



Comparison of pregnancy stress, impact and fear of COVID-19 between working and non-working pregnant women in Korea

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Abstract

The purpose of the study was to investigate and compare the pregnancy stress, impact and fear of COVID-19 between working and non-working pregnant women in Korea. The influencing factors of pregnancy stress considering the pandemic situation were explored in each group. A descriptive cross-sectional study design was used in the study. A total of 150 participants were recruited from Korean online communities where only women can register and exchange information about pregnancy and childbirth. The survey questionnaires included the Prenatal Distress Questionnaire, Pregnancy Experience Scale – brief, COVID-19 Experiences, and Fear of COVID-19. The survey data of 140 participants (74 working pregnant women and 66 non-working pregnant women) were analyzed. Working pregnant women appeared to have more pregnancy stress than non-pregnant women ($p < 0.05$). They described more concerns about labor and delivery, and caring for infant. Non-working pregnant women were having more negative impact of COVID-19 on pregnancy experience ($p < 0.05$). They had more concerns related to prenatal care, obtaining living supplies, and giving birth during the pandemic situation. There were no significant differences in fear of COVID-19 between groups. In both groups, negative pregnancy experience and pregnancy types were significantly related with higher pregnancy stress ($p < 0.05$). While pregnancy stress was significantly higher in the working pregnant women, the negative impact of COVID-19 on pregnancy experience was greater in the non-working pregnant women group. We suggest tailored prenatal management, education, and social supports considering the differences in psychological distress between the groups.

Keywords Pregnancy · Psychological stress · Working women · COVID-19

Introduction

Pregnancy and childbirth are periods of great change for women (Mercer & Walker, 2006). During pregnancy, over 75% of women experience pregnancy stress due to multiple physical, psychological, and social changes (Saur & Dos Santos, 2021). Pregnancy stress has been described as perceived difficulties (Kim & Chung, 2018) or a feeling of imbalance experienced by women when they cannot meet the demands placed upon them (Ruiz & Fullerton, 1999).

Working pregnant women experience more stress, as being a pregnant woman and a worker increases their role burden (Kim & Chung, 2018). There is a significant relationship between pregnancy stress and occupational factors, such as workload, working hours (Widowati et al., 2021), and negative attitudes and reactions from employers and colleagues after a pregnancy announcement (Lojewski et al., 2018). Furthermore, studies have shown that working pregnant women with more stress have higher risks of pregnancy complications, including preterm birth and neonatal morbidity (Effati-Daryani et al., 2020; Katz, 2012).

Meanwhile, the prolonged coronavirus disease (COVID-19) outbreak has led to various inconveniences due to social restrictions (Chakraborty & Maity, 2020; Ferrante et al., 2020; He & Harris, 2020). In addition, the COVID-19 pandemic has negatively affected women's mental health, such as by increasing anxiety and depression (Stepowicz et al., 2020). Anxiety and concerns related to COVID-19 and barriers to healthcare access

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are experiences in pregnant women as well (Lebel et al., 2020). Pregnancy stress levels during the pandemic are reported to be moderate to high (Stepowicz et al., 2020). The COVID-19-related fears, worries, and social isolation have been cited as worsening factors for pregnancy stress (Lebel et al., 2020).

These additive workplace and pandemic-related stressors put working pregnant women at risk of higher pregnancy stress. The present study aimed to explore differences in psychological distress and pregnancy experiences between working and non-working women during the COVID-19 pandemic. First, the pregnancy stress, impact and fear of COVID-19 of working and non-working pregnant women were explored and compared. Then, the influencing factors of pregnancy stress, considering the pandemic situation, were examined for each group.

Materials and methods

Participants and settings

The study used a descriptive cross-sectional study design by administering an online survey. The sample size of participants was calculated to be 123 based on G*Power 3.1.9.7 software, with a power of 0.90, alpha level of 0.05, and effect size of 0.15 (Nahm, 2015). Considering the length of the survey, which was expected to take 20 min, we over-sampled the participants by 20%. A total of 150 participants were recruited for the study.

