# Effect of Domestic Violence on the Health-related Quality of Life of Pregnant Women During the COVID-19 Pandemic

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The purpose of this study is to clarify the reality of domestic violence among pregnant women during the coronavirus disease 2019 (COVID-19) pandemic and its impact on their quality of life. This cross-sectional study was conducted from June 30 to November 30, 2021. Pregnant women could access our anonymous self-administered questionnaire via a QR code. Domestic violence was assessed using the Violence Against Women Screen (VAWS) instrument. The quality of life and health were evaluated using the Japanese version of the 12-item Short Form Survey (SF-12). Of the 303 pregnant women enrolled in this study, 62 (20.5%) suffered from domestic violence. In VAWS, psychological violence was the most common type at a low score, whereas physiological violence gradually became noticeable as the score increased. The frequency of women planning to continue working after delivery was significantly higher in the group without domestic violence than in the group with domestic violence. Domestic violence influenced the physical functioning of women's quality of life, although other areas of the quality of life showed no significant differences. Furthermore, the VAWS score did not correlate with the scores of any area of SF-12. Domestic violence in pregnant women during the COVID-19 pandemic began silently without physical aggression and gradually progressed to actions with greater intensity. A system that early detects psychological violence and supports pregnant women for violence prevention must be established.

Key words : COVID-19, Domestic violence, Pregnancy, Quality of life

### Introduction

Domestic violence (DV) has become a worldwide problem that threatens women's human rights and health. The World Health Organization (WHO) defines DV as any violent and gender-dependent behavior causing physical, sexual, and/or emotional damage or suffering for women. Approximately 30% of women worldwide suffer from DV by their partners<sup>1)</sup>.

The recent coronavirus disease 2019 (COVID-19) pandemic was severe and concerning. During the outbreak, long-term quarantine and distancing were recommended to protect vulnerable persons and prevent infection spread<sup>2</sup>. The prevention measure could lead to social isolation and limited communication with others, resulting in feelings of discomfort, anxiety, panic, anger, resentment, despair, and  $DV^{3)}$ . The incidence of DV increased in response to stay-at-home or lockdown orders during the pandemic<sup>4</sup>.

Pregnancy itself also places mental and physical stress on women. When pregnant women are stressed

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by other factors, such as violence, these factors can further affect not only the health of these women but also that of their fetus. DV during pregnancy results in various adverse outcomes, including uterine rupture, preterm delivery, maternal death and perinatal death, placental abruption, preterm, and low-birth-weight newborns<sup>5)</sup>. Satin reviewed more than 5700 female sexual assault victims and reported that 2% of them were pregnant<sup>6)</sup>. In addition to attention to physical injuries, exposure to sexually transmitted disease must be considered in sexual assault<sup>7)</sup>.

The issue of quality of life (QOL) in pregnant women exposed to DV is crucial. However, according to the WHO's definition, QOL is a subjective concept that cannot be perceived by others<sup>8)</sup>. Meanwhile, some studies used a scale such as the Short Form Health Survey to assess the relationship between DV during pregnancy and QOL. Given that culture, lifestyle, and living environment influence QOL, the impact of DV on the QOL of pregnant women should be evaluated in each country. Additionally, relationship between DV and QOL under the COVID-19 pandemic is rarely reported. Thus, this study aimed to clarify the reality of DV in pregnant women by their partners and the impact of DV on women's health-related QOL.

# Methods

This cross-sectional study, which was conducted from June 30 to November 30, 2021, enrolled pregnant women residing in Miyazaki City, the central city of Miyazaki Prefecture with a population of 400,000, an annual birth of 3000, and total fertility rate of 1.65.

Flyers containing research description and a QR code were distributed to five private obstetrical clinics and municipal offices distributing Maternal and Child Health handbooks. Pregnant women could access our anonymous self-administered questionnaire via the QR code. The questionnaire survey required the participants' age, number of births, marital status, family members living with them, employment status and type, plans to continue employment, abuse by a partner, and health status.

