




Prevalence and Associated Factors of Intimate Partner Violence During Pregnancy in Eastern Ethiopia

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Background: Intimate partner violence is a major public health problem and a gross violation of human rights. The consequences of this violation are severe during pregnancy as the fetus/newborn could also be affected negatively. The aim of this study was to assess the prevalence and associated factors of intimate partner violence during pregnancy (IPVP) in Eastern Ethiopia.

Methods: A community-based cross-sectional study was conducted among 3015 postpartum mothers in Eastern Ethiopia. Data were collected using the WHO Violence Against Women questionnaire. Factors associated with IPVP were assessed by a log-binomial regression model using Stata version 14.

Results: The overall prevalence of IPVP was 30.5% (95% CI: 28.8, 32.1); the prevalence for psychological violence was 24.4% (95% CI: 22.9, 26.0), physical violence was 11.9% (95% CI: 10.8, 13.2) and sexual violence was 11.0% (95% CI: 9.9, 12.2). About 95% of acts of sexual violence were in the form of forced sex. In multivariable analysis, women's education was associated with a decreased prevalence of all forms of IPVP. Previous experience of infant loss and not drinking alcohol were associated with lower prevalence of all IPVP types, except for the physical form. Working for cash and having medium household decision-making autonomy increased the prevalence of all forms of IPVP. Being older, living in an extended family, husband's/partner's habitual khat chewing and discordant pregnancy intentions increased the prevalence ratio (PR) of all forms of IPVP, except for sexual violence. Compared to being urban, being rural decreased the PR of sexual IPVP by 59% (adjusted prevalence ratio [APR]=0.41; 95% CI: 0.27, 0.60) and psychological IPVP by 32% (APR=0.68; 95% CI: 0.53, 0.87). Husband's/partner's support for antenatal care use decreased the PR of physical IPVP by 56% (APR=0.44; 95% CI: 0.25, 0.78).

Conclusion: Nearly one-third of pregnant women experienced IPVP. The great majority of them were subjected to forced sex by their husband/partner. This calls for urgent attention at all levels of societal organization, requiring stakeholders and policy makers to tackle the situation.

Keywords: intimate partner violence, pregnancy, women, abuse, Ethiopia

Background

The World Health Organization (WHO) defines intimate partner violence (IPV) against women as behavior within an intimate relationship that causes harm, including physical aggression, sexual coercion, psychological abuse and controlling behaviors by a current or former male intimate partner.¹ It is considered as a gross violation of human rights.² Violence against women can happen at any time in a woman's life, including during pregnancy.³

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Several studies have indicated that pregnancy increases the risk of IPV.⁴⁻⁷ The increased risk of IPV has been found to be associated with ambivalent feelings about the pregnancy and unborn child, mounting economic pressures on the family, and decreased physical and emotional availability due to the pregnancy.^{4,6,8} Other studies suggest that pregnancy may also be protective against IPV if both members of the couple share the excitement and joy of becoming pregnant, and that the excitement increases the husband's biological and social drives to become supportive.^{9,10}

The burden of intimate partner violence during pregnancy (IPVP) was estimated to vary between 1% and 28% globally.¹¹ An average global prevalence of 17% for sexual IPVP was also reported in a meta-analysis and a higher prevalence is commonly reported in developing countries.¹² In Africa, the overall prevalence of IPVP ranges between 2.3% and 57.1%; the commonest form is psychological violence (2–49%), followed by physical (23–40%) and sexual violence (3–27%).¹³ A systematic review of studies on IPVP in Ethiopia indicated a 26.1% overall prevalence, with the highest prevalence reported in Oromia regional state (35%).¹⁴

IPVP is increasingly recognized both as a major public health problem and as an issue of gross human rights violation owing to the severe health consequences for the mother, fetus and newborn.¹⁵ The adverse health effects for the mother include injuries and chronic pain, sexually transmitted infections, traumatic fistulae, pelvic inflammatory diseases and poor general health;¹⁶⁻¹⁸ mental health disorders such as maternal depression, anxiety and suicidal tendencies;^{19,20} no or inadequate use of maternal health-care services;^{21,22} and poor parenting.²³ Poor pregnancy/birth outcomes, including fetal loss, low birth weight, premature birth and newborn death, have also been linked to IPVP.²⁴⁻²⁶

As described in an ecological framework on violence against women, the occurrence of IPV against women is influenced by several factors, which are diverse and basically interconnected at individual and relationship levels.²⁷ Most of the prior studies in Ethiopia identified individual characteristics of the women and their intimate partners, including low level of education, being a young age, early age at marriage, alcohol abuse, being a full-time housewife and living in rural areas, as contributors to IPVP.²⁸⁻³² Some studies have also highlighted relationship factors, such as male dominance in economic and decision-making autonomy in the family, as well as supportive attitudes

towards wife-beating, as precursors of IPVP.^{28,33,34} Pregnancy-related factors, including attendance at antenatal care (ANC), pregnancy being planned or not, and history of previous pregnancy outcomes, were also indicated in different studies in Ethiopia.^{32,34-37}

Most of the previous studies in Ethiopia were conducted in clinical settings.^{28,30,32-37} The others were conducted in the community, in small samples of currently pregnant women^{29,31}, or general population of women asking about abuse during past pregnancies,^{11,38} and were therefore prone to recall bias. Little is known about the magnitude of and the risk factors associated with the occurrence of different forms of IPVP (physical, sexual and psychological) in Ethiopia. Therefore, this study aimed (1) to estimate the prevalence of the different forms of IPVP (physical, sexual, psychological and overall IPVP), and (2) to identify factors associated with IPVP in Eastern Ethiopia.

Methods

Study Design and Setting

A community-based cross-sectional study design was used. The study was conducted in both rural (Kersa district) and urban (Harar town) populations in Eastern Ethiopia. The study sites run a health and demographic surveillance system (HDSS). The Kersa HDSS, which is predominantly rural, has 24 randomly selected kebeles (the smallest administrative unit in Ethiopia) with an estimated 127,000 inhabitants. The Harar HDSS, which is predominantly urban, has 12 kebeles with an estimated 56,000 inhabitants. Trade is the main livelihood of the people in Harar, whereas farming is the major source of livelihood for people in Kersa district. Khat (*Catha edulis*), a stimulant green leaf, constitutes a significant share of the trade and farming in Eastern Ethiopia. Khat chewing is prevalent in both Harar and Kersa communities.³⁹ The study was conducted between January 2018 and October 2018.

Study Population and Recruitment

The study population comprised currently partnered mothers within the first 6 weeks of birth who were permanently residing in either the rural Kersa or urban Harar HDSS study site. A mother was considered currently partnered if she was either living together with her husband (formally married) or living together with an intimate partner in an informal marriage, at least during the index pregnancy. We excluded pregnant women not in any type

of union because pregnancy might be from forced or voluntary casual sexual relationships.

As a first procedure, a house-to-house census was carried out to identify all pregnant women using a pregnancy-screening questionnaire and procedure, as described by Assefa et al.⁴⁰ The pregnancy screening was carried out initially for all women and then at an interval of 3 months for those who were not pregnant at the initial screening. During the study period, a total of 3425 women were identified as being pregnant (Figure 1).

We calculated the expected date of delivery for all pregnant women in the study based on the women's responses. Every pregnant woman was visited repeatedly through to the end of pregnancy (to determine the outcome of the pregnancy) and, when the outcome was known to be a live birth, until the sixth week postpartum to administer the survey questionnaire. As this study was part of another study that assessed the relationship between IPVP and neonatal mortality in the same population, women who

had live births were considered for interview. Thus, a final sample of 3015 currently partnered postpartum mothers who had live births were included in or considered for this study, as shown in Figure 1.

Data Collection and Management

The WHO multi-country study questionnaire, which was used previously in various studies in Ethiopia, was used to elicit necessary information on IPVP.¹¹ The English version of the instrument was translated into local languages (Amharic and Afan Oromo) by fluent speakers of the languages and backtranslated to English by another person to ensure consistency and accuracy.