The inclusion criteria of the study were Korean pregnant women before 36 weeks of pregnancy who can read, understand, and type words through a smartphone. To ensure pregnant women's safety during the COVID-19 pandemic and to include women from diverse backgrounds, the convenience sampling method was used online.

Data collection

The study was approved by Institutional Review Board of the project investigator's affiliated institution (#MC21QISI0066). The study data were collected between July and August, 2021. The study was advertised in one of the major Korean online communities where only women can register and exchange information about pregnancy and childbirth. The web post included the study participation link. Once the potential participants clicked on the link, they could review the details of the study, agree to participate, and complete the survey, which took an average of 15–20 min. A mobile gift card worth approximately \$30 was given to the participants upon completion of the survey.

Survey questionnaire

The participants received 23 items on sociodemographic, pregnancy-related, and work pattern-related questions. Consequently, questions on pregnancy stress, pregnancy experience, pregnancy-related COVID-19 negative experience, and fear of COVID-19 were asked. For working pregnant women, 28 questions on work patterns and work stress were asked additionally.

Pregnancy stress The pregnancy stress was measured using the Prenatal Distress Questionnaire (PDQ) (Yali & Lobel, 1999). It is a 12-item questionnaire which include questions on concerns and discomforts related to pregnancy (Alderdice & Lynn, 2011). Each item is scored on a 5-point Likert scale (where “not at all” = 0 and “extremely” = 4). The higher scores indicate higher levels of pregnancy stress. The Cronbach's alpha from the article which developed the scale was 0.81 (Yali & Lobel, 1999). The research team translated the scale into Korean using forward-and-back translation with permission from the developer, as there was no pre-existing Korean version of the scale (Squires et al., 2013). The Cronbach's alpha of the Korean PDQ in this study was 0.815.

Pregnancy experience The pregnancy experience was explored using the Pregnancy Experience Scale (PES) – brief (DiPietro et al., 2008). The scale included 10 questions each of pregnancy hassles and uplifts. The 20-item is scored on a 4-point Likert scale (where “not at all” = 0 and “a great deal” = 3). Out of six scoring rubrics yielded by this scale, we used two scores: intensity of uplifts (sum of 10 uplifts) and intensity of hassles (sum of 10 difficulties) (van der Zwan et al., 2017). Higher scores indicate a person having more positive or negative pregnancy experiences. The Cronbach's alpha of PES in this study was 0.780.

Impact of COVID-19 on pregnancy The COVID-19 impact on pregnancy was explored using the “Sect. 8: Pregnancy-related questions” of the COVID-19 Experiences (COVEX) questionnaire (Fisher et al., 2020). The section contains 11 questions. The first 10 questions ask about negative experiences as a pregnant during the COVID-19 pandemic and last question asks which trimester a woman is in. As the questionnaire does not provide a scoring rubric, we scored the items on a 5-point Likert scale (where “not at all” = 1 and “very much” = 5). The sum score of the first 10 questions on the experiences were used for the study. Higher scores indicate more negative experiences and impact during the COVID-19 pandemic. The Cronbach's alpha of the 10 questions was 0.860 in the study.

Fear of COVID-19 The participants' fear related to COVID-19 was examined using the Fear of COVID-19 scale (Ahorsu et al., 2020). Each of seven items was scored on a 5-point Likert scale (where "strongly disagree" = 1 and "strongly agree" = 5). As per the scale's scoring guide, the added sum score was used for the study. Higher scores indicate a greater fear of COVID-19. The Cronbach's alpha of the scale was 0.894 in this study.

Work stress The working pregnant women's work stress was explored using the Korean Occupational Stress Scale – Short Form (KOSS-SF) (Chang et al., 2005). It is a 24-item questionnaire which included questions on work demands and work climate. The scale was scored on a 4-point Likert scale (where "hardly ever" = 1 and "very much" = 4). The higher scores indicate a person having more work stress. The Cronbach's alpha of KOSS-SF in this study was 0.799.

