

Maternal and Neonatal Complications Following Domestic Violence during Pregnancy

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ABSTRACT

Background: Violence during pregnancy negatively affects women and might lead to pregnancy complications or adverse birth outcomes. An understanding of the relationship between violence during pregnancy and adverse maternal conditions and birth outcomes could have important clinical and public health implications. The study aims to determine factors influencing domestic violence and their effects on pregnancy in terms of maternal and neonatal outcomes.

Materials and Methods: This descriptive-analytical study was conducted on 528 pregnant women referring to the clinic in Jahrom in Honaree Clinic, Jahrom, Iran, between April and December 2017. The study data were collected through questionnaires including the demographic characteristic. Besides, the form of partner violence in pregnancy, including emotional, physical, and sexual violence, was assessed using a validated questionnaire. In addition, a check list was used to measure maternal and neonatal outcomes. Determining maternal outcomes including: hypertension, diabetes, vaginal bleeding during pregnancy, etc., and neonatal outcomes including: Weight, premature birth, fetal distress during labor, etc. Finally, SPSS 16 was used for statistical analysis, the data were analyzed by descriptive statistics, differences between variables were determined by the χ^2 test, and multivariate logistic regression. $P < 0.05$ was considered significant.

Result: The indicate of physical, sexual and emotional domestic violence was respectively 16.4%, 18.6% and 44.4% and the most important risk factors for violence were blood pressure (OR=8.92, 95%, CI=5.22-15.26, $p < 0.001$), Preterm labor pain (OR=3.31, 95%, CI=1.99-5.51, $p < 0.001$), Vaginal bleeding (OR=2.23, 95%, CI=1.46-3.39, $p < 0.001$). Also preterm birth and low birth weight, and infant hospitalization in ICU have increased in women who have been subjected to violence in comparison to those who were not.

Conclusions: The results indicated that the Indicate of violence in pregnant women is relatively high and due to the effects of violence on maternal and neonatal outcomes, the screening programs should be conducted in health centres to identify violence abused pregnant women to prevent adverse effects on the mother and fetus.

Key words: Domestic violence, Maternal, Abuse, Women, Pregnancy

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INTRODUCTION

Domestic violence is a global problem that is observed in many countries and in all social and socio-economic classes. Domestic violence against women includes three types: physical, sexual and emotional abuse, and is perpetrated by family members [1]. It is now known as one of the most important health priorities [2]. Pregnancy can be affected due to various reasons such as moving to a parental role and imbalance of couples' calmness and a change in the previous communication pattern [3],

reduced sexual relationship, misconceptions about pregnancy and feeling unwell of the spouse about pregnancy affects the prevalence of domestic violence and may reduce or exacerbate it [4]. Therefore pregnancy is a unique period of vulnerability [5]. Since this phenomenon causes adverse consequences for both mother and baby during pregnancy, it has attracted much attention [6,7]. Pregnancy alone imposes great physical and psychological pressure on the individual and therefore its accompaniment with other stressors such as violence and can have adverse effects on the fetus and mother including insufficient maternal weight gain in pregnancy, increasing chance of trauma, inadequate care during pregnancy and low weight which increases the mortality of mothers and babies [8,9]. Not only domestic violence is considered as a

major public health problem for women, but is also known as a hidden epidemic [10] which is considered as an additional threat to the mother and the embryo [11]. The prevalence of domestic violence against pregnant women in developing countries is about 4%-28% [12]. In Iran, the average domestic violence against pregnant women have been reported to be more than 60% [13], but only 3% of the pregnant women who have experienced violence are recognized by healthcare staffs [14]. In terms of cultural and social differences of our country, awareness of the extent and severity of domestic violence against women during pregnancy is very important [3]. However, all studies in Iran have dealt with the prevalence of this phenomenon and only few predictive studies have examined the scrutiny of this phenomenon and its impact on the baby and mother. This study aimed to determine the types of domestic violence against women and its impact on maternal and neonatal outcomes.

