Abstract

Aim: In this study, we aimed to assess the incidence of postpartum depression, factors affecting the development of postpartum depression and to make a detailed analysis of intimate partner violence (IPV) during pregnancy and its effects on postpartum depression. Material and Method: This study enrolled 220 participants who were 2-6 months in puerperium period. The sociodemographic features of the participants and the levels of physical, economic, sexual, and psychological IPV exposed during pregnancy were rated using Edinburgh Postpartum Depression Scale (EPDS) that determines the risk of postpartum depression. A p-value less than 0.05 was considered statistically significant. Results: The mean age of 220 participants was 30.84±6.032 years. Thirty-five (15.9%) participants scored 13 or higher in the EPDS score; these 35 participants were considered to have postpartum depression (PPD). There was a significant difference between the EPDS scores by the educational levels of the partners (p<0.05). EPDS score was affected significantly by having a delivery under urgent conditions, developing any infantile complication during delivery, physical and psychological IPV had a significant effect on EPDS (p<0.05). Marriage age and educational level had a significant correlation with physical IPV (p<0.05). Discussion: PPD is a highly prevalent disorder that adversely affects the quality of life of a mother, infant, and all family members. Mothers in the postpartum period should be more closely followed and PPD must be questioned in family health centers.

Keywords
Postpartum Depression; Violence in Pregnancy; Intimate Partner Violence; Edinburgh Postpartum Depression Scale
Introduction
Pregnancy and postpartum period are risky periods for psychological disorders to arise. In the postpartum period, intra-familial communication problems and various crisis periods may occur due to various causes including infant care [1] Non-psychotic depression of the postpartum period is the most common complication after delivery [2]. It usually starts 15-20 days after delivery and in 80% of cases it starts within 1.5 months after delivery. It has a prevalence of 6% to 16% and an incidence of 10% to 15% [3]. The most common etiology of postpartum depression is a history of depression prior to gestation or anxiety. Additionally, problems associated with infant care, problems with partner and marriage, and low socioeconomic status also triggers postpartum depression [2]. The symptoms of postpartum depression are usually similar to those of major depression [4]. Postpartum depression is not only a problem for mother, but also for infant and other family members. Materno-fetal relation is severely impaired by postpartum depression. Maternal depression also impairs the emotional bond with the infant, which worsens mother’s sense of guilt [5]. Severe postpartum depression may be easily overlooked, that is why its early diagnosis is of vital importance [6]. The Edinburgh Postpartum Depression Scale (EPDS) is a scale developed to rate depression risk following delivery [7].

Intimate partner violence (IPV) is an important public health problem that disproportionately affects women. IPV may be in many forms including physical violence, sexual violence, and psychological violence. About 40% of women in the United States are subjected to sexual violence and about 20% become victims of physical violence. IPV has a profound impact on a woman's physical and emotional wellbeing. IPV may lead to consequences as severe as mental disturbances, increased depression risk, anxiety, post-traumatic stress disorder, and suicide [8,9]. Many studies to date have focused on the risks of IPV in pregnancy [10,11].

This study aimed to assess the prevalence of postpartum depression and possible risk factors for its development. It also assessed in detail various types of IPV and determined their impact on EPDS.

Material and Method
This study was approved by the clinical research local ethics committee (2018-319-13). It was designed and conducted as a cross-sectional analytic study. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants. The study was conducted at our Family Health Center in Eskişehir, in Turkey in an attempt to determine the prevalence of postpartum depression and the effects of possible risk factors and IPV episodes during pregnancy on its occurrence. It was performed by enrolling 220 participants who were willing to participate in the study. The study included mothers without any psychiatric disorder diagnosed in the prenatal period, who had given a live birth 2-6 months earlier. Two forms were prepared to record data during the study period. The first form was prepared by us to determine sociodemographic properties of enrolled mothers. The second form is the Edinburgh Postpartum Depression Scale (EPDS) form to rate the risk of postpartum depression. EPDS is a kind of self-rating scale. The lowest possible score attainable from the scale is 0 and the highest 30. The participants with a total score of 13 or higher were considered as the risk group [7]. Mothers deemed to be at risk (those with an EPDS score of 13 or higher) were informed accordingly and referred to psychiatry clinics.

