the sample size calculation and health facility and participant selection are available in the study protocol[23]. For this study, we included 399 women who had been in a union (married or cohabiting) for at least 12 months preceding the survey, as the IPV questions had a 12-month recall period. We also performed a posthoc power analysis to ensure that the sub-sample of the first-round survey (the number of women who had been married or cohabiting for at least 12 months) was sufficient to address our research question: what is the association between exposure to IPV and

antepartum depression? We found a posthoc power of 0.96, indicating that the sample of 399 was sufficient to detect an association between IPV and antepartum depression.

Data were collected using a structured questionnaire with five sections: sociodemographic and household characteristics, obstetric and previous service characteristics, social support and marital satisfaction, antepartum depression screening, and IPV. The questionnaire was originally developed in English and translated into Amharic. Data were collected using the Amharic version. Before data collection, the tool was pre-tested by surveying women attending antenatal care service at a public health centre not selected for the study in Addis Ababa. After the pre-test, a debriefing meeting was held with the data collectors and appropriate adjustments to the questionnaire and field coordination were made. Five female health professionals and a field supervisor, not affiliated with the 22 health facilities, collected data using an electronic questionnaire designed using the KoboToolbox application. Two of the investigators (SG and AA) trained the data collection team for three days on the study objectives, participant recruitment, contents of the questionnaire, administering sensitive questions, research ethics, basic psychosocial support and counselling skills, and referral of women with symptoms suggestive of depression. At the end of their routine antenatal care visit, women in the third trimester of pregnancy were asked by the data collectors if they were interested in participating. The data collectors then provided information about the study in plain language and asked eligible women for voluntary and informed consent to participate in the study. Completed questionnaires were first checked for completeness and consistency by the field supervisor and then uploaded to the data server and confirmed by the principal investigator (AA) of the study on a daily basis.

## Variables

The main dependent (outcome) variable in this study was symptoms suggestive of antepartum depression assessed using the Edinburgh Postnatal Depression Scale (EPDS) validated for use in the Ethiopian context. Semantic, content, technical, criterion and construct validity of EPDS was validated using Comprehensive Psychopathological Rating Scale as a gold standard[24]. The EPDS has ten items, each containing response scales scored 0 to 3 and is a widely used tool to screen for perinatal depression (Supplementary file 1). In this study, a woman was considered to have symptoms suggestive of antepartum depression if she had an EPDS score of 11 or higher (from the maximum score of 30); the score was calculated by summing up the individual values of the EPDS items. We used this cut-off due to its higher combined sensitivity and specificity according to a recent meta-analysis of 58 studies[25].

The main independent (exposure) variable of this study was experience of IPV, measured using a 12-item checklist (supplementary file 2) adapted from the 2016 Ethiopian Demographic and Health Survey (EDHS) questionnaire[26]. A woman was considered to have experienced IPV if she reported at least one of the 12 components of IPV in the 12 months preceding the survey. Based on the type of violence reported, we also grouped IPV into three forms: physical (seven items), sexual (two items) and emotional (three items). We considered a woman who responded 'yes' to at least one of the seven items assessing physical IPV to 'have experienced physical IPV'; 2) we considered a woman who responded 'yes' to at least one of the two items assessing sexual IPV to 'have experienced sexual IPV'; 3) we considered a woman who responded 'yes' to at least one of the three items assessing emotional IPV to 'have experienced emotional IPV'. Additionally, we categorised the number of IPV forms (physical or sexual or emotional) experienced as either 0 (none of the three IPV forms) or 1 (only one of the three IPV forms) or 2 (only two of the three IPV forms) or 3 (all three of the IPV forms).

To measure women's social support status, we used the Maternity Social Support Scale (MSSS), which has six items on a five-point Likert scale each. We summed the scores and categorised social support as low (1-8), moderate (9-24) and adequate (25-30) as per the classification suggested by Webster and colleagues[27]. We also collected data on sociodemographic characteristics (age group at time of the survey, educational status, worry about feeding family asked using a scale of not at all, hardly ever, sometimes, and very often), parity (categorised as nullipara, primipara, and multipara), place of childbirth of previous baby (for multiparas), pregnancy intention, number of antenatal care visits during the current pregnancy (categorised as 1–3 and 4 or more), pregnancy complication/s, and type of facility (public health centre, public hospital, and private hospitals/maternal and child health centres).