Analysis

The SPSS 25.0 statistical software package was used to analyze quantitative data. To minimize the study bias and maintain the validity of the study, data sets of participants who did not complete over 10% of the survey questions were excluded from the study. The remaining participants' data were assessed at random to check whether any were missing, and all analyses were conducted without data imputation (Enders & Bandalos, 2001). The participants' sociodemographic data were analyzed using mean, standard deviation, and percentage. The differences in study variables between working and non-working pregnant women were analyzed using the independent *t*-test. To explore the influencing factors of pregnancy stress, hierarchical regression was performed for each group.

Results

Participants flow and background information

A total of 150 participants were recruited for the study (i.e., 78 working and 72 non-working pregnant women). The data of four participants and six participants from the two groups, respectively, were excluded from the study, as they did not complete over 10% of the questionnaire. Hence, a total of 140 participants' data was analyzed in this study. Table 1 shows the background information of both working and non-working pregnant women. There were no significant differences between the two groups.

Differences in pregnancy stress, impact and fear of COVID-19 between groups

The differences of the study variables between two groups are described in Table 2. Pregnancy stress was significantly higher in working pregnant women (31.38 ± 7.11) than in non-working pregnant women (28.62 ± 7.92) ($t = 2.170$, $p < 0.05$). Specifically, as shown in Table 3, working pregnant women reported more concerns about labor and delivery (item #10), and handling the newborn (item #3).

The negative impact of COVID-19 on pregnancy experience was significantly greater in non-working pregnant women (33.36 ± 6.82) than in working pregnant women (30.76 ± 7.94) ($t = -2.073$, $p = 0.040$). Non-working pregnant women reported more concerns in disruptions to prenatal care (item #4a), separation from family members (item #4c), loss of income/finances (item #4d), difficulty obtaining essential resources (e.g., food, water, cleaning supplies) (item #4e), giving birth/delivery in hospital because afraid of being exposed to COVID-19 (item 4f). There were no significant differences between groups in pregnancy experiences (both positive and negative), and fear of COVID-19 ($p > 0.05$).

Influencing factors of pregnancy stress

Working pregnant women The first model, which included the entry of the sociodemographic and baseline variables, positive and negative pregnancy experiences, was statistically significant ($p < 0.01$) and explained 49.8% of the variance in pregnancy stress among working pregnant women ($R^2 = 0.498$). The second model related with working, which included work type, working experience, average working hours a day and working days a week, and work stress, explained additional 7.8% of the variance in pregnancy stress (R^2 change = 0.078; $R^2 = 0.576$, $p > 0.05$). The final model is shown in Table 4. The model which included the impact of COVID-19 on pregnancy and COVID-19 fear, was statistically significant ($p < 0.01$), and explained additional 8.9% of the variance in pregnancy stress ($R^2 = 0.665$, R^2 change = 0.089; $p < 0.01$).

Negative pregnancy experience continued to be significantly related to the pregnancy distress throughout the models 1 ($\beta = 0.62$, $p < 0.001$), models 2 ($\beta = 0.54$, $p < 0.001$), and models 3 ($\beta = 0.54$, $p < 0.001$). Religion continued to be significantly related to the pregnancy distress throughout the models 1 ($\beta = 0.33$, $p < 0.05$), models 2 ($\beta = 0.45$, $p < 0.01$), and models 3 ($\beta = 0.48$, $p < 0.01$).

Non-working pregnant women The first model, which included the entry of the sociodemographic and baseline variables, positive and negative pregnancy experiences, was statistically significant ($p < 0.001$) and explained 70.8% of

Table 1 General characteristics of participants ($N = 140$)