DV during pregnancy was assessed using Violence Against Women Screen (VAWS), a questionnaire developed by Kataoka et al.<sup>8)</sup>. There are three factors: physical violence, psychological violence, and sexual violence. This questionnaire consists of seven items (4 items of psychological violence, 1 item of sexual violence, and 2 items of physical violence). The VAWS is scored using a 3 point Likert scale (0 = none, 1 = sometimes and 2 = often; for physical violence, 0 = none, 2 = sometimes, and 3 = often). The total scores ranged 0–16; a score of 2 or higher indicates positive.

Health and QOL were assessed using the Japanese version of the 12-item Short Form Survey (SF-12). The SF-12, which was designed by Ware et al.<sup>9)</sup>, is a shorter variant of the 36-item QOL questionnaire. This scale has 12 items capturing the following eight areas: physical functioning, social functioning, physical role constraints, emotional role constraints, psychological health, joy, physical pain, and general health. Considering the low number of items, the total score for each person is normally used. Participants' score in each area varies between 0 and 100, with higher scores representing a better QOL.

#### Ethics Approval and Consent to Participate

This study was conducted in accordance with the guidelines of the Declaration of Helsinki and was approved by the Ethics Committee of the Faculty of Medicine, University of Miyazaki, Miyazaki, Japan (approval number: O-0938). Consent to participate in the study was confirmed by pressing the consent button before answering the questionnaire. Study participation was voluntary, and confidentiality was maintained by anonymous completion of the questionnaires.

#### Statistical Analysis

Between-group comparisons were conducted using the Mann-Whitney U test, chi-square, or Fisher's exact test. The strength of the linear relationship between two quantitative variables was measured using Pearson's correlation coefficient. A *p*-value of < 0.05 was considered statically significant. All statistical data were analyzed using the SPSS software for Windows, version 22 (IBM SPSS Statistic, Tokyo, Japan).

#### Results

This study enrolled 303 pregnant women. Table 1 presents their characteristics. Of these pregnant women, six were unmarried. Of the 297 married pregnant women, 284 (95.6%) had nuclear families. Additionally,

Table 1 Characteristics of pregnant women according to the result of VAWS (n = 303)

	All	positive (n = $62$ )	negative (n = $241$ )	<i>p</i> -value
Age	$31.1 \pm 4.6$	$31.9 \pm 4.8$	$30.9 \pm 4.6$	0.135
< 20	3 (1.0)	0 (0)	3 (1.2)	
20-24	16 (5.3)	4 (6.5)	12 (5.0)	
25-29	96 (31.7)	15 (24.2)	81 (33.6)	
30-34	115 (38.0)	23 (37.1)	92 (38.2)	
35-39	61 (20.1)	17 (27.4)	44 (18.3)	
$40 \leq$	12 (4.0)	3 (4.8)	9 (3.7)	
Primipara	129 (42.6)	20 (32.3)	109 (45.2)	0.065
Married	297	60 (96.8)	237 (98.3)	0.606
Employed	226 (74.6)	48 (77.4)	178 (73.9)	0.566
Full-time employed	171 (56.4)	28 (58.3)	143 (80.3)	0.002

\*VAWS ; Violence Against Women Screen

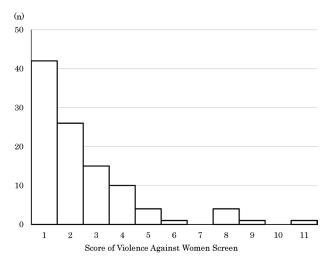


Figure 1 Number of pregnant women according to the score of Violence Against Women Screen

226 were employed, and 207 of them planned to continue working after birth. Of the 77 unemployed pregnant women, 75 were housewives and two were students.

**Fig. 1** shows the number of pregnant women according to the score (1–11) of VAWS. Total scores ranged between 0 and 11 points. DV was found in 62 (20.5%) pregnant women when surveyed on VAWS.