MATERIALS AND METHODS

This descriptive-analytical study was conducted on 528 pregnant women referring to the clinic in Jahrom in a two-stage sampling for 9 months. The study was approved by ethics committee of Jahrom University of Medical Sciences. Written informed consent was obtained from participants in the sample. Inclusion criteria included: pregnant women with Iranian nationality, aging 15 years-40 years in the last month of pregnancy. Lack of a known psycho-physical disease under treatment, being married and having a living husband at the time of sampling and non-addiction to alcohol, drugs and smoking were considered. In case the mother was eligible to participate in the study and was accepting, she was entering the study as a sample. By providing a confidential environment and adequate explanations about the purpose of the study, a questionnaire of violence was completed by the candidates. Literate people completed the questionnaire themselves and illiterate participants were assisted by interviewers to complete the forms. The interviewers were native graduated midwives who had passed sufficient training courses on the sensitivity of the questions, listening to the candidates and the way of completing the questionnaire. After collecting the data, the candidates were classified in two groups of women subjected to violence (abused) and women not subjected to violence (non-abused). Then the mother's phone number and one of her relatives were recorded for following up. Considering that Motahari maternity hospital in Jahrom was the only maternity hospital in the city, all samples were only referring to this hospital for giving birth; therefore we didn't have the problem of losing the sample after giving birth. All cases of mothers and the fetus were recorded in the mother's folder on the delivery day and the researcher was looking in the folders after visiting the archives of the hospital and having the name of the samples and was writing the maternal and neonatal side effects.

In this study, 555 pregnant women were studied during the first stage of sampling and during the follow-up procedure, 27 patients were excluded due to incomplete questionnaires and the statistical analyses were conducted on two groups of abused and non-abused. The candidates of the two groups were matched according to age, age at marriage, duration of marriage, age of husbands, marital status (compulsory, optional), number of children, number of pregnancies and gestational age.

Data was collected using a questionnaire which includes the following sections: 1. The demographic data which included age, education, occupation, 2. Determining maternal outcomes including: hypertension, diabetes, vaginal bleeding during pregnancy, prenatal care, caesarean, abortion, preterm delivery, preterm rupture of the PROM, and neonatal outcomes including: weight, premature birth, Fetal distress during labor, determining the Apgar score, 3. The questionnaire was evaluating violence During pregnancy in three areas of physical, physiological and sexual abuse. In this questionnaire, physical, sexual, and emotional violence were evaluated by 12, 9, and 15 questions, respectively. Additionally, the number of violence cases was determined using a 7-option Likert scale (never, once, twice, 3-5 times, 6-10 times, 11-20 times, and more than 20 times). This questionnaire was adopted from the one used by Amini [15], Faramarzi et al. [16], Hasheminasab [17], Kazemi [18] and Salehi et al. [19] in the National Survey of Domestic Violence in Iran. Then, the content validity of the questionnaire was approved by some related experts. Besides, using Cronbach's alpha method, the reliability of the questionnaire was obtained as 81% [15,19]. In order to determine the rate of domestic violence, the proportion of abused women; i.e., those providing at least one positive response to the questions related to physical, sexual, and psychological screening, to the whole study population was calculated [15-19]. The questionnaire consists of three domains of violence: Physical, sexual and emotional. Physical domain of this questionnaire includes: slapping, kicking, boxing, pulling the hair, pinching the ear, Stretching on the floor, throwing sharp object to the body, throwing non sharp object to the body, pushing, tying hands and feet, trying to strangle, biting, burning the organ. Sexual domain of this questionnaire include: sexual intercourse without consent of woman, initiate the sexual intercourse after verbal threats, physical abuse to continue the sexual relationship, sexual intercourse after threatening by a tool, interrupting the sexual relationship without female satisfaction, physical abuse during sexual relationship, continuing the sexual intercourse without female consent, applying force to continue the sexual relationship, and emotional domain includes: vilification, mocking and derision, lying, shouting, huffing, threatening to beat, rejecting, preventing from visiting family, financial restriction, deprivation of wearing the favourite cloths, deprivation of affection and attention, Irresponsibility towards children, having ban on watching television, threatening to kill, threatening to imprison at home.