## Data management and analysis

Mean, median, standard deviation and interquartile range were used to summarize continuous variables. For categorical variables, frequencies and percentages with their 95% confidence intervals (CI) were reported. Crosstabulation and chi-square tests were used to describe the prevalence of antepartum depression and experience of IPV.

A multivariable logistic regression model was fitted to examine the association between IPV and antepartum depression, adjusting for social support and other characteristics. A priori selection of independent variables was conducted based on existing evidence and hypothesised relationship with the outcome variable. Social support, maternal age, parity, frequency of antenatal care, pregnancy complications, and type of facility were included in the final model. Multicollinearity among the variables was assessed using variance inflation factor (VIF) and the values were low (< 5), indicating the absence of collinearity. Odds ratios and corresponding 95% CIs were estimated for the predictors. All analyses were performed in StataSE v.16 (StataCorp, College Station, Texas, United States).

## Ethical considerations

The study was approved by the Institutional Review Boards (IRB) of Institute of Tropical Medicine, Antwerp (reference number: 1656/23 and 1672/23) and the Ethical Clearance Committee at Addis Ababa City Administration Health Bureau (reference number: A/A/H/10932/229). Permission and support letters were

sought from local authorities of Addis Ababa city administration. Written informed consent was obtained from the study participants after explaining the objectives, benefits and potential harms anticipated from the study. According to the Ethiopian National Research Ethics Review Guideline, married and/or pregnant women between the ages of 15 and 17 are considered emancipated minors and can give written informed consent[28]. This study followed the Helsinki declaration and the General Data Protection Regulation (GDPR) of the European Union.

### Patient and public involvement

Women in their third trimester of pregnancy and who sought antenatal care in the study facilities during the survey periods were invited to participate in the study. Study participants were not involved in research design, tool development, data analysis and reporting.

## Results

### Characteristics of study sample

A total of 442 women participated in the survey and 43 (9.7%) women were dropped because their marital relationship lasted less than 12 months before the survey or they were not in union. Among the 399 women in the analytic sample, the mean (± SD) age of the women was 28.5 (4.5) years and more than two-thirds of them were in the age group 25–34 years. A third of the women attended more than secondary school, while one-fourth did not complete primary education. Additionally, more than half (52.4%) of the women were housewives. Almost a tenth of the participants had worried very often about not being able to feed their family in the four weeks preceding the survey. The median (IQR) gestational age of the women at the time of the survey was 36 (32-38) weeks. More than three-quarters (77.4%) of women reported that their current pregnancy was intended. Furthermore, 82.2% of women had completed four or more ANC visits at the time of the survey. About 14% of women reported they had pregnancy complications during their current pregnancy. Regarding social support, 10.4% of the women had low and 46.5% had medium scores (Table 1).

### Prevalence of intimate partner violence

Among the women, 31.6% (95% CI: 27.1–36.4) reported having experienced at least one type of IPV in the 12 months preceding the survey. The most common form of IPV was emotional violence (27.3%), followed by physical violence (10.1%), and sexual violence (7.5%). Furthermore, 7.8% of women experienced two and 2.7% three forms of IPV (Table 2).

### Prevalence of symptoms suggestive of antepartum depression

Among the participants who were screened for antepartum depression ($n = 395$), 14.7% (95%CI: 11.3–18.5) had symptoms suggestive of antepartum depression (EDPS ≥ 11). The median (IQR) EPDS score among total women was 5 (2-8). The mean ± SD of the EDPS score of women with symptoms suggestive of antepartum depression ($n = 58$) was 14.4 ± 3.4.

Chi-square tests for cross-tabulations of each item and form of IPV with symptoms suggestive of antepartum depression showed crude associations between some IPV items and all forms of IPV (Table 3).

### Association between IPV and symptoms suggestive of antepartum depression

Ten variables were included in the multivariable logistic regression model. Experience of any IPV had a statistically significant association with symptoms suggestive of antepartum depression. After adjusting for other independent variables, participants who experienced any IPV were twice as likely to have symptoms suggestive of antepartum depression compared to those who did not experience any IPV (aOR 2.24; 95% CI: 1.11–4.54). Additionally, younger maternal age, low maternal social support, and worry about being able to feed family in the four weeks prior to the survey were significantly associated with higher adjusted odds of symptoms suggestive of antepartum depression (Table 4).