Age, the number of the current pregnancy, comorbidities, history of consanguineous marriage, marriage age, marriage duration, economic and educational level, occupational status, spouse's educational and occupational levels, single vs multiple fetuses, urgency of delivery, fetal complication in delivery, maternal complication in delivery, history of stillbirth, history of spontaneous abortus, use of assistive reproductive techniques, status of regular medical controls in pregnancy, smoking, alcohol, or drug use in pregnancy, comorbidities during pregnancy, exposure to physical, psychological, economic, and sexual IPV in pregnancy, antidepressant use in pregnancy, history of postpartum depression, history of infantile gas pains/colic, infant's feeding pattern (breastfeeding status), family history of psychiatric disease, and presence of domestic assistive personnel for infant care were questioned.

Data analysis was performed with SPSS vs 18 for Windows. The scores were expressed as mean ± standard deviation (SD). Statistical analyses were performed using the Chi-Square test and the one-way Anova test. Risk analyses were performed. Reliability analysis was performed by calculating Cronbach’s Alpha value. A p-value of p<0.05 was considered statistically significant.

Results
This study included 220 mothers at 2-6 months postpartum period who had a mean age of 30.84±6.052 (min: 21, max: 54) years. The mean EPDS score was 6.07±6.932 (min: 0- max: 24). Thirty-five (16%) participants had an EPDS score of 13 or higher. The reliability of the study was performed by calculating the Cronbach's Alpha value, which was found 0.938 (>0.7) indicating the study was reliable. The current pregnancy was the first in 90 (40.9%) patients; second in 65 (29.5%) patients; third in 30 (13.6%); fourth in 20 (9.1%); fifth in 6 (2.3%); and eighth in 4 (1.8%). Furthermore, 210 (95.5%) participants had a single fetus and 10 (4.5%) had multiple fetuses in their last pregnancy. Multiple fetuses and increased number of pregnancies caused a significant increase in the total EPDS score (p=0.038, p<0.05), (p=0.000, p<0.05).

Participants’ economic level was categorized as low, moderate, and high. Fifteen (6.8%) patients had a low economic level; 200 (90.9%) patients had moderate economic level; and 5 (5%) patients had a high economic level. All (100%) 35 patients who had an EPDS score of 13 or higher had a moderate-income level. No significant difference could be found between EPDS level by economic status (p=0.072, p>0.05) (Table 1). Sixty (27.3%) patients were primary school graduates; 80 (36.4%) were high school graduates; and 80 (36.4%) were college graduates. No significant difference existed between EPDS levels by economic level (p=0.286, p>0.05) (Table 1).

Fifty (22.7%) spouses were primary school graduates; 95 (43.2%) high school graduates; and 75 (34.1%) college graduates. A significant difference existed between EPDS levels by spouse’s educational level (p=0.000, p<0.05) (Table 1). The mothers with primary school graduate spouses had significantly different EPDS compared with mothers with high school graduate spouses, (p<0.001, p<0.05). The mothers with primary school graduate spouses had no significantly different
No significant difference was observed in the EPDS score by comorbidity status (p=0.063, p>0.05) (Table 2). Thirty (13.6%) patients delivered under urgent conditions. There were significant differences between the EPDS scores by urgency of delivery (p=0.000, p<0.05), (OR: 1.352, 95% (0.361, 5.060)) (Table 2). Mothers having urgent delivery had a higher EPDS score. Fifteen (6.8%) patients had experienced an infant complication. There was a significant difference between the EPDS scores by delivery complications (p=0.000, p<0.05), (OR: 1.352, 95% (0.361, 5.060)) (Table 2).