Variables		Working ($N = 74$)	Non-Working ($N = 66$)	Total ($N = 140$)	t / X^2	
		Mean \pm SD or N (%)				
Age (years)		32.03 \pm 3.45	32.12 \pm 3.88	32.07 \pm 3.65	-.152	
Gestational weeks		23.85 \pm 8.01	25.03 \pm 8.40	24.41 \pm 8.19	-.849	
Pregnancy type	Natural pregnancy	65 (87.8)	56 (84.8)	121 (86.4)	.597	
	Ovulation induction	1 (1.4)	3 (4.5)	4 (2.9)		
	Artificial insemination	1 (1.4)	2 (3.0)	3 (2.1)		
	In vitro fertilization	7 (9.5)	5 (7.6)	12 (8.6)		
Obstetric history	Living baby	0	57 (77.0)	47 (71.2)	104 (74.3)	.400
		1	15 (20.3)	14 (21.2)	29 (20.7)	
		2	2 (2.7)	5 (7.6)	7 (5.0)	
	Preterm delivery	0	72 (97.3)	65 (98.5)	137 (97.9)	.637
		1	1 (1.4)	1 (1.5)	2 (1.4)	
		Don't want to answer	1 (1.4)	0 (0.0)	1 (0.7)	
	Spontaneous abortion	0	70 (94.6)	57 (86.4)	127 (90.7)	.206
		1	3 (4.1)	8 (12.1)	11 (7.9)	
		2	1 (1.4)	1 (1.5)	2 (1.4)	
		Don't want to answer	0 (0.0)	1 (1.5)	1 (0.7)	
Artificial abortion	0	71 (95.9)	63 (95.5)	134 (95.7)	.567	
	1	2 (2.7)	2 (3.0)	4 (2.9)		
	2	1 (1.4)	0 (0.0)	1 (0.7)		
	Don't want to answer	0 (0.0)	1 (1.5)	1 (0.7)		
Menstrual health	Menarche age		12.31 \pm 1.53	12.02 \pm 1.78	12.17 \pm 1.65	1.057
	Menstruation days		5.84 \pm 1.06	5.74 \pm 1.07	5.79 \pm 1.06	.529
	Menstruation cycle ($N = 139$)		29.89 \pm 4.19	29.55 \pm 2.40	29.73 \pm 3.46	.573
	Menstruation regularity	Very regularly	25 (33.8)	15 (22.7)	40 (28.6)	.382
		Regularly	45 (60.8)	44 (66.7)	89 (63.6)	
		Irregularly	3 (4.1)	6 (9.1)	9 (6.4)	
		Very irregularly	1 (1.4)	1 (1.5)	2 (1.4)	
	Menstruation amount	Small	9 (12.2)	4 (6.1)	13 (9.3)	.110
Normal		56 (75.7)	46 (69.7)	102 (72.9)		
Large		9 (12.2)	16 (24.2)	25 (17.9)		
Marriage	Married		72 (97.3)	65 (98.5)	137 (97.9)	.628
	Unmarried		2 (2.7)	1 (1.5)	3 (2.1)	
Persons living together	Husband		72 (97.3)	58 (87.9)	130 (92.9)	.089
	Husband and Birth parents		2 (2.7)	7 (10.6)	9 (6.4)	
	Husband and Parents-in-law		0 (0.0)	1 (1.5)	1 (0.7)	
Religion	Religion	Yes	31 (41.9)	24 (36.4)	55 (39.3)	.504
		No	43 (58.1)	42 (63.6)	85 (60.7)	
	Religious activity	Often	3 (4.1)	6 (9.1)	9 (6.4)	.436
		Sometimes	7 (9.5)	9 (13.6)	16 (11.4)	
		Little	20 (27.0)	13 (19.7)	33 (23.6)	
		Never	44 (59.5)	38 (57.6)	82 (58.6)	
Social economic status	Good		4 (5.4)	4 (6.1)	8 (5.7)	.074
	Fair		67 (90.5)	52 (78.8)	119 (85.0)	
	Poor		3 (4.1)	10 (15.2)	13 (9.3)	

Table 1 (continued)

Variables			Working (N=74)	Non-Working (N=66)	Total (N=140)	t / X ²
			Mean ± SD or N (%)			
Work	Work	Yes			74 (52.9)	-
		No			66 (47.1)	
	Work type	Medical	7 (9.5)		7 (5.0)	-
		Education	9 (12.2)		9 (6.4)	
		Office worker	49 (66.2)		49 (35.0)	
		Public officer	1 (1.4)		1 (0.7)	
		Service	1 (1.4)		1 (0.7)	
		Others	7 (9.5)		7 (5.0)	
		Working condition	Working experience (Months)	59.04 ± 33.53		59.04 ± 33.53
	Average working hours a day	7.89 ± 1.04		7.89 ± 1.04		
Average working days a week	5.96 ± 5.72		5.96 ± 5.72			
Region	Seoul	42 (56.8)	17 (25.8)	59 (42.1)	.001	
	Gyeonggi-do	25 (33.8)	39 (59.1)	64 (45.7)		
	Others	7 (9.5)	10 (15.2)	17 (12.1)		