## Discussion

We examined the association between the experience of IPV in the past 12 months and symptoms suggestive of antepartum depression among urban women attending antenatal care in Addis Ababa, Ethiopia. Our findings showed that approximately one in seven pregnant women had symptoms suggestive of antepartum depression in their third trimester of pregnancy. IPV, maternal social support, age, and worry about being able to feed family were significantly associated with symptoms suggestive of antepartum depression.

The prevalence of symptoms suggestive of antepartum depression found in our study (14.7%) is consistent with findings reported from urban settings in Nigeria (14.1%)[29] and Tanzania (15%)[30]. However, the prevalence was lower than reported in a systematic review of 58 studies from both rural and urban settings of Ethiopia (24.2%; 95% CI: 19.8, 28.6)[31]. The difference may be due to variations in demographic and socioeconomic characteristics, and in the methods and timing of depression measurement between the different studies included in the systematic review and our study. Several studies have shown that rural women are more vulnerable to antepartum depression due to socioeconomic disadvantage, poor access to health services, and entrenched patriarchal social norms[32]. Patriarchy not only influences women to normalise abuse, it also expects them to accommodate abuse and makes them vulnerable to victim blaming, which in turn can worsen their emotional wellbeing[33].

In terms of measurement approach, the use of an interviewer-administered screening tool in our study may have resulted in a lower prevalence of antepartum depression than would have been obtained using a self-administered screening tool[25]. This is because of the sensitivity of discussing mental health issues which

| Variables | n (%) |
|---|---|
| Age group | |
| 15 – 24 | 71 (17.8) |
| 25 – 34 | 285 (71.4) |
| 35 – 44 | 43 (10.8) |
| Marital status | |
| Married | 394 (98.7) |
| Cohabiting | 5 (1.3) |
| Educational level | |
| More than secondary | 135 (33.8) |
| Completed grade 12 | 33 (8.3) |
| Secondary school (grade 9—12) | 74 (18.5) |
| Completed grade 8 | 39 (9.8) |
| Primary school (grade 1—8) | 100 (25.1) |
| No formal education | 18 (4.5) |
| Occupation | |
| Government employee | 57 (14.3) |
| Housewife | 209 (52.4) |
| Private business owner | 39 (9.8) |
| Private sector employee | 84 (21.1) |
| Other* | 10 (2.6) |
| Household size | |
| < 3 | 101 (25.3) |
| 3 – 4 | 198 (49.6) |
| 5 or more | 100 (25.1) |
| Worried about feeding family in 4 weeks prior to the survey | |
| Not at all | 228 (57.3) |
| Hardly ever | 72 (18.1) |
| Sometimes | 60 (15.1) |
| Very often | 36 (9.0) |
| Don't know/refused to answer | 2 (0.5) |
| Parity | |
| Multipara (2 + previous births) | 127 (31.8) |
| Primipara (1 previous birth) | 146 (36.6) |
| Nullipara (no previous births) | 126 (31.6) |
| Among multipara, place of childbirth for previous child (n = 273) | |
| Health facility | 266 (97.4) |
| Home | 7 (2.6) |
| Type of gestation (current pregnancy) | |
| Singleton | 383 (96.0) |
| Multiple | 5 (1.3) |
| Do not know | 11 (2.8) |
| Number of antenatal visits for current pregnancy | |
| 1 – 3 | 71 (17.8) |
| 4 or more | 328 (82.2) |
| Pregnancy complication during current pregnancy | |
| Yes** | 57 (14.3) |
| No / don't know | 341 (85.7) |
| Pregnancy intention (of index pregnancy) | |
| Intended | 309 (77.4) |
| Unintended (mistimed or unwanted) | 90 (22.6) |
| Maternity social support status | |
| Low | 40 (10.4) |
| Medium | 179 (46.5) |
| Adequate | 166 (43.1) |

**Table 1**. Sociodemographic and obstetric characteristics of participants ($n = 399$).

| Variables | N (%) |
|---|---|
| Experienced any form of IPV | |
| Yes | 126 (31.6) |
| No | 273 (68.4) |
| Number of IPV forms experienced | |
| None | 273 (68.4) |
| One | 84 (21.1) |
| Two | 31 (7.8) |
| Three | 11 (2.7) |
| Forms of IPV experienced* | |
| Emotional | 109 (27.3) |
| Physical | 40 (10.1) |
| Sexual | 30 (7.5) |

**Table 2**. Reported experience of intimate partner violence in the 12 months prior to the survey, by type ($n = 399$).

might influence women to underreport the mental health challenges they experience. However, despite these methodological considerations, screening of pregnant women for symptoms suggestive of antepartum depression by health workers in LMICs has been shown to play a critical role in providing timely psychosocial care and support to women and preventing further complications[15]. Future research is needed to explore the feasibility of using self-administered screening tools in settings with limited health literacy, including Ethiopia.