Data were collected by trained female data collectors and field supervisors; all had at least secondary school level education. We used only female data collectors and supervisors to enhance disclosure of the IPVP experience, which is in accordance with the WHO ethical safety recommendations.⁴¹ The field staff were given 1

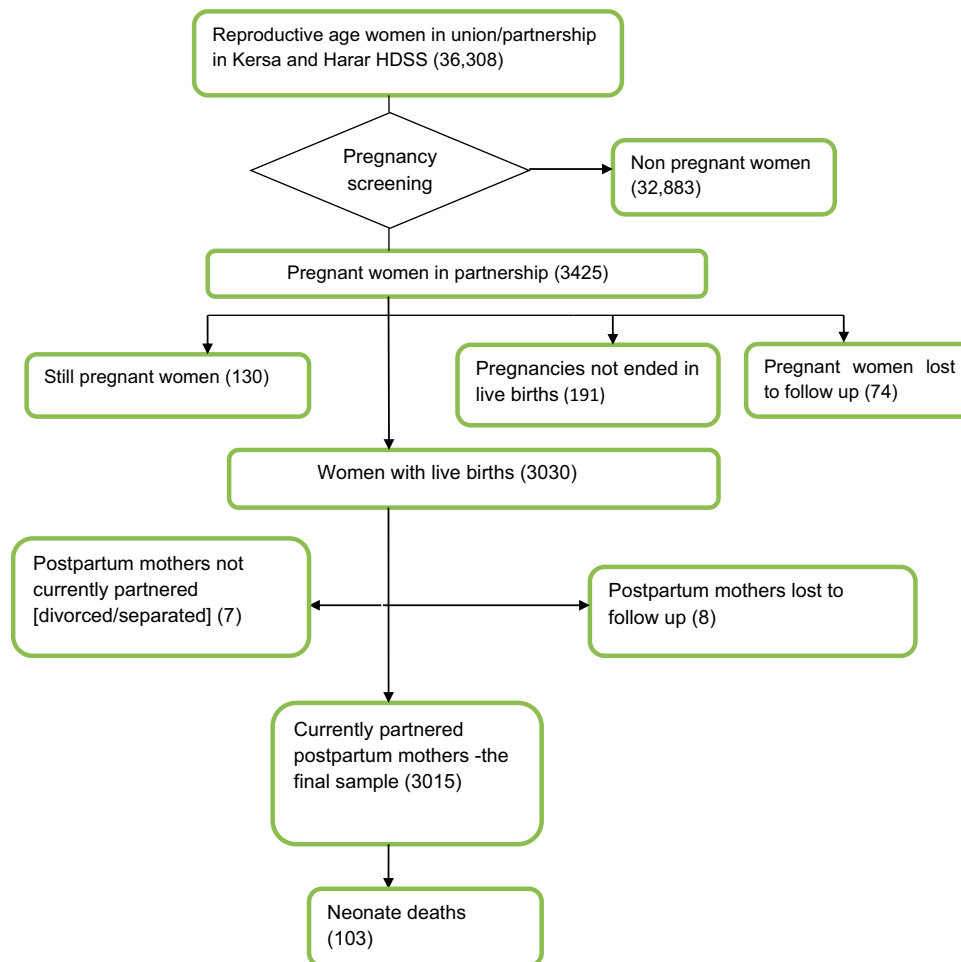


Figure 1 Flow diagram showing identification of study subjects, Eastern Ethiopia, 2018.

week of intensive training based on the WHO's guide for training on domestic violence.⁴² The training was focused on how to administer the questionnaire, ways of addressing questions that could arise during the interview, how to maximize disclosure of violence, and safety and confidentiality. A standard fieldwork manual developed by the WHO for use in studies on violence against women was adopted and used by the research team.⁴³ Before commencement of the main study, the study tool and procedure were pretested in a sample of postpartum women in similar settings outside the study area.

Ethical Approval

This study was conducted following the principles of the Declaration of Helsinki. The Institutional Health Research Ethics Review Committee of Haramaya University, College of Health and Medical Sciences, ethically cleared the study (IHRERC/153/2017, dated October 26, 2017). Written Informed consent was obtained from each participant before the interview. Minor participants (ie, those aged 15–17 years) were asked about their willingness to participate. For those willing to participate, written informed consent was obtained from their parents or legal guardians. Additional assent was then obtained from each of these minor participants. For illiterate participants, a literate witness was involved in the consent process, the participant's fingerprint was taken, and the consent form was signed by the witness and the data collector.

This study followed the WHO ethical and safety recommendation guideline for studies on violence against women.⁴¹ Thus, the study was framed as a women's health, family relationship and life experiences study. However, each participating woman was personally introduced to the specific nature of the study before the interview was conducted (through a participant information and consent acquisition sheet). The interview with each woman was conducted in a private setting and at a preferable time and place for her. The respondent was also allowed to reschedule (or relocate) the interview to a time (or place) that may be safer or more convenient for her. No identifying information was recorded on the questionnaires; instead, a unique code was used to distinguish the questionnaires. Each study subject was informed of the aim and purpose of the study, the risks and benefits of participating in the study, and that her participation was purely voluntary. Confidentiality was maintained throughout the study period.

Variables and Measurement

The experience of IPVP was considered as an outcome variable and assessed using the WHO multi-country study questionnaire.¹¹ It was here defined as a woman's exposure to psychological, physical or sexual violence by her husband/intimate partner during the time of the index pregnancy. Our sample is comprised of mothers currently partnered with the father of the index child, so for the purposes of this study, "intimate partner" refers to the father of the respondent's index child.

Data were collected on three forms of IPVP, ie, physical, sexual and psychological.

An affirmative answer to any one of the following six behaviors constituted physical IPVP: (1) pushing or throwing something at her; (2) slapping; (3) punching or hitting with a fist or something harmful; (4) kicking or dragging her; (5) choking or burning intentionally; or (6) threatening or attacking with a weapon (eg, a knife or gun).

Sexual IPVP was measured by at least one positive response to the following three acts: (1) if the woman reported having been physically forced to have sexual intercourse when she did not want to; (2) when the woman had intercourse out of fear of her husband/partner; or (3) when she was forced to perform other sexual acts that she found degrading or humiliating.

Psychological IPVP was measured by at least one positive response to the following four questions, which asked whether the respondent's husband/partner had: (1) insulted her or made her feel bad about herself; (2) humiliated or belittled her in front of others; (3) scared/intimidated her on purpose; or (4) threatened to hurt her or someone close to her.

Consequently, women who answered "yes" to at least one of the 13 questions above were considered as having "experienced any violence (any/overall IPVP)" and were coded as "1", and women who answered "no" to all of the questions were considered as "no violence experienced" and coded as "0".

Data were also collected on the socio-demographic and pregnancy-related characteristics of each respondent woman and her husband/partner. Education was grouped into no formal education, primary (Grade 1–8), secondary (Grade 9–12) and tertiary level (Grade 12+). Respondent's age was recategorized into 19 years or younger, 20–34 years and 35 years or older. Respondent's working status was categorized as housewife versus working to earn cash, whereas the husband's/partner's working status was

grouped into working and not working. Living arrangement was grouped into living in a separate arrangement or living together with parents/families. The alcohol drinking habits of the woman and her husband/partner during the pregnancy period were classified as frequent drinker, occasional drinker and never drunk alcohol. The husband's/partner's khat-chewing habit was grouped into never or occasional chewer versus habitual (frequent) chewer.

Women's household empowerment was derived from their household decision-making autonomy and their belief in and attitude towards wife-beating.⁴⁴ Household decision making was determined based on the number of household decisions a woman made alone or jointly with her husband/partner about: (1) spending income; (2) obtaining health care for herself; (3) major household purchases; (4) purchases for daily household needs; and (5) visiting family or relatives. The response options were: (a) respondent alone, (b) respondent and husband/partner, (c) husband/partner alone, or (d) others/someone else. Each question was assigned a value of 1 if the response was (a) or (b), and 0 for (c) or (d). Attitude towards wife-beating was measured as a composite index consisting of the following items: a husband/partner is justified in hitting or beating his wife if she (a) is unable to carry household chores, (b) disobeys/argues with him, (c) asks him about his extramarital affairs, (d) is barren, and (e) refuses to have sexual intercourse with him. Each item had a response of "Yes" or "No", and a value of "0" was given if the woman accepted/justified beating and "1" otherwise.