There were 16 (7.3%) participants who had been fertilized with assisted reproduction techniques (OR: 0.802, 95% (0.173, 3.720)), 26 (11.8%) participants who had health problems in pregnancy (OR: 1.008, 95% (0.324, 3.138)), 94 (42.7%) participants who had gas-colic pain in pregnancy (OR: 0.742, 95% (0.352, 1.563)), and 134 (60.9%) participants who had assistance for infant care (OR: 1.249, 95% (0.586, 2.665)). No significant EPDS differences were seen with fertilization with assisted reproduction techniques, presence of health problems in pregnancy, presence of gas-colic pain in pregnancy, and having assistance for infant care (p=0.142, p>0.05) (Table 2).

The rate of attending regular controls in pregnancy was 95.5% (n=210); the rate of antidepressant use in pregnancy was 3.67% (n=7); and the rate of having a history of documented depression in the previous pregnancy was 2.3% (n=5). No significant differences were observed between EPDS scores, attending regular controls during pregnancy (OR: 0.746, 95% (0.152, 3.670)), antidepressant use (OR: 1.331, 95% (0.144, 12.275))
and the history of depression in the previous pregnancy (OR: 1.341, 95% CI (0.154, 12.321)) (p=0.142, p>0.05), (p=0.076, p>0.05), (p=0.053, p>0.05) (Table 2). Furthermore, smoking during pregnancy was found at 18.2% (n=40). There were significant differences between EPDS scores by smoking in pregnancy (p=0.000, p<0.05) (Table 2).

Our study also evaluated IPV types subjected during pregnancy. IPV during pregnancy was categorized into four groups as follows: physical, psychological, economic, and sexual. Of mothers participating in the study, 6.4% (n=14) stated that they had been subjected to physical IPV at least once. Twenty-six (11.8%) participants had been subjected to psychological IPV, 15 (6.8%) economic IPV, and 2 (0.9%) sexual IPV at least once during pregnancy. Statistically, there was a significant effect of physical IPV (OR: 1.784, 95% CI (0.181, 17.666)) and psychological IPV (OR: 0.407, 95% CI (0.092, 1.805)) on EPDS (p=0.000, p<0.05), (p=0.021, p<0.05). However, no significance existed between economic IPV (OR: 0.802, 95% CI (0.173, 3.720)) and sexual IPV (OR: 1.011, 95% CI (0.996, 1.026)) and EPDS (p=0.064, p>0.05), (p=0.056, p>0.05) (Table 3).

The relationship of psychological, economic, sexual, and physical violence with marriage age, marriage duration, economic status, own educational level, partner’s educational level, and smoking were shown in Table 4 and 5. There was a significant relationship between marriage age and educational level and physical IPV (p=0.014, p<0.05), (p=0.038, p<0.05) (Table 5).

Discussion

This study assessed the effects of physical, sexual, economic, and psychological IPV against women and sociodemographic properties on postpartum depression in Turkey. Our study was a prospective cross-sectional study. Studies in the published literature on IPV typically involve patients aged 15-50 years who are in the first six months of puerperium [12,13]. We enrolled 220 participants at postpartum 2-6th months. The age range was 21-34 years. The incidence of postpartum depression varies greatly, at 35.2%, 13.6%, and 45.7%, respectively [12,14,15]. PPD prevalence has been shown to vary between 3.5% and 63.3% in Asian countries [16]. However, there seems to be a consistency between numbers of studies performed in various developing countries. PPD prevalence was reported 38.3% in Pakistan, 33.2% in Turkey, 33% in Vietnam, 33% in Zimbabwe, and 27.9% in Brazil [12]. In central and eastern provinces of Turkey, PPD prevalence is reported as 27-28%. In a study from the capital city of Turkey, Ankara, the prevalence was found as 15% [6]. We report a PPD prevalence of 15.9%, which, although similar to what has been reported in other domestic studies, is much lower than prevalences reported from foreign countries. Advanced maternal age, history of stillbirth, difficulties of infant care, being deprived of any assistant for infant care, and lack of social support are all important factors for the development of postpartum depression [17]. In a domestic study, maternal age reportedly exerted no effect on the PPD prevalence. Furthermore, studies from the Netherlands and Nigeria corroborated this finding [6]. In contrast, another study from Turkey reported that maternal age had a significant effect on PPD prevalence [18]. Our study, on the other hand, showed that although marriage age and duration did not affect PPD prevalence, advanced maternal age did. Although several studies have refuted that socioeconomic status does not influence the incidence of PPD, others have indicated an inverse increase in PPD prevalence to income level [18-20]. Our study failed to demonstrate any relationship between income level and PPD. Studies assessing PPD rate by maternal occupational status, however, provided controversial information. Some studies have concluded significant results, but some others have refuted such an effect [21,22]. Our study, on the other hand, demonstrated no relationship between