In our study, almost a third (31.6%) of women had experienced some form of IPV in the 12 months prior to the survey, which is comparable to the pooled prevalence of IPV during pregnancy (32.2%) reported in a systematic review of 17 studies in Ethiopia[12]. On the other hand, the prevalence of IPV found in our study is higher than that found in a study in rural southern Ethiopia, which is consistent with evidence from the field that rural women are less likely to report experiencing IPV and that IPV is highly normalised in rural settings[34]. Underreporting of IPV may be related to cultural norms and the stigmatisation of victims of IPV[35]. In addition, women who experienced IPV were more than two times more likely to have symptoms suggestive of antepartum depression, which is consistent with an estimate from a systematic review which reported that women who experienced IPV during their pregnancy were 1.69 to 3.76 times more likely to have antepartum depression[36]. Evidence suggests that both IPV and antepartum depression have a direct and causal relationship with poor pregnancy outcomes and child morbidity and mortality[37]. A potential mechanism of IPV related depression may also be through chronic stress that associated with endocrine and immune-inflammatory dysregulations[38]. Victims of IPV are often isolated from social interactions and support networks, making them potentially vulnerable to depression. Furthermore, IPV may negatively affects victims' self-esteem, confidence, and self-worth, which may ultimately result in depressive symptoms.

A recent study from the Performance Monitoring for Action (PMA) - Ethiopia cohort study reported that the prevalence of IPV among pregnant women in Ethiopia increased from a pre-pandemic prevalence of 10.5–15.1% during the COVID-19 pandemic[39]. As the IPV assessment tool used in our study had a 12-month recall period, which was mainly before the COVID-19 pandemic was declared over in May 2023, we believe that the participants of our study were also more vulnerable to IPV. Similarly, a systematic review and meta-analysis of cohort studies reported that symptoms of depression increased significantly during the pandemic, mainly as a result of pandemic control measures[40]. Therefore, we believe that some of the levels of both IPV and symptoms suggestive of depression in our study may be due to the role of the COVID-19 pandemic. Poor social support is strongly associated with both the experience of IPV and antepartum depression[41], as also observed in our study. A secondary analysis of Demographic and Health Survey data from 34 SSA countries found that violence against women is normalised in communities and victims are expected to cope, leading them not to seek for support from their close networks[42]. Therefore, it is imperative to identify and address the barriers to women's access to social support systems. Strengthening community and family support systems for pregnant and postpartum women is critical to alleviating women's physical and emotional distress, providing comfort and reassurance, promoting healthy behaviours and access to health care, and encouraging women to disclose their experiences of violence to health professionals[43]. However, in the Ethiopian context, the lack of awareness among health workers about IPV and its consequences, and the perception that providing IPV-related care and support is outside their role[44], highlights the urgent need to strengthen the integration of care and support for women experiencing IPV into routine services.

The high prevalence of both antepartum depression and IPV, and the association between the two, justifies the need for multidimensional interventions that address the underlying risk factors for both IPV and antepartum depression and ensure appropriate promotion, prevention, and response systems for both. Strengthening innovative and context-appropriate interventions to integrate perinatal mental health services into primary health care settings in Ethiopia is key to promoting women's perinatal mental health. In this regard, (1) synthesising success stories of past and ongoing interventions, (2) exploring the lived experiences of victims of IPV and depressed women, (3) engaging women in the design of new interventions, strengthening multisectoral approaches, and (4) building communities' trust in the health system are key to ensuring access to a wide range