On the basis of the VAWS scores, the pregnant women were divided into positive- and negative-VAWS groups (n = 62 and 241, respectively). **Table 1** also shows the characteristics of these groups. The negative-VAWS group had more women who were employed full time than the positive-VAWS group. Among the employed women (48 in the positive group and 178 in the negative group), the number of women planning to continue working after delivery was higher in the negative-VAWS group (n = 167, 93.8%) than in the positive-VAWS group (n = 40, 83.3%) (p = 0.035).

Table 2, 3 and 4 shows the distribution of pregnant women according to the scores obtained in each violence category in VAWS. Pregnant women experiencing psychological or sexual violence scored 1–11 points, and those experiencing physical violence scored 3–11 points. Notably, in the negative-VAWS group, 42 (17.4%) had one of the VAWS categories. Among them, 34 (81.0%) experienced psychological violence, and the remaining eight experienced sexual violence.

The aggregated point for each VAWS score (0-11 points) was calculated by multiplying the VAWS score by the number of pregnant women who indicated that score. For example, there were 10 pregnant women with VAWS scores of 4. Accordingly, aggregated point was 40 (VAWS score of  $4 \times 10$ ). The distribution of pregnant women who experience psychological violence was 4 in the point of 2, 3 in the point of 3, and 3 in the point of 4. The total points in VAWS score 4 were 29 (the point of  $2 \times 4$  + the point of  $3 \times 3$  + the point of  $4 \times 3$ ). Therefore, the percentage of the total points in psychological item for the aggregated point was 72.5%  $(29/40 \times 100)$ . Similarly, distribution of pregnant women with sexual violence was 6 in the point of 0, 3 in the point of 1, and 1 in the point of 2. Total points with VAWS scores of 4 were 5 (the point of  $1 \times 3$  + the point of  $2 \times 1$ ). Therefore, the percentage of total point in sexual violence for the aggregated point was 12.5% (5/40  $\times$  100). Furthermore, the distribution of

		Psychological violence (point; 0-8)								
		0	1	2	3	4	5	6	7	8
	0 (n = 199)	199								
	1 (n = 42)	8	34							
	2 (n = 26)	1	7	18						
	3 (n = 15)	0	1	2	12					
VAWS*	4 (n = 10)	0	0	4	3	3				
11110	5 (n = 4)	0	0	1	1	2	0			
	6 (n = 1)	0	0	1	0	0	0	0		
	8 (n = 4)	0	0	0	0	0	0	3	0	1
	9 (n = 1)	0	0	1	0	0	0	0	0	0
	11 (n = 1)	0	0	0	0	0	1	0	0	0

Table 2 Percentage of total point of psychological violence in each VAWS Score

\*VAWS score is the sum of the respective category scores.

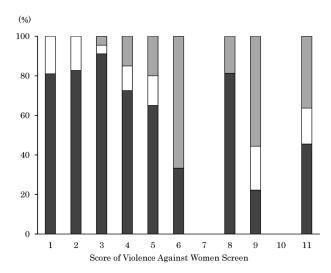


Figure 2 Percentage of the total score for each violence item in the aggregated point black bar; psychological violence, white bar; sexual violence, gray bar; physical violence

pregnant women with physiological violence was 7 in the point of 0 and 3 in the point of 2. The total point of this item with VAWS score of 4 was 6 (the point of 2  $\times$  3). Thus, the percentage of the total point in physiological violence for the aggregated point was 15% (6/40  $\times$  100). The percentage of the total point for each violence item (psychological, sexual, or physical violence) in the aggregated point is shown in Fig. 2. The psychological violence was dominant at the lower VAWS score. At the VAWS score of 2, the total point for the psychological item accounted for 82.7% of the aggregated point. One the other hand, the total point for the physical violence item accounted for 4.4% of the aggregated point at the VAWS score of 3, but at the

Table 3	Percentage of total point of sexual violence in each
	VAWS Score

	Sexual v	iolence (p	oint ; 0-2)	
-		0	1	2
-	0 (n = 199)	199		
	1 (n = 42)	34	8	
VAWS*	2 (n = 26)	18	7	1
	3 (n = 15)	13	2	0
	4 (n = 10)	6	3	1
	5 (n = 4)	1	3	0
	6 (n = 1)	1	0	0
	8 (n = 4)	4	0	0
	9 (n = 1)	0	0	1
	11 (n = 1)	0	0	1

\*VAWS score is the sum of the respective category scores.