Statistical analyses

Descriptive statistics were used to summarize the demographic profile of the sample. Chi-squared tests were undertaken to compare demographic characteristics between not pregnant women for violence and without violence. We used logistic regression to calculate ORs and 95% CIs to estimate the association between violence during pregnancy, maternal conditions and birth outcomes. The dependent variables in each of the respective models were maternal morbidity (Blood pressure, vaginal bleeding, diabetes, Preterm labor pain, Abortion, delayed prenatal care, Pre-labor rupture of membranes) and birth outcomes (Preterm birth, low birth weight, Fetal distress during labor, admission to the

neonatal intensive care unit). All statistical analyses were performed in the SPSS version 16 and $p < 0.05$ was considered significant.

RESULTS

The results indicated that the overall prevalence of violence against pregnant women in the study population was 51.9% which was respectively including forms of violence were 48% psychological, 15% physical and 33.3% for emotional abuse, also psychological violence was more common than other forms of abuse. Sociodemographic characteristics of violence abused and non-abused women are mentioned in Table 1 respectively.

Table 1: Demographic variables in experience of violence and no experience of violence

Characteristics	No experience of violence (N=254)	Experience of violence (N=274)	p-values
	Mean \pm SD or n (%)		
Age	26.40 \pm 4.93	26.25 \pm 4.38	0.63
Husband's age	31.80 \pm 5.87	30.55 \pm 6.90	
Marital age	20.90 \pm 4.04	20.78 \pm 3.66	
Duration of marriage	5.57 \pm 4.30	5.62 \pm 4.13	0.51
Location			
Rural	73 (28.7)	78 (28.5)	
Urban	181 (71.3)	196 (71.5)	
Educational level			0.017
Uneducated	10 (3.9)	1 (0.7)	
Primary school	64 (25.2)	52 (19)	
Secondary school	97 (38.2)	112 (40.9)	
College or University	83 (32.7)	108 (39.4)	
Husband's Educational level			0.70
Uneducated	10 (3.9)	9 (3.3)	
Primary school	79 (31.1)	87 (31.8)	
Secondary school	96 (37.8)	114 (41.6)	
College or University	69 (27.2)	64 (23.4)	
Employment status			0.31
Housewife	217 (85.4)	239 (87.2)	
Employed	37 (14.6)	35 (12.8)	
Husband Employment status			0.40
Unemployment	199 (78.3)	218 (79.6)	
Employed	55 (21.7)	35 (12.8)	

p-values from chi-squared tests

Risk of adverse maternal outcomes

As shown in Table 2, exposure to violence during pregnancy was associated with increase in the risk of maternal complications. These complications included Blood pressure, Diabetes, Vaginal bleeding (placental previa or abruption), Preterm labor pain, Abortion,

Caesarean delivery, delayed prenatal care. After adjustment for confounding factors, the following maternal conditions leading to hospitalizations were found to be associated with reporting violence during pregnancy: High blood pressure (OR, 8.92; 95% CI, 5.22-15.26), vaginal bleeding (OR, 2.23; 95% CI,

1.46-3.39), diabetes (OR, 1.45; 95% CI, 0.96-2.19), Preterm labor pain (OR, 3.31; 95% CI, 1.99-5.51) and Miscarriage (OR, 2.24; 95% CI, 1.30-3.83), delayed prenatal care (OR, 1.64; 95% CI, 1.15-2.35), Pre-labor

rupture of membranes (OR, 1.75; 95% CI, 1.10-2.80). We found that women who experienced violence during pregnancy were 1.6 times more likely to deliver by caesarean.