For information related to the index pregnancy, women were asked whether they received ANC or not, their husband's/partner's stance on women's ANC use (discourage, no interest, encourage), whether there was a previous history of infant death, the number of living children and the couple's intention for the index pregnancy (concordant versus discordant intentions). The number of living children was recategorized as three or fewer, four to six, and seven or more children. Intentions regarding the index pregnancy were assessed by asking, "Right before you became pregnant, did you want to become pregnant then, did you want to wait until later, did you not want it at all?" Women were asked the same question about their husband's/partner's intentions of the index pregnancy. The index pregnancy intentions by the women and by their husband/partner were used to construct pregnancy intention discordance status for the couples. Thus, a couple's discordance was defined as a non-match between the woman's and her husband's/partner's intentions (ie, not both "wanted then", both

"wanted later" or both "not wanted"), whereas concordance was defined as a match in the intention of the index pregnancy between the woman and her partner.

Data Management and Analysis

The data were double entered and cleaned using EpiData version 3.1 and analyzed using Stata version 14. A principal component analysis (PCA) was performed to derive the women's household empowerment index using each of the variables representing women's household decision-making autonomy and their belief in/attitude towards wife-beating. The PCA yielded three categories of women's household empowerment: low, medium and high status. In the analysis, the correlation coefficients between the components and original variable were used to understand the structure of latent factors in the model.

A log-binomial regression model was used to assess factors associated with the outcome variable. The log-binomial regression model is an appropriate analytical model for estimating the prevalence ratio (PR) in cross-sectional studies of binary and common outcomes.⁴⁵

Crude prevalence ratios (CPRs) with 95% CIs were estimated to assess the association between each independent variable and the outcome variable. Variables with a *P*-value <0.25 in the bivariate analysis were first considered for multivariable analysis; however, known confounders such as residence, living arrangement and the number of children under 5 years of age that were deemed to be considered were also included in the multivariable model, although they did not reach a *P*-value <0.25. A *P*-value <0.05 was used to declare the level of statistical significance in the multivariable analysis, and adjusted prevalence ratios (APRs) along with 95% CIs were estimated. The log-likelihood ratio test and Akaike's and Bayesian information criteria were used to select the final model. The Pearson chi-squared and Hosmer-Lemeshow goodness-of-fit tests were used to test for model fitness. The explanatory variables were tested for multi-collinearity before entering them into multivariable models using variance inflation factor values of less than 10.

Results

Characteristics of Study Participants

A total of 3015 postpartum women were included in the study. The majority of the participating women were formally married to their partner (2922, 96.9%). The majority

of them were Muslims (88.4%), had no formal education (64.0%) and were housewives (87.9%). Three-quarters of the participants were in the middle age group (20–34 years), the overall age range being 15–44 years with mean \pm standard deviation of 26.4 \pm 5.8 years. A little more than one-quarter (27.3%) stated that they had a living arrangement together with their own or their partner's parents/families. The participants had nearly equal proportions in their household empowerment status of low, medium and high levels. Few of the women (0.7%) or their husbands/partners (3.3%) were frequent alcohol drinkers during the pregnancy period. The majority of the women's husbands/partners (84.6%) were habitual khat chewers. Nearly half (45.8%) of the participants' husbands/partners had no formal education and 54.8% of them encouraged the women's ANC use. Half of the women who participated in the study (50.1%) stated that they had not attended antenatal care (ANC). The majority of the studied women and their husbands/partners (87.9%) had concordant/agreed intentions in the index pregnancy (Table 1).

Prevalence of Intimate Partner Violence During Pregnancy

Among the 3015 study participants, 918 experienced at least one type of violent act during pregnancy (any or overall IPVP), corresponding to a prevalence of 30.5% (95% CI: 28.8, 32.1). Psychological violence was the most common form, with a prevalence of 24.4% (95% CI: 22.9, 26.0), followed by physical (11.9%; 95% CI: 10.8, 13.2) and sexual violence (11.0%; 95% CI: 9.9, 12.2). Of the acts of physical violence, the act of forcefully pushing the pregnant woman was cited as the commonest form of violence, with a prevalence of 7.8% (95% CI: 10.8, 13.2). The commonest form of psychological violence was insulting (23.2%; 95% CI: 21.7, 24.8), whereas physically forcing the pregnant women to have sexual intercourse was reported as the most frequent act of sexual violence, with a prevalence of 10.4% (95% CI: 9.3, 11.6). Of the sexual violence acts, 94.6% (314/332) were in the form of coerced sex. The most frequently overlapping occurrence of IPVP was physical and psychological (9.3%; 95% CI: 8.3, 10.4), followed by psychological and sexual (7.1%; 95% CI: 6.2, 8.1) and physical and sexual IPVP (4.6%; 95% CI: 3.9, 5.4). The joint occurrence of all types of IPVP was 4.0% (95% CI: 3.3, 4.8) (Table 2).

Factors Associated with Intimate Partner Violence During Pregnancy

In the results of bivariate analysis, all forms of IPVP (physical, sexual, psychological and any/overall IPVP) were significantly more prevalent among non-educated women and their husband/partner. On the other hand, the experience of all forms of IPVP was shown to significantly decrease as women advanced in education from primary or secondary to tertiary level. All forms of IPVP tended to be more prevalent among working women and among those with medium to high levels of household empowerment (Tables 3-6).

The bivariate analysis also shows that the prevalence of psychological, physical and any IPVP significantly increased as the women's age advanced (reaching a peak among the age group 35 years and above) and the number of living children increased (reaching a peak among women with seven or more children). Specifically, the CPRs for women aged 35 years and above for psychological, physical and any IPVP were 2.00 (1.46, 2.73; Table 3), 2.15 (1.33, 3.49; Table 4) and 1.49 (1.16, 1.91; Table 6), respectively. The CPRs for women with seven or more children for psychological, physical and any-IPVP were 1.42 (1.16, 1.73; Table 3), 1.59 (1.18, 2.15; Table 4) and 1.19 (1.01, 1.43; Table 6), respectively. Moreover, in this bivariate analysis significant associations were detected between husband's/partner's education, women's working status and the couple's pregnancy intentions with each of the violence types; ie psychological IPVP (Table 3), Physical IPVP (Table 4), sexual IPVP (Table 5) and overall IPVP (Table 6).

In a multivariable analysis, women's education, their working status and having a medium household empowerment level were significantly associated with all forms of IPVP (ie, psychological, physical, sexual and any/overall IPVP). Women who were working were 1.9 times more psychologically abused (APR=1.90; 95% CI: 1.58, 2.28), 2.54 times more physically abused (APR=2.54; 95% CI: 1.89, 3.41), 3.37 times more often victims of sexual IPV (APR=3.37; 95% CI: 2.54, 4.47) and 2.13 times more likely to experience any of these forms of violence during pregnancy (APR=2.13; 95% CI: 1.83, 2.48) compared to housewives. Being educated to tertiary level decreased the PR of psychological abuse by 51% (APR=0.49; 95% CI: 0.31, 0.78), physical abuse by 95% (APR=0.05; 95% CI: 0.01, 0.23), sexual abuse by 80% (APR=0.20; 95% CI: 0.09,

Table 1 Characteristics of Study Participants in Eastern Ethiopia, 2018 (n=3015)

Variable	Variable Category	Number	Percent
Residence	Harar	542	18.0
	Kersa	2473	82.0
Religion	Muslim	2666	88.4
	Orthodox	296	9.8
	Protestant	53	1.8
Age group (years)	<20	333	11.0
	20–34	2284	75.8
	≥35	398	13.2
Age at first marriage (years)	<18	1596	52.9
	≥18	1419	47.1
Marital duration (years)	≤1	303	10.1
	2–4	618	20.5
	5–10	1111	36.8
	>10	983	32.6
Education (women)	No education	1932	64.1
	Primary or secondary	927	30.8
	Tertiary	156	5.1
Education (partner)	No education	1382	45.8
	Primary or secondary	1388	46.0
	Tertiary	245	8.2
Women's household empowerment status	Low	1006	33.4
	Medium	1006	33.4
	High	1003	33.2
Drinking habit (women)	Yes, frequently	22	0.7
	Yes, occasionally	158	5.3
	Not at all	2831	94.0
Drinking habit (partner)	Yes, frequently	98	3.3
	Yes, occasionally	272	9.1
	Not at all	2547	85.1
	Do not know	77	2.5
Khat-chewing habit (partner)	Never/not habitually	464	15.4
	Always/habitually	2551	84.6
Living arrangement	Not with family	2192	72.7
	With family	823	27.3
Working status (women)	Housewife	2650	87.9
	Working	365	12.1
Working status (partner)	Working	2940	97.5
	Not working	75	2.5
Number of children under 5 at home	<3	2647	87.8
	≥3	368	12.2
ANC attendance	Not attended	1511	50.1
	Attended ≥1	1504	49.9

(Continued)

Table 1 (Continued).