VAWS scores of  $\geq$  4, it was 15%–67%. Additionally, the sexual violence was observed even in lower score.

**Table 5** shows the scores of QOL according to the VAWS results. The score for physical functioning was statistically lower in the positive-VAWS group than in the negative-VAWS group (p = 0.038). Although other areas showed no statistically difference between the two groups, all scores in the positive-VAWS group were lower than those in the negative-VAWS group. The total score of VAWS did not correlate with the physical (r = -0.066, p = 0.255), mental (r = -0.044, p = 0.444), or role/social (r = -0.1, p = 0.084) component summary scores.

### Discussion

This study showed that approximately 20% of pregnant women suffered from DV during the COVID-19

		Physical violence (point; 0-6)							
		0	1	2	3	4	5	6	
	0 (n = 199)	199							
	1 (n = 42)	42	0						
	2 (n = 26)	26	0	0					
VAWS*	3 (n = 15)	14	0	1	0				
	4 (n = 10)	7	0	3	0	0			
	5 (n = 4)	2	0	2	0	0	0		
	6 (n = 1)	0	0	0	0	1	0	0	
	8 (n = 4)	1	0	3	0	0	0	0	
	9 (n = 1)	0	0	0	0	0	1	0	
	11 (n = 1)	0	0	0	0	1	0	0	

 Table 4
 Percentage of total point of physical violence in each VAWS Score

\*VAWS score is the sum of the respective category scores.

Table 5 Score of health-related quality of life accoridng to the result of Violence Against Women Screen

		VAWS*				
	All (n = 303)	positive $(n = 62)$	negative $(n = 241)$	<i>p</i> -value		
Physical functioning	45.1 ± 11.5	$42.5 \pm 11.7$	$45.7 \pm 11.4$	0.039		
Physical role	$37.5 \pm 10.5$	$35.8 \pm 10.0$	$37.9 \pm 10.6$	0.120		
Bodily pain	$43.5 \pm 12.0$	$42.7 \pm 11.9$	$43.7 \pm 12.0$	0.525		
General health	$53.6 \pm 8.5$	$53.3 \pm 7.7$	$53.7 \pm 8.7$	0.563		
Vitality	$51.7 \pm 8.5$	$50.5 \pm 7.9$	$52.0 \pm 8.7$	0.130		
Social functioning	$48.1 \pm 11.1$	$46.8 \pm 11.0$	$48.4 \pm 11.1$	0.216		
Emotional role	$43.9 \pm 10.5$	$42.0 \pm 10.6$	$44.4 \pm 10.5$	0.094		
Mental health	$50.5 \pm 9.2$	$48.8 \pm 9.4$	$50.9 \pm 9.1$	0.104		
Physical component summary	43.9 ± 11.3	$42.7 \pm 10.5$	44.3 ± 11.5	0.162		
Mental component summary	$56.5 \pm 7.4$	$56.1 \pm 7.5$	$56.6 \pm 7.4$	0.582		
Role/Social component summary	$40.7 \pm 10.7$	$38.8 \pm 11.7$	$41.1 \pm 10.4$	0.079		

\*VAWS ; Violence Against Women Screen

pandemic. The most common type of violence was psychological violence with VAWS score of 2-3. Physical violence gradually exacerbated at a VAWS score of greater than 4. This study included 303 pregnant women. Sample size was calculated as follow; the number of deliveries recorded within 6 months of the study period was estimated at about 1500 as there are approximately 3000 deliveries per year in Miyazaki City. We administered the survey and received responses from 303 participants. The collection rate was expected to be about 20%. In the chi-squared test, the sample size was 145 with an effect size of 0.3, a power of 80%, and a significance level of 5%. Accordingly, the number of participants enrolled in this study (n = 303) was considered to be sufficient for obtaining a medium effect size.