| IPV experience in the 12 months prior to the survey | Had symptoms suggestive of antepartum depression; *n* (%) | *p*-value for $x^2$ |
|---|---|---|
| Emotional violence | | |
| Yes | 30 (27.8) | < 0.001 |
| No | 28 (9.8) | |
| Said or did something to humiliate you in front of others | | |
| Yes | 4 (33.3) | 0.063 |
| No | 53 (13.9) | |
| Insulted you or made you feel bad about yourself | | |
| Yes | 30 (27.9) | < 0.001 |
| No | 28 (9.8) | |
| Physical violence | | |
| Yes | 15 (37.5) | < 0.001 |
| No | 43 (12.2) | |
| Pushed you, shook you or threw something at you | | |
| Yes | 12(52.2) | < 0.001 |
| No | 46 (12.4) | |
| Slapped you or twisted your arm | | |
| Yes | 12 (36.4) | < 0.001 |
| No | 46 (12.7) | |
| Punched you with his fist or with something that could hurt you | | |
| Yes | 8 (66.7) | < 0.001 |
| No | 50 (13.1) | |
| Kicked you or dragged you | | |
| Yes | 4 (57.1) | < 0.001 |
| No | 53 (13.9) | |
| Tried to strangle you or burn you | | |
| Yes | 1 (25.0) | 0.561 |
| No | 57 (14.6) | |
| Attacked you with a knife, gun, or other type of weapon | | |
| Yes | 0 (0.0) | - |
| No | 58 (14.8) | |
| Threatened to hurt or harm you or someone you cared about | | |
| Yes | 3 (42.7) | 0.032 |
| No | 55 (14.2) | |
| Threatened you with a knife, gun, or other type of weapon | | |
| Yes | 1 (33.3) | 0.362 |
| No | 57 (14.6) | |
| Sexual violence | | |
| Yes | 12 (40.0) | < 0.001 |
| No | 46 (12.6) | |
| Physically forced you to have sexual intercourse with him even when you did not want to | | |
| Yes | 10 (37.0) | 0.001 |
| No | 48 (13.0) | |
| Forced you to perform other sexual acts you did not want to | | |
| Yes | 3 (75.0) | 0.001 |
| No | 55 (14.1) | |
| Any form of Intimate Partner Violence | | |
| Yes | 32 (25.6) | < 0.001 |
| No | 26 (9.6) | |

**Table 3**. Association between intimate partner violence and symptoms suggestive of antepartum depression.

| Variables | Symptoms suggestive of antepartum depression | | Adjusted OR (95% CI) |
|---|---|---|---|
| | Yes, *n* (%) | No, *n* (%) | |
| Experience of any IPV | | | |
| Yes | 32 (55.2) | 93 (27.6) | **2.24 (1.11, 4.54)** |
| No | 26 (44.8) | 244 (72.4) | Ref |
| Maternal age | | | |
| 15–24 | 17 (29.3) | 54 (16.0) | **2.76 (1.05, 7.23)** |
| 25–34 | 35 (60.3) | 246 (73.0) | Ref |
| 35–44 | 6 (10.3) | 37 (11.0) | 0.73 (0.23, 2.27) |
| Parity | | | |
| Multipara | 20 (34.5) | 106 (31.5) | 1.40 (0.50, 4.00) |
| Primipara | 22 (37.9) | 123 (36.5) | 1.20 (0.48, 3.04) |
| Nullipara | 16 (27.6) | 108 (32.0) | Ref |
| Number of ANC visits for current pregnancy | | | |
| 1–3 | 11 (19.0) | 60 (17.8) | Ref |
| 4 or more | 47 (81.0) | 277 (82.2) | 1.10 (0.46, 2.67) |
| Pregnancy complication during current pregnancy | | | |
| Yes | 12 (20.7) | 44 (13.1) | 1.89 (0.77, 4.62) |
| No | 46 (79.3) | 292 (86.6) | Ref |
| Type of the facility visited for antenatal care | | | |
| Private hospital or maternal and child health centre | 8 (13.8) | 64 (19.0) | Ref |
| Public hospital | 20 (34.5) | 93 (27.6) | 1.24 (0.39, 3.96) |
| Public health centre | 30 (51.7) | 180 (53.4) | 0.56 (0.17, 1.77) |
| Maternal social support | | | |
| Low (6–18) | 15 (25.9) | 25 (7.4) | **7.04 (2.07, 23.97)** |
| Medium (19–25) | 33 (56.9) | 145 (43.0) | **3.73 (1.46, 9.58)** |
| Adequate (26–30) | 8 (13.8) | 155 (46.0) | Ref |
| Pregnancy intention (of current pregnancy) | | | |
| Intended | 43 (74.1) | 263 (78) | Ref |
| Unintended | 15 (25.9) | 74 (22.0) | 0.62 (0.28, 1.40) |
| Educational level | | | |
| No education | 5 (8.6) | 13 (3.9) | Ref |
| Primary school | 22 (37.9) | 77 (22.8) | 2.12 (0.56, 8.06) |
| Completed grade 8 | 4 (6.9) | 34 (10.1) | 0.98 (0.17, 5.53) |
| Secondary school | 12 (20.7) | 60 (17.8) | 2.79 (0.63, 12.37) |
| Completed grade 12 | 7 (12.1) | 26 (7.7) | 2.08 (0.43, 10.15) |
| Secondary plus | 8 (13.8) | 127 (37.7) | 1.45 (0.30, 7.00) |
| Worry about being able to feed family in the four weeks prior to the survey | | | |
| Not at all | 14 (24.1) | 210 (62.3) | Ref |
| Hardly ever | 10 (17.2) | 62 (18.4) | 2.34 (0.89, 6.20) |
| Sometimes | 19 (32.8) | 41 (12.2) | **8.40 (3.33, 21.18)** |
| Very often | 15 (25.9) | 21 (6.2) | **8.95 (3.09, 25.94)** |