Variable	Variable Category	Number	Percent
Partner's stance on ANC use	Discouraged	56	1.9
	No interest	1305	43.3
	Encouraged	1654	54.8
Number of living children	≤3	1867	61.9
	4–6	878	29.1
	≥7	270	9.0
Couple's pregnancy intentions	Concordant	2649	87.9
	Discordant	366	12.1
Previous infant death	No	2475	82.1
	Yes	540	17.9

Abbreviation: ANC, antenatal care.

Table 2 Prevalence of Different Types of Intimate Partner Violence During Pregnancy, Eastern Ethiopia, 2018 (n=3015)

Violent Act/Item	Number	Prevalence, % (95% CI)
Physical (at least one of the six below)	361	11.9 (10.8, 13.2)
Being pushed	234	7.8 (6.8, 8.8)
Being slapped	184	6.1 (5.3, 7.0)
Being punched with fist	115	3.8 (3.2, 4.6)
Being kicked or dragged	23	0.8 (0.5, 1.1)
Being choked or burnt intentionally	11	0.4 (0.2, 0.7)
Being threatened or actually attacked with weapon/knife	17	0.6 (0.3, 0.9)
Psychological (at least one of the four below)	737	24.4 (22.9, 26.0)
Being insulted	700	23.2 (21.7, 24.8)
Being belittled/humiliated	294	9.8 (8.7, 10.9)
Being scared/intimidated on purpose	85	2.8 (2.3, 3.5)
Being threatened to hurt her or someone she cares about	30	1.0 (0.7, 1.4)
Sexual (at least one of the three below)	332	11.0 (9.9, 12.2)
Being physically forced to have sex	314	10.4 (9.3, 11.6)
Had sex when not wanting to because of fear	116	3.9 (3.2, 4.6)
Forced to do something sexual which is humiliating	35	1.2 (0.8, 1.6)
Any (overall) IPVP[†]	918	30.5 (28.8, 32.1)
Overlapping Occurrences*		
Physical and Psychological	281	9.3 (8.3, 10.4)
Physical and Sexual	138	4.6 (3.9, 5.4)
Psychological and Sexual	214	7.1 (6.2, 8.1)
Physical, Psychological and Sexual	121	4.0 (3.3, 4.8)

Notes: *Joint occurrences of physical, psychological and sexual violence during pregnancy. [†]At least one act of the 13 acts of violence comprising physical, sexual and psychological violence.

0.45) and overall abuse by 64% (APR=0.36; 95% CI: 0.24, 0.53) compared to the non-educated women. Women with a medium household empowerment level showed a significant and positive association in the prevalence of all forms of IPVP compared to women with a low level of empowerment (Table 7).

Women's alcohol drinking habit during pregnancy and their experience of infant loss were significantly associated with all forms of IPVP, except for the physical type. Women who had no habit of drinking alcohol experienced 47% less psychological IPVP (APR=0.53; 95% CI: 0.29, 0.99), 75% less sexual IPVP (APR=0.25; 95% CI: 0.12,

Table 3 Bivariate Associations Between Various Factors and Psychological Intimate Partner Violence During Pregnancy, Eastern Ethiopia (n=3015), 2018

Variable	Category	Psychological IPV		CPR (95% CI)	P-value
		Yes, n (%)	No, n(%)		
Residence	Harar	135(24.9)	407(75.1)	1.00	0.781
	Kersa	602(24.3)	1871(75.7)	0.98(0.83,1.15)	
Age group(years)	<20	46(13.8)	287(86.2)	1.00	0.000
	20-34	581(25.4)	1703(74.6)	1.84(1.39,2.43)	
	≥ 35	110(27.6)	288(72.4)	2.00(1.46,2.73)	
Age at first marriage (years)	<18	404(25.3)	1192(74.7)	1.00	0.250
	≥18	333(23.5)	1086(76.5)	0.9(0.81,1.05)	
Marital duration (years)	≤ 1	57(18.8)	246(81.2)	1.00	0.204
	2-4	139(22.5)	479(77.5)	1.2(0.90,1.57)	
	5-10	246(22.1)	865(77.9)	1.1(0.91,1.52)	
	>10	295(30.0)	688(70.0)	1.6(1.23,2.05)	
Education (women)	No formal education	519(26.8)	1413(73.2)	1.00	0.000
	Primary/secondary	194(20.9)	733(79.1)	0.78(0.67,0.90)	
	Tertiary	24(15.4)	132(84.6)	0.57(0.39,0.83)	
Education (partner)	No formal education	375(27.1)	1007(72.9)	1.00	0.008
	Primary/secondary	316(22.8)	1072(77.2)	0.84(0.74,0.96)	
	Tertiary	46(18.8)	199(81.2)	0.69(0.53,0.91)	
Household empowerment status	Low	202(20.1)	804(79.9)	1.00	0.000
	Medium	316(31.4)	690(68.6)	1.56(1.34,1.82)	
	High	219(21.8)	784(78.2)	1.09(0.92,1.29)	
Drinking habit (women)	Yes frequently	7(31.8)	15(68.2)	1.00	0.966
	Yes occasionally	51(32.3)	107(67.7)	1.01(0.53,1.95)	
	Not at all	677(23.9)	2154(76.1)	0.75(0.41,1.39)	
Drinking habit (partner)	Yes frequently	27(27.6)	71(72.4)	1.00	0.618
	Yes occasionally	68(25.0)	204(75.0)	0.91(0.62,1.33)	
	Not at all	600(23.6)	1947(76.4)	0.85(0.62,1.19)	
Khat-chewing habit (partner)	Never/occasional	77(16.6)	387(83.4)	1.00	0.000
	Frequently	660(25.9)	1891(74.1)	1.56(1.26,1.93)	
Working status (women)	Housewife	598(22.6)	2052(77.4)	1.00	0.000
	Working	139(38.1)	226(61.9)	1.7(1.45,1.95)	
Working status (partner)	Working	716(24.4)	2224(75.6)	1.00	0.460
	Non-working	21(28.0)	54(72.0)	1.15(0.80,1.66)	
Living arrangement	Not with family	538(24.5)	1654(75.5)	1.00	0.836
	With family	199(24.2)	624(75.8)	0.99(0.86,1.13)	
Number of children under 5	<3	646(24.4)	2001(75.6)	1.00	0.890
	≥3	91(24.7)	277(75.3)	1.1(0.84,1.23)	
ANC attendance	Not attend	359(23.8)	1152(76.2)	1.00	0.380
	Attended ≥1	378(25.1)	1126(74.9)	1.1(0.93,1.19)	
Partner's stance on ANC use	Discourage	15(26.8)	41(73.2)	1.00	0.668
	No interest	385(29.5)	920(70.5)	1.10(0.71,1.71)	
	Encourage	337(20.4)	1317(79.6)	0.76(0.49,1.18)	

(Continued)

Table 3 (Continued).

Variable	Category	Psychological IPV		CPR (95% CI)	P-value
		Yes, n (%)	No, n(%)		
Number of living children	≤3	404(21.6)	1463(78.4)	1.00	0.000
	4-6	250(28.5)	628(71.5)	1.32(1.15,1.51)	
	≥7	83(30.7)	187(69.3)	1.42(1.16,1.73)	
Couple's pregnancy intentions	Concordant	622(23.5)	2027(76.5)	1.00	0.000
	Discordant	115(31.4)	251(68.6)	1.34(1.13,1.58)	
Previous infant loss	No	617(24.9)	1858(75.1)	1.00	0.190
	Yes	120(22.2)	420(77.8)	0.9(0.75,1.05)	

Abbreviations: IPV, intimate partner violence during pregnancy; CPR, crude prevalence ratio; ANC, antenatal care.