<table>
<thead>
<tr>
<th>Intimate Partner Violence</th>
<th>Psychological violence</th>
<th>Economic violence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Physical violence during pregnancy</td>
<td>14%</td>
<td>87</td>
</tr>
<tr>
<td>Psychological violence during pregnancy</td>
<td>26%</td>
<td>133</td>
</tr>
<tr>
<td>Economic violence during pregnancy</td>
<td>15%</td>
<td>87</td>
</tr>
<tr>
<td>Sexual violence during pregnancy</td>
<td>2%</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 3. Intimate partner violence during pregnancy and its association to Edinburgh Postpartum Depression Score (EPDS) (p-value)
Partner violence and postpartum depression

Table 5. The characteristics of the participants' age of marriage, length of marriage, the economic status, educational level, partner's educational level and smoking and their relation with physical and sexual intimate violence during pregnancy (p-value).

<table>
<thead>
<tr>
<th>Age of marriage</th>
<th>Sexual violence Yes</th>
<th>No</th>
<th>p</th>
<th>Physical violence Yes</th>
<th>No</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 years and under</td>
<td>1</td>
<td>54</td>
<td>0.691</td>
<td>1</td>
<td>8</td>
<td>0.014</td>
</tr>
<tr>
<td>21-30 years</td>
<td>0.7% 97.5%</td>
<td>149</td>
<td>0.177</td>
<td>0.2% 99.8%</td>
<td>1</td>
<td>0.055</td>
</tr>
<tr>
<td>31 years and older</td>
<td>0</td>
<td>15</td>
<td>0.0</td>
<td>0% 100%</td>
<td>0</td>
<td>0.274</td>
</tr>
<tr>
<td>1-2 years</td>
<td>0</td>
<td>50</td>
<td>0.019</td>
<td>0% 100%</td>
<td>0</td>
<td>0.038</td>
</tr>
<tr>
<td>2-5 years</td>
<td>5% 97.5%</td>
<td>78</td>
<td>0.024</td>
<td>2.5% 97.5%</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>More than 5 years</td>
<td>0</td>
<td>90</td>
<td>0.86</td>
<td>0% 100%</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>Low</td>
<td>1</td>
<td>14</td>
<td>0.14</td>
<td>0% 100%</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>Middle</td>
<td>6.7% 93.3%</td>
<td>199</td>
<td>0.058</td>
<td>0.5% 99.5%</td>
<td>1</td>
<td>0.074</td>
</tr>
<tr>
<td>High</td>
<td>0</td>
<td>15</td>
<td>0.188</td>
<td>0% 100%</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>Primary education</td>
<td>1.7%</td>
<td>15</td>
<td>0.054</td>
<td>0% 100%</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>High school</td>
<td>1.3% 98.8%</td>
<td>79</td>
<td>0.024</td>
<td>1% 99.8%</td>
<td>1</td>
<td>0.05</td>
</tr>
<tr>
<td>University</td>
<td>0</td>
<td>80</td>
<td>0.25</td>
<td>0% 100%</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>Primary education</td>
<td>2%</td>
<td>14</td>
<td>0.79</td>
<td>0% 100%</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>High school</td>
<td>0% 100%</td>
<td>95</td>
<td>0.05</td>
<td>0% 100%</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>University</td>
<td>1.3% 98.7%</td>
<td>74</td>
<td>0.024</td>
<td>1% 99.8%</td>
<td>1</td>
<td>0.05</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>40</td>
<td>0.25</td>
<td>0% 100%</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>No</td>
<td>1.1% 98.9%</td>
<td>178</td>
<td>0.028</td>
<td>1% 99.8%</td>
<td>1</td>
<td>0.05</td>
</tr>
</tbody>
</table>