Table 2: Association between maternal morbidity and violence during pregnancy

Complications	Violence (n=274)	Without violence (n=254)	OR† (95%, CI)	p-value
Blood pressure	111 (40.50)	18 (7.1)	8.92 (5.22-15.26)	0.001
Diabetes	72 (26.3)	50 (19.7)	1.45 (0.96-2.19)	0.07
Vaginal bleeding (placental previa or abruption)	84 (30.7)	42 (16.5)	2.23 (1.46-3.39)	0.001
Preterm labor pain	68 (24.8)	23 (9.1)	3.31 (1.99-5.51)	0.001
Abortion	48 (17.5)	22 (8.7)	2.24 (1.30-3.83)	0.003
Caesarean delivery	56 (20.4)	35 (13.8)	1.60 (1.01-2.55)	0.04
Delayed prenatal care	118 (43.1)	80 (31.5)	1.64 (1.15-2.35)	0.006
Pre-labor rupture of membranes	57 (20.8)	33 (13)	1.75 (1.10-2.80)	0.018

Abbreviations: OR: Odds Ratio; CI: Confidence Interval

p-value: multivariable logistic regression for adverse maternal outcomes among pregnant women

Risk of adverse fetal outcomes

As shown in Table 3, the risk of adverse fetal outcomes, which included low birth weight, Preterm birth, Fetal distress during labor, admission to the neonatal intensive care unit. Abused women encountered more adverse birth outcomes than of non-abused women. We found that women who experienced violence during pregnancy were 1.58 times more likely to give Preterm birth. Abused women experienced low birth weight and fetal distress during labor and admission to the neonatal intensive care unit 1.49, 0.93 and 1.28 times more than non-abused women.

Table 3: Association between neonatal complications and violence during pregnancy

Group	Violence (n=274)	Without violence (n=254)	OR† (95%, CI)
Low birth weight	50 (18.2)	33 (13)	1.49 (0.92-2.40)
Preterm birth	51 (18.6)	32 (12.6)	1.58 (0.98-2.56)
Fatal distress during labor	140 (51.1)	134 (52.8)	0.93 (0.66-1.31)
Admission to the neonatal intensive care unit	79 (28.8)	61 (24)	1.28 (0.86-1.89)

DISCUSSION

Domestic violence is the most common type of violence against women which occurs at any time of women's life and affects their health and welfare and the fetus inside their body. The prevalence of violence during pregnancy was 51% in Jahrom which is close to the national average (60%) [13]. Studies in Pakistan and India respectively report a violence prevalence of 34% and 41% in pregnancy [20,21]. It was 19% in Tabriz and 35.7% in

Tehran [22,23]. Power domination of men over women and girls, acceptance of violence by women as a way to solve the problems, the dependence of women on men, laws relating to divorce, child custody and inheritance, lack of equality between men and women according to the law and the lack of legal proceedings to violence in cases brought by women are among the causes of violence against them [24].

The results of this study indicate that exposure to violence is associated with a sharp increase in maternal and fetal complications. In this study, a significant association was observed between domestic violence in pregnancy and blood pressure and diabetes which was consistent with the findings of the study conducted by Arcos et al. [25]. Sanchez et al. in the study on 339 pregnant women with preeclampsia and 337 pregnant women with normal blood pressure in Peru concluded that violence by the sexual partner is associated with an increased risk of preeclampsia, so that psychological violence is associated with a 2.3-fold increased risk of preeclampsia and in case of the combination of physical and psychological violence it reaches a 9.1-fold increased risk of preeclampsia [26].

The results indicated that there is a significant association between violence against the pregnant women and maternal outcomes including vaginal bleeding and the preterm rupture of the membrane (PROM). In order to confirm the results of the studies [16,27-29] they also stated that violence against women in pregnancy, increase the incidence of these adverse effects.

Also according to the results, violence during pregnancy is associated with an increased rate of abortion. A study conducted by Arcos et al. confirmed the findings of the recent studies [25]. Violence could establish effective and adverse pregnancy outcome in a direct way (trauma to the abdomen). Because according to the studies, physical

trauma caused by the violence, has been the second leading cause of trauma to pregnant women after traffic accidents. Violence can also be caused through psychological stress or denial of access to medical services in an indirect way and cause adverse pregnancy outcomes [30].

The results indicated that violence causes PROM. The studies conducted by Faramarzi *et al.* [30] and El Kady *et al.* [28] suggest that beating women in pregnancy is associated with an increased rate of PROM.

The results indicated that there is a significant statistical association between violence and the type of delivery so that caesarean in women subjected to violence is 1.4-fold more than women not subjected to violence. In a study by Soleimani *et al.* in Iran [31] and the study by Rachana *et al.* in Saudi Arabia [32] cesarean rates and fetal distress was high in women subjected to spouse abuse.