0.57) and 45% less overall IPV (APR=0.55; 95% CI: 0.35, 0.87) compared to women with a frequent habit of alcohol drinking. Women who experienced infant loss reported a lower prevalence of IPV of any type, except for physical IPV (Table 7).

The living arrangements of the couple, woman's age, husband's/partner's khat-chewing habit and the couple's pregnancy intentions were significantly associated with all forms of IPV, except for the sexual type. Women who were living with their or husband's/partner's family showed a decreased PR for psychological abuse by 19% (APR=0.81; 95% CI: 0.69, 0.94), for physical abuse by 27% (APR=0.73; 95% CI: 0.58, 0.94) and for any/overall abuse by 13% (APR=0.87; 95% CI: 0.77, 0.98) compared to women living with their husband/partner alone. Older women experienced twice as much physical IPV, 1.60–1.83 times higher psychological IPV and 1.56 times higher any/overall IPV than younger women, aged less than 20 years. Women whose husband/partner chewed khat frequently and those who had disagreements over the intention of the index pregnancy with their husband/partner showed a higher prevalence of IPV across all types, except for sexual IPV (Table 7).

Women's places of residence were found to be significantly associated with sexual and psychological IPV. Women residing in rural Kersa had significantly lower rates of sexual (APR=0.41; 95% CI: 0.27, 0.60) and psychological IPV (APR=0.68; 95% CI: 0.53, 0.87) compared to their counterparts in the urban Harar area. Compared to women whose husband/partner was engaged in work, women with a non-working husband/partner reported a decreased prevalence of sexual and any/overall IPV (Table 7).

Women whose husband/partner had primary or secondary education were 26% less abused sexually by their husband/partner than women with a non-educated husband/partner (APR=0.74; 95% CI: 0.58, 0.96). Women whose partner encouraged their ANC use also experienced 56% less physical abuse during pregnancy (APR=0.44; 95% CI: 0.25, 0.78) than women who were discouraged from using ANC by their partner (Table 7).

Discussion

The findings from this study revealed that the prevalences of psychological, physical and sexual IPV were 24.4%, 11.9% and 11.0%, respectively. This order of prevalence of IPV is consistent with study reports from Ethiopia¹⁴ and elsewhere.^{46–48} The finding that psychological violence was the most prevalent abusive act in this study may be due to the fact that pregnancy could offer protection against physical violence for many women, and that the decrease in physical violence during the pregnancy period may parallel an increase in psychological violence, as evidenced by the patterns of longitudinal violence prevalence in relation to pregnancy onset in studies from Brazil⁴⁹ and Bangladesh.⁹ Moreover, in this study, the use of the culturally sensitive WHO Violence Against Women questionnaire is considered to increase detection of the emotionally abusive acts of insulting, intimidating and threatening, which might not be culturally considered as acts of violence in many traditional societies. Notably, this study also indicated that the most common co-occurring types of violence during pregnancy were psychological and physical violence. Comparable IPV overlap has been reported in previous studies.^{9,49}

Table 4 Bivariate Associations Between Various Factors and Physical Intimate Partner Violence During Pregnancy, Eastern Ethiopia (n=3015), 2018

Variable	Category	Physical IPV		CPR (95% CI)	P-value
		Yes, n(%)	No, n(%)		
Residence	Harar	50(9.2)	492(90.8)	1.00	0.032
	Kersa	311(12.6)	2162(87.4)	1.36(1.03,1.81)	
Age group(years)	<20	21(6.3)	312(93.7)	1.00	0.002
	20-34	286(12.5)	1998(87.5)	1.98(1.29,3.05)	
	≥ 35	54(13.6)	344(86.4)	2.15(1.33,3.49)	
Age at first marriage (years)	<18	209(13.1)	1387(86.9)	1.00	0.045
	≥18	152(10.7)	1267(89.3)	0.8(0.67,0.99)	
Marital duration (years)	≤ 1	23(7.6)	280(92.4)	1.00	0.094
	2-4	69(11.2)	549(88.8)	1.5(0.94,2.31)	
	5-10	123(11.1)	988(88.9)	1.4(0.95,2.23)	
	>10	146(14.9)	837(85.1)	1.9(1.28,2.97)	
Education (women)	No formal education	283(14.7)	1649(85.3)	1.00	0.000
	Primary/secondary	76(8.2)	851(91.8)	0.56(0.44,0.71)	
	Tertiary	2(1.3)	154(98.7)	0.09(0.02,0.35)	
Education (partner)	No formal education	204(14.8)	1178(85.2)	1.00	0.000
	Primary/secondary	142(10.2)	1246(89.8)	0.69(0.57,0.85)	
	Tertiary	15(6.1)	230(93.9)	0.41(0.25,0.69)	
Household empowerment status	Low	107(10.6)	899(89.4)	1.00	0.000
	Medium	166(16.5)	840(83.5)	1.55(1.23,1.95)	
	High	88(8.8)	915(91.2)	0.82(0.63,1.08)	
Drinking habit (women)	Yes frequently	4(18.2)	18(81.8)	1.00	0.589
	Yes occasionally	22(13.9)	136(86.1)	0.77(0.29,2.02)	
	Not at all	335(11.8)	2496(88.2)	0.65(0.27,1.59)	
Drinking habit (partner)	Yes frequently	9(9.2)	89(90.8)	1.00	0.612
	Yes occasionally	30(11.0)	242(89.0)	1.20(0.59,2.44)	
	Not at all	287(11.3)	2260(88.7)	1.23(0.65,2.31)	
Khat-chewing habit (partner)	Never/occasional	22(4.7)	442(95.3)	1.00	0.000
	Frequently	339(13.3)	2212(86.7)	2.80(1.84,4.26)	
Working status (women)	Housewife	292(11.0)	2358(89.0)	1.00	0.000
	Working	69(18.9)	296(81.1)	1.7(1.35,2.18)	
Working status (partner)	Working	355(12.1)	2585(87.9)	1.00	0.297
	Non-working	6(8.0)	69(92.0)	0.66(0.31,1.44)	
Living arrangement	Not with family	259(11.8)	1933(88.2)	1.00	0.663
	With family	102(12.4)	721(87.6)	1.05(0.85,1.30)	
Number of children under 5	<3	308(11.6)	2339(88.4)	1.00	0.122
	≥3	53(14.4)	315(85.6)	1.2(0.94,1.62)	
ANC attendance	Not attend	179(11.9)	1332(88.1)	1.00	0.830
	Attended ≥1	182(12.1)	1322(87.9)	1.1(0.84,1.24)	
Partner's stance on ANC use	Discourage	10(17.9)	46(82.1)	1.00	0.402
	No interest	182(13.9)	1123(86.1)	0.78(0.44,1.39)	
	Encourage	169(10.2)	1485(89.8)	0.57(0.32,1.02)	

(Continued)

Table 4 (Continued).

Variable	Category	Physical IPVP		CPR (95% CI)	P-value
		Yes, n(%)	No, n(%)		
Number of living children	≤3	191(10.2)	1676(89.8)	1.00	0.002
	4-6	126(14.4)	752(85.6)	1.40(1.14,1.73)	
	≥7	44(16.3)	226(83.7)	1.59(1.18,2.15)	
Couple's pregnancy intentions	Concordant	301(11.4)	2348(88.6)	1.00	0.005
	Discordant	60(16.4)	306(83.6)	1.44(1.11,1.86)	
Previous infant loss	No	301(12.2)	2174(87.8)	1.00	0.498
	Yes	60(11.1)	480(88.9)	0.9(0.70,1.19)	

Abbreviations: IPVP, intimate partner violence during pregnancy; CPR, crude prevalence ratio; ANC, antenatal care.