To our knowledge, the frequency of DV in Japanese

pregnant women during the COVID-19 pandemic has not been reported. Kataoka et al. conducted a survey before the pandemic and reported that 20.7% of pregnant women experienced DV10, similar to our report. However, we believe that we could not accurately evaluate the effect of COVID-19 pandemic on DV against pregnant women, as our survey and theirs have different backgrounds, including the living environment of the surveyed population. However, there are several studies reporting the influence of COVID-19 pandemic on DV against pregnant women. In Iran, Naghizadeh et al. showed that 35.2% of pregnant women suffered from DV during the COVID-19 pandemic, but this percentage was lower than that before the pandemic<sup>11)</sup>. In Ethiopia, Asratie showed that 65.8% of pregnant women were exposed to DV during the COVID-19 pandemic, higher than that before the pandemic  $(64.6\%)^{12}$ . Asratie

speculated that the exacerbated maternal healthcare services during the COVID-19 pandemic impacted the frequency of DV during pregnancy. In the general population, DV incidence increased during the COVID-19 pandemic according to a finding by a systematic review and meta-analysis of several studies from different sites, states, and several countries worldwide, including Mexico, Italy, Sweden, Australia, Argentina, and India<sup>4)</sup>. In Japan, Kataoka et al. reported that the prevalence of DV in pregnant women decreased compared with that before pregnancy<sup>10)</sup>. Pregnant women are thought to be more vulnerable to DV. However, Kataoka et al. indicated that pregnant women are at risk for DV during pregnancy if they are already exposed to DV prior to conception, not the pregnancy itself<sup>10</sup>. Maternal healthcare services for pregnant women in Japan may have functioned well even during the pandemic. Alternatively, partners may be less likely to assault during pregnancy because of the avoidance of hurting the unborn baby or the social unacceptability of hurting pregnant women.

The prevalence of DV varies between countries. These differences between countries might arise from ethnic differences, economic conditions, and the sociocultural context of the participants, as well as the difference in methods to detect DV. In this study, we used VAWS, which was developed by Kataoka et al. This method is a screening instrument aiming for an early intervention for abused women. However, pregnant women with low scores such as 2-3 may include those who were unaware of DV. Additionally, there were 42 (13.9%) pregnant women with a score of 1. These women were classified as "negative violence" according to VAWS. Notably, the most common type of violence experienced by our participants was psychological violence at a low score. Physical violence was gradually apparent as the score increased. Both et al. proposed that the existence of a cycle in the context of DV<sup>13)</sup>. The cycle of DV continues if the victims remain in a relationship because of fear of aggression or of risking their lives, including their children, or difficulty in recognizing DV actions as violent<sup>13)</sup>. In addition, constant violence causes changes in structural functioning and intrapsychic conflicts<sup>13)</sup>. These changes decrease the victims' ability to think and comprehend<sup>13)</sup>. Given the abovementioned reasons, victims can hardly break the cycle of DV. Moreover, DV is presented with a slow and silent beginning without physical aggression and gradually progressed to actions with greater intensity and then to humiliation beatings<sup>13)</sup>. Thus, pregnant women with score of one should be carefully follow. Additionally, establishing a system that early detects psychological violence and provides support for these women in preventing exacerbating violence is essential.

Pregnant women who worked part time were more exposed to DV than those who worked full time. Pregnant women who did not continue working was more common in those who had been exposed to DV than in those who had not been exposed to DV. This result might be an expression of the partner's desire for dominance and control over pregnant women.