maternal occupational status and PPD. Moreover, it has been shown that an increase in the number of deliveries caused an increase in PPD prevalence [6,23]. We similarly determined a parallel increase in PPD prevalence to an increase in the number of pregnancies. A history of PPD in the previous pregnancies, having another psychiatric disorder, or antidepressant use during pregnancy is known to increase PPD incidence [23]. However, our study found no link between PPD and having a history of depression or antidepressant use. This suggests that our results stemmed from low prevalence of antidepressant use or PPD history.

IPV at pregnancy is a growing problem and remains a social issue. Our study is the first to investigate the relationship between economic, physical, and sexual IPV during pregnancy and EPDS in Turkey. A prior study has reported that 35.2% of all pregnant subjects were exposed to physical IPV, 18.5% sexual IPV, and some 65% psychological IPV [13]. Another study reported that 8.8% of the participants were subjected to sexual IPV and 12.2% to physical IPV [14]. A study from Turkey reported that pregnant women were most commonly subjected to physical (11.5%), verbal (31.4%), emotional (22.9%), sexual (12.7%), and economic (9.3%) IPV [24]. However, this study did not clarify the relationship between IPV types and EPDS scores. We demonstrated a prevalence of 6.4% for physical IPV, 11.8% for psychological IPV, 6.8 for economic IPV, and 0.9% for sexual IPV. Our findings were somewhat lower than previously reported.

Domestic studies from Turkey have indicated that the percentage of pregnant subjects exposed to spouse's physical IPV ranged between 8.1% and 36.4% [24]. These domestic studies have been conducted in a cross-sectional manner in different regions of the country. We performed our study in the Central Anatolian Region of Turkey. Its results indicate that IPV is still a social problem. The prevalence of psychological IPV has been reported by domestic studies between 26.7% and 53.6% [25]. Our study showed a psychological IPV rate of 1.8% during pregnancy. Studies on economic IPV at pregnancy revealed the exposure rates of 28.2%, 29.3%, and 9.3%, respectively [24]. Our study, on the other hand, revealed an economic IPV rate of 6.8%. Studies on sexual IPV at pregnancy revealed the exposure rates of 5.4%, 36.4%, and 10% [24]. We determined a sexual IPV rate of 0.9%. Furthermore, we revealed that physical and psychological IPV had significant effects on EPDS. A former study reported that smoking during pregnancy and educational level were the risk factors for physical violence during pregnancy while unplanned pregnancy, living in rural area, and the spouse's low educational level were determined as the risk factors for emotional IPV. Moreover, smoking is also regarded as a risk factor for sexual IPV at pregnancy [25]. In our study, we found no effect of smoking on exposure to various IPV types. Nevertheless, we revealed the significant impact of educational level on physical IPV (p=0.038, p<0.05).

Our study had some limitations. We assessed the EPDS scores of our participants only once. Different studies may rate EPDS scores in the same individuals at second, fourth, and sixth months. We also assessed the effect of different IPV types on EPDS during pregnancy. EPDS may be reassessed at postpartum second, fourth, and sixth months in the same individuals to clearly determine the relationship between IPV types and EPDS. In conclusion, postpartum depression is a highly prevalent disorder that adversely affects the quality of life of mother, infant and the whole family. Mothers at the postpartum period should be more closely followed and carefully questioned about PPD. Additionally, assessments about IPV during pregnancy may help us both make an early diagnosis and treatment and provide a healthier and safer environment for both mother and infant.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No ani-
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Conflict of interest
None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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