In this study, the overall prevalence of IPVP was 30.5% (95% CI: 28.8, 32.1). This result is comparable to that found by Yimer et al in Northwest Ethiopia,³¹ indicating a prevalence rate of 32.2% (95% CI: 27.8, 36.5), and to the finding of a 2018 review on IPVP in Ethiopia that demonstrated pooled prevalence estimates of 26.1% (95% CI: 20.0, 32.3).¹⁴ Other community-based studies conducted in Ethiopia²⁹ and Bangladesh,⁵⁰ however, reported a much higher rate of overall IPVP than the findings of this study. This may be because our sample comprised mothers who had given birth very recently (within 6 weeks of delivery), and the excitement of the birth may have led to a lower likelihood of reporting IPV experienced during the index pregnancy.

This study revealed that 94.6% of the sexual violence acts during pregnancy were in the form of coerced sex. This proportion is far greater than in the studies conducted by Yimer et al³¹ and Abate et al,²⁹ where the sexually coercive act was reported at 66.7% and 65.8%, respectively. In Ethiopia, the high prevalence of marital forced sex is largely accounted for by the culturally imposed marital sexual relationship, where there is little or no consideration for the woman's consent to sex and it takes place whenever the man wants it.⁵¹ Sexual violence in the form of forceful sex has severe consequences for the abused pregnant woman as it may lead to gynecological problems including severe injuries, vaginal bleeding or infections.⁵² Such maternal complications are known to lead to pregnancy loss or premature birth, particularly if the forced sex is perpetrated during late pregnancy.⁵³ The consequences of IPV and forced sex during pregnancy on adverse birth outcomes were reported in a 2019 study in Ethiopia.⁵⁴

Women who resided in the rural study area (Kersa district) had a significantly lower prevalence of sexual

IPVP than their urban counterparts (women in Harar). This may be explained by underreporting of sexual abuse in the rural women (compared to urban women) due to the sensitivity of the issue and the surrounding cultural taboos,⁵⁵ although several measures such as securing confidentiality and involving female data collectors were in place in this study. The study also revealed that the rural women experienced less psychological IPVP than the urban women, which may indicate that in rural settings, in contrast to urban areas, acts of psychological violence such as insulting and belittling may not be considered as violence, leading to underreporting of these acts.

Being of an older age was significantly and positively associated with all forms of IPVP, except for sexual violence, which agrees with the findings of previous studies.^{56,57} One explanation for this may be older women reporting cumulatively persisting experiences of partner violence, although the validity of this association needs to be treated cautiously as this study is cross-sectional and asserting a cumulative effect may be difficult. However, other studies reported a reverse association, where middle or older aged women reported less experience of IPVP.^{31,48}

In this study, education of women provided a protective effect against the occurrence of all forms of IPVP, which agrees with studies conducted in low-resource settings.^{47,58,59} This could be attributed to the fact that education can provide women with ample information on their rights and greater negotiating ability with their husband/partner, which helps in changing patriarchal norms and values.⁵⁵

Compared to women living in separate arrangements, women who were living with families (either their own or their husband's/partner's family) had a significantly lower experience of all forms of violence, except for sexual,

Table 5 Bivariate Associations Between Various Factors and Sexual Intimate Partner Violence During Pregnancy, Eastern Ethiopia (n=3015), 2018

Variable	Category	Sexual IPV		CPR (95% CI)	P-value
		Yes, n (%)	No, n(%)		
Residence	Harar	84(15.5)	458(84.5)	1.00	0.000
	Kersa	248(10.0)	2225(90.0)	0.65(0.51,0.81)	
Age group(years)	<20	30(9.0)	303(91.0)	1.00	0.280
	20-34	251(10.9)	2033(89.1)	1.22(0.85,1.75)	
	≥ 35	51(12.8)	347(87.2)	1.42(0.93,2.18)	
Age at first marriage (years)	<18	198(12.4)	1398(87.6)	1.00	0.010
	≥18	134(9.4)	1285(90.6)	0.80(0.62,0.94)	
Marital duration (years)	≤ 1	20(6.6)	283(93.4)	1.00	0.003
	2-4	83(13.4)	535(86.6)	2.1(1.27,3.25)	
	5-10	96(8.6)	1015(91.4)	1.3(0.82,2.08)	
	>10	133(13.5)	850(86.5)	2.1(1.30,3.22)	
Education (women)	No formal education	244(12.6)	1688(87.4)	1.00	0.001
	Primary/secondary	76(8.2)	851(91.8)	0.65(0.51,0.83)	
	Tertiary	12(7.7)	144(92.3)	0.61(0.35,1.06)	
Education (partner)	No formal education	188(13.6)	1194(86.4)	1.00	0.000
	Primary/secondary	117(8.4)	1271(91.6)	0.62(0.49,0.77)	
	Tertiary	27(11.0)	218(89.0)	0.81(0.55,1.18)	
Household empowerment status	Low	69(6.9)	937(93.1)	1.00	0.000
	Medium	183(18.2)	823(81.8)	2.65(2.04,3.45)	
	High	80(7.9)	923(92.1)	1.16(0.85,1.59)	
Drinking habit (women)	Yes frequently	5(22.7)	17(77.3)	1.00	0.995
	Yes occasionally	36(22.8)	122(77.2)	1.01(0.44,2.28)	
	Not at all	291(10.3)	2540(89.7)	0.45(0.21,0.98)	
Drinking habit (partner)	Yes frequently	10(10.2)	88(89.8)	1.00	0.493
	Yes occasionally	35(12.9)	237(87.1)	1.26(0.65,2.45)	
	Not at all	286(11.2)	2261(88.8)	1.10(0.61,2.99)	
Khat-chewing habit (partner)	Never/occasional	53(11.4)	411(88.6)	1.00	0.758
	Frequently	279(10.9)	2272(89.1)	0.96(0.73,1.26)	
Working status (women)	Housewife	208(7.9)	2442(92.1)	1.00	0.000
	Working	124(34.0)	241(66.0)	4.3(3.57,5.25)	
Working status (partner)	Working	323(10.9)	2617(89.1)	1.00	0.781
	Non-working	9(12.0)	66(88.0)	1.09(0.59,2.03)	
Living arrangement	Not with family	196(8.9)	1996(91.1)	1.00	0.000
	With family	136(16.5)	687(83.5)	1.85(1.51,2.27)	
Number of children under 5	<3	295(11.1)	2352(88.9)	1.00	0.533
	≥3	37(10.0)	331(90.0)	0.9(0.65,1.25)	
ANC attendance	Not attend	116(7.7)	1395(92.3)	1.00	0.000
	Attended ≥1	216(14.4)	1288(85.6)	1.8(1.51,2.32)	
Partner's stance on ANC use	Discourage	1(1.8)	55(98.2)	1.00	0.053
	No interest	159(12.2)	1146(87.8)	6.8(0.97,47.9)	
	Encourage	172(10.4)	1482(89.6)	5.8(0.83,40.8)	

(Continued)

Table 5 (Continued).

Variable	Category	Sexual IPV		CPR (95% CI)	P-value
		Yes, n (%)	No, n(%)		
Number of living children	≤3	205(10.9)	1662(89.1)	1.00	0.628 0.249
	4-6	91(10.4)	787(89.6)	0.94(0.75,1.19)	
	≥7	36(13.3)	234(86.7)	1.21(0.87,1.69)	
Couple's pregnancy intentions	Concordant	305(11.5)	2344(88.5)	1.00	0.021
	Discordant	27(7.4)	339(92.6)	0.64(0.44,0.94)	
Previous infant loss	No	288(11.6)	2187(88.4)	1.00	0.021
	Yes	44(8.2)	496(91.8)	0.7(0.52,0.95)	

Abbreviations: IPV, intimate partner violence during pregnancy; CPR, crude prevalence ratio; ANC, antenatal care.

which is in agreement with a study conducted in a district in Oromia regional state of Ethiopia.²⁹ This could be because, if pregnant women are attached to the family and are able to obtain support from them, then their husband's/partner's respect for them may increase and so lower their exposure to violence.⁶⁰

Inconsistent with other studies,^{47,59,61} the findings of this study showed that women who had a medium household empowerment level as well as those working outside the home had a significantly higher experience of all forms of violence from their husband/partner. However, our study findings corroborate study findings from Nigeria.⁶² A possible explanation for this positive association may be that women's confrontation of established male household dominance leads to inconsistencies in male status, thus triggering abuse in order to re-establish power and masculine identity.⁶³⁻⁶⁵ Besides, many men in Ethiopia culturally believe that women exist for household work and men exist to earn an income and are superior.⁵¹