Working = Working pregnant women; Non-working = Non-working pregnant women

Table 2 Differences in study variables between groups

Variables	Working (M ± SD)	Non-working	t	p
Pregnancy distress	31.38 ± 7.11	28.62 ± 7.92	2.170	.032
Pregnancy experience (Positive)	1.91 ± 0.48	1.85 ± 0.50	.666	.506
Pregnancy experience (Negative)	1.68 ± 0.52	1.66 ± 0.47	.282	.778
Impact of COVID-19 on pregnancy	30.76 ± 7.94	33.36 ± 6.82	-2.073	.040
Fear of COVID-19	20.88 ± 6.98	20.73 ± 5.66	.140	.889

Working = Working pregnant women; Non-working = Non-working pregnant women; COVID-19 = Coronavirus Disease

Table 3 Differences in specific questionnaire items between groups

Questionnaires	Items	Working (M ± SD)	Non-working	t	p
Pregnancy distress	3. I am worried about handling the infant when I first come home from the hospital	3.12 ± 0.95	2.53 ± 1.07	3.463	.001
	10. I am anxious about labor and childbirth	3.36 ± 0.92	2.94 ± 1.08	2.523	.013
Impact of COVID-19 on pregnancy	Worried and stressed about:				
	4a. disruptions to prenatal care	2.61 ± 1.08	3.20 ± 1.15	-3.115	.002
	4c. separation from family members	2.88 ± 1.16	3.45 ± 0.98	-3.158	.002
	4d. loss of income/finances	2.20 ± 1.01	3.02 ± 1.20	-4.363	.000
	4e. difficulty obtaining essential resources (food, water, cleaning supplies)	2.09 ± 1.06	2.48 ± 1.08	-2.149	.033
	4f. giving birth/delivery in hospital because afraid of being exposed to COVID	2.81 ± 1.24	3.29 ± 1.19	-2.324	.022

Working = Working pregnant women; Non-working = Non-working pregnant women; COVID-19 = Coronavirus Disease

Table 4 Influencing factors of pregnancy stress by groups (Final Regression Models)

Variable	Working			Non-working		
	B	SE (B)	β	B	SE (B)	β
(Constant)	16.62	23.53		-39.00	19.12	
Age	-0.79	0.30	-0.39*	0.24	0.28	0.11
Pregnancy type	2.80	1.33	0.36*	-2.61	1.17	-0.28*
Gestational weeks	-0.09	0.10	-0.10	0.30	0.10	0.31**
Menarche age	1.05	0.55	0.23	0.13	0.52	0.03
Menstruation days	-0.34	0.82	-0.05	-0.10	0.78	-0.01
Menstruation cycle	-0.14	0.20	-0.08	0.74	0.38	0.22
Menstruation regularity (regular)	0.58	1.53	0.05	-1.06	1.38	-0.08
Menstruation amount (average)	0.10	1.49	0.01	-0.16	1.81	-0.01
Living baby (none)	-1.13	1.87	-0.08	-3.82	1.71	-0.28*
Preterm delivery (none)	0.70	0.71	0.10	13.20	8.22	0.21
Spontaneous abortion (none)	3.93	2.81	0.17	0.16	2.12	0.01
Artificial abortion (none)	-1.67	2.61	-0.07	-1.34	0.70	-0.19
Religion (no)	6.88	2.16	0.48**	1.35	2.61	0.08
Religious activity (never)	-2.28	1.26	-0.27	2.13	1.14	0.27
Region (Seoul)	0.54	1.29	0.05	-0.86	1.49	-0.07
Marriage	-2.55	4.67	-0.06	-0.25	5.30	0.00
Persons living together (husband)	-0.10	0.93	-0.01	1.35	0.53	0.27*
Social economic status (fair)	2.63	2.86	0.11	2.57	1.93	0.15
Pregnancy experience (Positive)	-2.65	1.84	-0.18	2.24	1.87	0.14
Pregnancy experience (Negative)	7.42	2.09	0.54***	5.90	1.99	0.34**
Work type (office worker)	-1.51	0.71	-0.25*	-	-	-
Working experience	0.00	0.03	0.01	-	-	-
Average working hours a day	-0.18	1.09	-0.03	-	-	-
Average working days a week	-0.16	0.14	-0.13	-	-	-
Work stress	0.36	0.16	0.27*	-	-	-
Impact of COVID-19 on pregnancy	-0.30	0.15	-0.34*	0.10	0.15	0.08
COVID-19 fear	0.50	0.14	0.49**	0.24	0.16	0.17
R^2/R^2 change	0.665/0.089**			0.728/0.020		
F	3.380***			5.118***		