The results indicate a significant positive association between violence and delay in referring for prenatal care, which is consistent with the similar studies [33,34]. In this study, women who were subjected to more violence were benefited less prenatal care. These findings are consistent with the results of the study conducted by Bodaghabadi [8], Dolatian *et al.* [13] and Koski *et al.* [35] who indicated that women subjected to violence are not sufficiently benefitted from prenatal care because of the lack of adequate support from the husbands. Lack of receiving adequate quantitative and qualitative prenatal care has a significant effect on weight gain during pregnancy and gestational age of the fetus [22]. The studies by Khodakarami *et al.* [11], Sattarzadeh *et al.* [22] and Yang *et al.* [36] defined violence as an independent factor for the inadequate weight gain of the mother during pregnancy. The study conducted by Moraes *et al.* also indicated that violence is effective on feeding, even taking iron and folic acid tablets and as a result, the rate of weight gain of mothers and ultimately, weight and length at the time of birth [37].

In this study, low birth weight, preterm delivery and fetal hospitalization in ICU ward, in abused women were 1.4, 1.5 and 1.2 times higher than women who were not abused. In a study conducted by Behnam *et al.* [3], an inverse association was observed between birth weight with the psychological violence, physical violence and the total score of violence. In the study by Ansari *et al.* [38] and a study conducted by Hasheminasab [17], no difference was observed between the average birth weight in abused and non-abused women. Audi *et al.* indicated a difference between violence and low birth weight and preterm delivery [39]. Dolatian *et al.* believes that the vasoconstriction caused by the activation of the pituitary, adrenal and sympathetic which consequently occur after violence, may decrease uterine-placental blood flow which results in hypoxia and therefore intrauterine growth limitation and low birth weight [13]. The study conducted by Records indicated that abuse, both through physical and sexual trauma and through releasing stress hormones can lead to preterm labor and low birth weight [40]. But in the study conducted by

Leung *et al.* in China, such an association was not observed [41]. The results of Neggers *et al.* showed that physical violence during pregnancy increased low birth weight 1.8 times and premature delivery 1.6 times [42] also Sanchez *et al.* reported that violence among pregnant women is common and is associated with an increased risk of spontaneous preterm birth by 4.8 times [43].

However, these differences could be due to racial differences, differences in violence and frequency of violence in different cultures. Pregnancy alone imposes great physical and psychological pressures on mothers and of course, its cooperation with other stressors such as violence can cause adverse effects on the fetus. Although medical and environmental factors are related with preterm birth and low birth weight of the babies, but according to some studies, abuse during pregnancy can also affect the occurrence of these disorders through different mechanisms.

CONCLUSION

The results of the study indicated that domestic violence, the psychological type is common during pregnancy and is related with the adverse outcomes of pregnancy (maternal and neonatal). According to the results of this study, by conducting the educational program in about risk factors and side effects of violence on baby and mother health, also involvement of husbands in these programs in health centres, an efficient step could be taken in order to reduce the adverse effect of this phenomenon on mothers' health.

LIMITATIONS

- To avoid answering questions from participants, questionnaires were provided without a name, so there was no disruption in data collection.
- Excessive violence report by the samples, were among the limitations of the study which could significantly associated factors of violence with maternal and neonatal outcomes. Although, a full explanation was provided to the volunteers at the beginning of the present study.
- Also other factors, including cultural, economic and social factors have an adverse effect on the occurrence of neonatal outcomes, such as death, low birth weight and preterm delivery of the fetus. So, the observed difference on low birth rate and preterm delivery, the fetal distress among the abused or non-abused women may not only be a result of violence which is out of the researcher's control.

RECOMMENDATIONS

Further research could be conducted to determine other relevant variables with violence outbreak in experience of violence pregnant and no-experience of violence pregnant women in different parts of the country. So that by identifying the risk factors of violence and its consequences and effects on pregnant women, the screening programs are adjusted to identify pregnant

women and this screening is a part of the routine cares during pregnancy.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article.

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