The couple's discordant intentions in the index pregnancy were significantly and positively associated with the prevalence of all forms of IPV, except for sexual. This is in agreement with studies by Pearson et al in Bangladesh⁶⁶ and Shamu et al in Zimbabwe.⁶⁷ It is possible that the pregnancy would trigger an increased risk of violence if it was the result of the woman's lack of reproductive control leading to an unintended pregnancy.⁶⁸ The woman's own decision to become pregnant (without the consent of her husband/partner) may also put her at greater risk of violence, as her decision may be in conflict with her husband's/partner's role as provider in a situation of limited economic resources.⁶⁷

In this study, frequent consumption of alcohol by pregnant women was positively associated with IPV perpetration by the husband/partner against them. This finding is in agreement with other studies in Ethiopia and other

places.^{31,58,69} It may, however, be possible that the pregnant women self-medicated with alcohol as a coping strategy to alleviate the stress and trauma associated with the experience of violence.^{6,70} This bidirectional association warrants further investigation into whether women's consumption of alcohol in pregnancy is more likely to lead to IPV or whether exposure to IPV increases alcohol intake in pregnancy.⁷¹ In this study, frequent khat chewing by the husband/partner contributed to increased exposure of pregnant women to IPV, which may be due to the negative influence of irresponsible behavior due to the khat addiction.³⁴

Inconsistent with prior studies,^{58,69} previous experience of infant death was negatively associated with all forms of IPV. This may be due to cultural reasons related to the husband's/partner's sympathetic and emotionally supportive attitude as a result of the family's loss of an infant.^{6,72}

Strengths and Limitations of the Study

This study has several strengths. The consideration of all forms of violence (psychological, physical, sexual and overall IPV) gives us wider scope to observe which factors were highly associated with which of these IPV types. Moreover, our assessment of IPV from postpartum mothers whose pregnancies had ended very recently could reduce the level of recall bias in the study. The use of PRs estimated by the log-binomial regression model, which is an appropriate statistical method for cross-sectional studies of high outcome prevalence (usually >10%), is another strength of this study. The narrow confidence intervals observed in the results of this study owing to the study's large sample size also show a good precision in the estimated associations of outcome and factor variables.

Table 6 Bivariate Associations Between Various Factors and Overall Intimate Partner Violence During Pregnancy, Eastern Ethiopia (n=3015), 2018

Variable	Category	Overall IPVP		CPR (95% CI)	P-value
		Yes, n (%)	No, n(%)		
Residence	Harar	176(32.5)	366(67.5)	1.00	0.253
	Kersa	742(30.0)	1731(70.0)	0.92(0.81,1.06)	
Age group(years)	<20	72(21.6)	261(78.4)	1.00	0.001
	20-34	718(31.4)	1566(68.6)	1.45(1.17,1.80)	
	≥ 35	128(32.2)	270(67.8)	1.49(1.16,1.91)	
Age at first marriage (years)	<18	517(32.4)	1079(67.6)	1.00	0.014
	≥18	401(28.3)	1018(71.7)	0.9(0.78,0.97)	
Marital duration (years)	≤ 1	75(24.8)	228(75.2)	1.00	0.078
	2-4	188(30.4)	430(69.6)	1.2(0.98,1.55)	
	5-10	310(27.9)	801(72.1)	1.1(0.91,1.40)	
	>10	345(35.1)	638(64.9)	1.4(1.15,1.76)	
Education (women)	No formal education	644(33.3)	1288(66.7)	1.00	0.000
	Primary/secondary	244(26.3)	683(73.7)	0.79(0.69,0.89)	
	Tertiary	30(19.2)	126(80.8)	0.58(0.42,0.80)	
Education (partner)	No formal education	457(33.1)	925(66.9)	1.00	0.011
	Primary/secondary	397(28.6)	991(71.4)	0.86(0.77,0.97)	
	Tertiary	64(26.1)	181(73.9)	0.79(0.63,0.99)	
Household empowerment status	Low	263(26.1)	743(73.9)	1.00	0.000
	Medium	382(37.9)	624(62.1)	1.45(1.27,1.66)	
	High	273(27.2)	730(72.8)	1.04(0.90,1.20)	
Drinking habit (women)	Yes frequently	9(40.9)	13(59.1)	1.00	0.769
	Yes occasionally	70(44.3)	88(55.7)	1.08(0.64,1.84)	
	Not at all	837(29.6)	1994(70.4)	0.72(0.44,1.20)	
Drinking habit (partner)	Yes frequently	32(32.7)	66(67.3)	1.00	0.990
	Yes occasionally	89(32.7)	183(67.3)	1.01(0.72,1.40)	
	Not at all	746(29.3)	1801(70.7)	0.90(0.67,1.20)	
Khat-chewing habit (partner)	Never/occasional	110(23.7)	354(76.3)	1.00	0.001
	Frequently	808(31.7)	1743(68.3)	1.34(1.12,1.58)	
Working status (women)	Housewife	734(27.7)	1916(72.3)	1.00	0.000
	Working	184(50.4)	181(49.6)	1.8(1.62,2.05)	
Working status (partner)	Working	891(30.3)	2049(69.7)	1.00	0.271
	Non-working	27(36.0)	48(64.0)	1.19(0.87,1.62)	
Living arrangement	Not with family	658(30.0)	1534(70.0)	1.00	0.401
	With family	260(31.6)	563(68.4)	1.05(0.93,1.19)	
Number of children under 5	<3	806(30.5)	1841(69.5)	1.00	0.995
	≥3	112(30.4)	256(69.6)	0.9(0.85,1.18)	
ANC attendance	Not attend	416(27.5)	1095(72.5)	1.00	0.001
	Attended ≥1	502(33.4)	1002(66.6)	1.2(1.08,1.35)	
Partner's stance on ANC use	Discourage	18(32.1)	38(67.9)	1.00	0.706
	No interest	452(34.6)	853(65.4)	1.1(0.78,1.59)	
	Encourage	448(27.1)	1206(72.9)	0.8(0.57,1.24)	

(Continued)

Table 6 (Continued).

Variable	Category	Overall IPV		CPR (95% CI)	P-value
		Yes, n (%)	No, n(%)		
Number of living children	≤3	538(28.8)	1329(71.2)	1.00	0.037 0.051
	4-6	287(32.7)	591(67.3)	1.13(1.01,1.28)	
	≥7	93(34.4)	177(65.6)	1.19(1.01,1.43)	
Couple's pregnancy intentions	Concordant	781(29.5)	1868(70.5)	1.00	0.001
	Discordant	137(37.4)	229(62.6)	1.27(1.09,1.47)	
Previous infant loss	No	776(31.4)	1699(68.6)	1.00	0.024
	Yes	142(26.3)	398(73.7)	0.80(0.72,0.98)	

Abbreviations: IPV, intimate partner violence during pregnancy; CPR, crude prevalence ratio; ANC, antenatal care.