**Table 4**. Multivariable logistic regression model for the association between IPV and symptoms suggestive of antepartum depression ($n = 394$).

of services (primary and secondary prevention) for both antepartum depression and IPV[45,46]. Similarly, building the capacity of health systems to provide holistic care for victims of IPV and depressed women is key to avert further sequalae.

## Strengths and limitations

Our study has several strengths. To the best of our knowledge, it is one of the few studies in Addis Ababa to examine the association between IPV and antepartum depression by recruiting representative women from all sub-cities who attended antenatal care in public and private facilities. Given, the high proportion of women who seek at least one antenatal visit (96.9% in 2019)[22,47], we believe that the findings are representative. Recruitment of women in the third trimester of pregnancy also allowed us to better account for depression, which may not have been possible if women in the first and second trimesters were included, as most episodes of perinatal depression manifest in the third trimester and in the first six weeks postpartum. Additionally, we believe that

our approach of collecting data by female health professionals using locally validated tools to measure both IPV and antepartum depression resulted in highly reliable and valid results. However, because of the sensitive nature of the topics under investigation (IPV and mental health issues), women might have under-reported their experiences of these and that might have resulted in the underestimation of the prevalence of both IPV and symptoms suggestive of antepartum depression. The 12-month recall period for the IPV-related questions might also have introduced recall bias. In addition, the cross-sectional design of our study does not capture the temporal relationship between IPV and antepartum depression.

## Conclusions

Our study found that approximately one in three women in their third trimester of pregnancy in Addis Ababa experienced IPV in the 12 months prior to the survey, and one in seven had symptoms suggestive of antepartum depression. Experience of IPV was highly associated with antepartum depression. Women with IPV were twice as likely as those without IPV to have symptoms of depression. The pervasiveness of violence against women in general, and IPV in particular, and the limited capacity to provide comprehensive care and support for women with perinatal depression in Ethiopia highlight the urgent need to scale up integrated response systems to avert the burden of both IPV and perinatal depression. Strengthening the integration of violence prevention and response and perinatal mental health services into routine antenatal care is critical to address the perinatal mental health needs of women[48]. Future research is needed to understand the complex dynamics between IPV and antepartum depression and the barriers and facilitators to promoting the rights and perinatal mental health of pregnant women.

## Data availability

The dataset used for this study is available from the principal investigator (AA) upon reasonable request. The principal investigator will then forward the request to the Data Access Committee at the Institute of Tropical Medicine which reviews requests case-by-case and make decisions as per the committee's guidelines.

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## Author contributions

AA conceived and designed the study; SG and LB contributed to the design of the study; AA and SG trained data collectors and coordinated the fieldwork; NBY and AA analysed and interpreted the data; LB reviewed the data analysis and interpretation; NBY and AA drafted the manuscript; SG, AHM, MZ, LB and GF revised the manuscript for intellectual content. All authors have read and approved the final manuscript.

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## Declarations

## Competing interests

The authors declare no competing interests.

## Additional information

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