Among the eight subscales of SF-12, physical functioning was the most affected by DV during pregnancy. However, no differences were noted in the scores of the seven other subscales and three components summary. The impact of DV on QOL varies between studies<sup>14,15)</sup>. Garacheh et al. found differences in the six subscales of SF-36, except for physical functioning and bodily pain, between abused and nonabused pregnant women<sup>14)</sup>. However, Tavoli et al. reported that seven subscales of SF-36, except for bodily pain, showed differences between abused and nonabused pregnant women<sup>15)</sup>. They also found that physical violence was the most significant contributing factor to poor general health, and psychological violence to poor mental health<sup>15)</sup>. Accordingly, we think that the difference in the results between studies is caused by the difference in study participants. Our participants were mainly composed of pregnant women with VAWS scores of 2-3. In addition, the prevalence of physical violence was less in pregnant women than in other study participants. In our study, 21% of pregnant women positive for VAWS experienced physical violence. Among them, only two had intense physical violence. According to a systematic review, factors such as maternal age, primiparity, early gestational age, the absence of social and economic problems, having family and friends, doing physical exercise, feeling happy at being pregnant, and being optimistic are associated with better QOL<sup>16)</sup>. Hence, many factors aside from DV are involved in the QOL of pregnant women. Thus, further study is required to clarify the impact of DV on QOL.

The limitation of this study is the lack of information regarding gestational age and medical complications. We conducted this survey while maintaining social distancing during the COVID-19 pandemic; consequently, we could not directly interview our participants regarding medical issues such as medical complications. In addition, physiological changes during pregnancy influence the decline in the physical health status and reduce the capability of women to perform their daily roles<sup>17)</sup>. Nonetheless, we conducted the survey among pregnant women who were managed at primary clinics or who visited the municipal offices to obtain Maternal and Child Health handbooks. Accordingly, we included participants who had a low-risk pregnancy. In addition, their characteristics, except for gestational age, were not markedly different between the abuse and nonabused groups.

In conclusion, approximately 20% of pregnant women included in this study experienced DV. Although the most common type of DV was psychological violence at a low VAWS score, physical violence gradually exacerbated as the VAWS sores increased. Meanwhile, 81% of the pregnant women with one negative-VAWS score experienced psychological violence. The number of women planning to continue working after delivery was higher in those with negative-VAWS than in those with positive-VAWS. DV influenced the physical functioning of QOL, but other areas of QOL showed no difference.

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## **Disclosure statement**

Authors declare no Conflict of Interests for this article.

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# COVID-19 蔓延状況下での Domestic violence が妊婦の 健康関連 Quality of life に与える影響

(2024年3月4日受理)

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コロナ禍における妊婦への Domestic violence (DV)の実態とそれが妊婦の健康関連 Quality of life (QOL) に与える影響を明らかにすることを目的とした。2021年6月30日から11月30日の期間に, 宮崎市在住の妊婦を対象に,QRコードを介した無記名自記式質問紙を用いた横断的調査を実施した。 DVスクリーニングには,女性に対する暴力スクリーニング尺度(Violence Against Women Screen; VAWS)を用いて行った。健康関連QOLの評価には,Japanese version of the 12-item Short Form Survey (SF-12)を使用した。結果:対象妊婦303名の内,62名(20.5%)がDVを経験していた。精 神的暴力が,低スコアでは頻度の高い暴力であったが,スコアが高くなるにつれて,身体的暴力の頻度 が高くなった。出産後に仕事を継続する妊婦の頻度は,DVを受けていない妊婦の方が,受けている妊 婦と比較して有意に高かった。VAWSスコアとSF-12得点には有意な相関はなかったが,SF-12の項 目の内,DVを受けた妊婦の身体機能に関連したSF-12得点は,DVを受けていない妊婦の得点と比較 して有意に低かった。COVID-19蔓延下の妊婦へのDVは,気づきにくい精神的な暴力から始まり,次 第に暴力がエスカレーションしていた。妊婦へのDVを早期に発見するシステムと妊婦へのDVを防ぐ ための支援体制の確立が必要であると考える。

キーワード: COVID-19, Domestic violence, 妊娠, Quality of life

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