Table 7 Adjusted Prevalence Ratio of Factors Associated with Different Forms of Intimate Partner Violence During Pregnancy, Eastern Ethiopia, 2018

Variable	Category	APR (95% CI)			
		Psychological IPV	Physical IPV	Sexual IPV	Overall IPV
Residence	Harar (urban)	1	1	1	1
	Kersa (rural)	0.68 (0.53, 0.87)*	0.81 (0.54, 1.22)	0.41 (0.27, 0.60)*	0.85 (0.87, 1.03)
Age group (years)	<20	1	1	1	1
	20–34	1.83 (1.34, 2.49)*	2.00 (1.25, 3.18)*	1.08 (0.75, 1.56)	1.56 (1.23, 1.98)*
	≥35	1.60 (1.10, 2.33)*	1.60 (0.89, 2.86)	0.90 (0.55, 1.46)	1.37 (1.02, 1.84)
Age at first marriage (years)	<18	1	1	1	1
	≥18	0.99 (0.86, 1.13)	1.05 (0.85, 1.29)	0.98 (0.77, 1.23)	0.94 (0.84, 1.05)
Education (women)	No formal education	1	1	1	1
	Primary/secondary	0.83 (0.70, 0.99)*	0.55 (0.41, 0.74)*	0.46 (0.34, 0.64)*	0.77 (0.66, 0.89)*
	Tertiary	0.49 (0.31, 0.78)*	0.05 (0.01, 0.23)*	0.20 (0.09, 0.45)*	0.36 (0.24, 0.53)*
Education (partner)	No formal	1	1	1	1
	Primary/secondary	0.98 (0.84, 1.13)	0.96 (0.76, 1.20)	0.74 (0.58, 0.96)*	0.92 (0.82, 1.03)
	Tertiary	0.86 (0.61, 1.19)	1.13 (0.64, 1.98)	0.94 (0.53, 1.68)	0.98 (0.75, 1.28)
Marital duration (years)	≤1	1	1	1	1
	2–4	0.93 (0.71, 1.23)	0.99 (0.63, 1.56)	1.59 (0.98, 2.56)	1.02 (0.81, 1.28)
	5–10	0.76 (0.57, 1.01)	0.77 (0.48, 1.21)	1.10 (0.67, 1.80)	0.78 (0.62, 1.00)
	>10	0.97 (0.71, 1.31)	0.99 (0.60, 1.63)	1.55 (0.92, 2.61)	0.92 (0.72, 1.19)
Household empowerment status	Low	1	1	1	1
	Medium	1.41 (1.20, 1.65)*	1.40 (1.10, 1.76)*	1.80 (1.39, 2.35)*	1.29 (1.13, 1.47)*
	High	0.99 (0.84, 1.19)	0.85 (0.65, 1.11)	0.95 (0.68, 1.32)	0.95 (0.82, 1.10)
Drinking habit (women)	Yes, frequently	1	1	1	1
	Yes, occasionally	0.77 (0.41, 1.43)	1.15 (0.47, 2.83)	0.66 (0.28, 1.56)	0.89 (0.55, 1.44)
	Not at all	0.53 (0.29, 0.99)*	0.61 (0.29, 1.32)	0.25 (0.12, 0.57)*	0.55 (0.35, 0.87)*
Drinking habit (partner)	Yes, frequently	1	1	1	1
	Yes, occasionally	0.95 (0.65, 1.40)	1.54 (0.75, 3.16)	0.68 (0.33, 1.38)	0.90 (0.65, 1.25)
	Not at all	0.75 (0.55, 1.03)	0.98 (0.53, 1.82)	1.02 (0.55, 1.92)	0.77 (0.58, 1.01)

(Continued)

Table 7 (Continued).

Variable	Category	APR (95% CI)			
		Psychological IPVP	Physical IPVP	Sexual IPVP	Overall IPVP
Working status (women)	Housewife				
	Working	1.90 (1.58, 2.28)*	2.54 (1.89, 3.41)*	3.37 (2.54, 4.47)*	2.13 (1.83, 2.48)*
Working status (partner)	Working				
	Not working	0.80 (0.56, 1.14)	0.47 (0.22, 1.02)	0.46 (0.22, 0.97)*	0.65 (0.49, 0.86)*
Khat-chewing habit (partner)	Never/not habitually				
	Always/habitually	2.05 (1.59, 2.67)*	3.15 (1.97, 5.03)*	1.47 (0.98, 2.18)	1.72 (1.41, 2.11)*
Living arrangement	Not with family/parent				
	With family/parents	0.81 (0.69, 0.94)*	0.73 (0.58, 0.94)*	0.93 (0.74, 1.17)	0.87 (0.77, 0.98)*
Number of children under 5	<3				
	≥3	0.90 (0.74, 1.10)	1.09 (0.82, 1.44)	1.15 (0.84, 1.56)	0.98 (0.83, 1.15)
ANC attendance	Not attended				
	Attended ≥1	1.12 (0.95, 1.31)	1.15 (0.90, 1.46)	1.22 (0.94, 1.57)	1.25 (1.09, 1.42)*
Partner's stance on ANC use	Discouraged				
	No interest	1.13 (0.76, 1.66)	0.52 (0.29, 0.92)*	4.90 (0.66, 36.4)	0.89 (0.61, 1.30)
	Encouraged	0.80 (0.55, 1.16)	0.44 (0.25, 0.78)*	4.34 (0.58, 32.2)	0.68 (0.47, 1.00)
Number of living children	≤3				
	4–6	1.12 (0.93, 1.34)	1.05 (0.80, 1.39)	0.77 (0.58, 1.03)	1.04 (0.90, 1.20)
	≥7	1.19 (0.89, 1.57)	1.10 (0.73, 1.77)	0.96 (0.64, 1.44)	1.05 (0.85, 1.29)
Couple's pregnancy intentions	Concordant				
	Discordant	1.19 (1.01, 1.40)*	1.29 (1.01, 1.66)*	0.71 (0.49, 1.04)	1.19 (1.03, 1.36)*
Previous infant loss	No				
	Yes	0.82 (0.68, 0.98)*	0.79 (0.60, 1.03)	0.67 (0.51, 0.89)*	0.82 (0.71, 0.96)*

Note: *Significant at $P<0.05$.

Abbreviations: APR, adjusted prevalence ratio; IPVP, intimate partner violence during pregnancy; ANC, antenatal care.

The study also has some limitations. The cross-sectional nature of the study makes it difficult to establish a temporal relationship between predictor and outcome variables. We also relied on self-report of potentially stigmatizing information, such as women's alcohol consumption habits during the index pregnancy and their exposure to sexual violence, which could potentially bias their responses and lead to underreporting. Moreover, there may be a reporting bias due to using women as proxy respondents regarding their husband's/partner's pregnancy intentions towards the index pregnancy.

Implications for Clinical Practice and Future Research

The findings of this study have implications for public health policy, clinical practice and future research. As

a high proportion of women experienced IPVP, early intervention through screening of IPV in the ANC setting as well during home visits is imperative. Moreover, the high proportion of acts of sexual violence during pregnancy being in the form of forceful sex (94.6%) signals the seriousness of the problem to the women's reproductive health and calls for the integration of information and education on IPVP into the existing maternal health programs in Ethiopia. Most importantly, given the high prevalence of IPVP in Ethiopia¹⁴ and its adverse effects on the mother and fetus/newborn,^{21,54} the findings of this study should contribute towards the development of national policy in the protection of pregnant women against IPV. Future longitudinal studies could investigate patterns in the prevalence of IPV around the time of pregnancy to provide better information on the risk factors of IPVP.

Conclusion

All forms of IPVP are widely prevalent in the study area, with psychological violence being the leading type, followed by physical and sexual violence. Nearly one-third (30.5%) of studied women had experienced at least one type of IPVP. Psychological and physical violence were the most common overlapping forms of IPVP. An enormously high proportion of sexual violence acts during pregnancy (94.6%) was in the form of forceful sex. The women's educational level, working condition and household decision-making autonomy (empowerment), place of residence, living arrangement, alcohol intake during the index pregnancy and age; their husband's/partner's stance on women's ANC use, khat-chewing habits and working conditions; and the couple's pregnancy intentions were positively or negatively associated with the varying forms of IPVP.

More efforts are needed towards early screening for IPV and the integration of IPV information in maternal health-care programs to tackle the prevalent IPVP in the study area. Specific protective measures, including the promotion of women's higher education and sensitization on IPVP through the dissemination of relevant sensitization tools, are also paramount. Such actions increase the women's and the community's awareness about the consequences of various forms of IPVP and could contribute towards changing gender-inequitable norms, beliefs and practices in the community. To this end, urgent attention at all levels of societal organization, involving different stakeholders working on women's rights, policy makers and other concerned bodies, is duly needed.

Abbreviations

ANC, antenatal care; APR, adjusted prevalence ratio; CI, confidence interval; CPR, crude prevalence ratio; HDSS, health and demographic surveillance system; IPVP, intimate partner violence in/during pregnancy; PR, prevalence ratio; WHO, World Health Organization.

Data Sharing Statement

All data analyzed for this article are available from the corresponding author and can be obtained on reasonable request.

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Author Contributions

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

Disclosure

The authors declare that they have no conflicts of interest.

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