Working=Working pregnant women; Non-working=Non-working pregnant women; COVID-19=Coronavirus Disease

the variance in pregnancy distress among non-working pregnant women ($R^2 = 0.708$). The second model, which included pregnancy-related COVID-19 negative experiences, explained additional 2.0% of the variance in pregnancy distress (R^2 change = 0.020; $R^2 = 0.728$, $p > 0.05$).

Pregnancy type continued to be significantly related to the pregnancy distress throughout the models 1 ($\beta = -0.30$, $p < 0.05$) and models 2 ($\beta = -0.28$, $p < 0.05$). Gestational weeks continued to be significantly related to the pregnancy distress throughout the models 1 ($\beta = 0.38$, $p < 0.001$) and models 2 ($\beta = 0.31$, $p < 0.01$). The number of living baby continued to be significantly related to the pregnancy distress throughout the models 1 ($\beta = -0.27$, $p < 0.05$) and models 2 ($\beta = -0.28$, $p < 0.05$). Persons living together continued to be significantly related to the pregnancy distress throughout the models 1 ($\beta = 0.33$, $p < 0.01$) and models 2 ($\beta = 0.27$,

$p < 0.05$). Negative pregnancy experience continued to be significantly related to the pregnancy distress throughout the models 1 ($\beta = 0.41$, $p < 0.001$) and models 2 ($\beta = 0.34$, $p < 0.01$).

Discussion

In this study, the pregnancy stress, impact and fear of COVID-19 of working and non-working pregnant women were compared. The characteristics of the participants, including age and work type, were similar to data from the South Korean National Health Insurance system, in which 97% of Koreans are registered (Park et al., 2017).

Pregnancy stress was significantly higher among working pregnant women than non-working pregnant women. This finding supports previous studies which indicated that additive job stress from the workplace increases overall pregnancy stress (Park et al., 2017; Sanguanklin et al., 2014). Stress from work accounted for 54% of psychological distress in pregnant women (Sanguanklin et al., 2014). Therefore, stress management interventions for pregnant women at work have been suggested in various studies (Lojewski et al., 2018; Sanguanklin et al., 2014). In the present study, working pregnant women were more worried about labor, childbirth, and caring for infants at home than non-working pregnant women. These findings are similar to previous studies which have described working mothers' struggle to maintain work-family balance and found that they had more parenting stress than non-working pregnant women (Ahn et al., 2021; Rojjanasrirat, 2004).

In the present study, the impact of COVID-19 on pregnancy was significantly greater in non-working pregnant women than working pregnant women. Non-working pregnant women were especially worried about disruptions to prenatal care, separation from family members, loss of income, difficulties with obtaining essentials for daily living, and exposure to COVID-19 while giving birth in a hospital. Several studies exploring the impact of the stay-at-home orders on people's mental health found that it increased acute stress, depression, and anxiety (Marroquín et al., 2020; Sher, 2020). Moreover, this order was associated with financial worry and loneliness (Tull et al., 2020). It is possible that non-working pregnant women followed the public atmosphere of social distancing, stayed at home, and were more influenced by the pandemic than working pregnant women who still interacted with co-workers and gained social support.

The influencing factors of pregnancy stress affected differently between working and non-working pregnant women. Pregnancy type and negative pregnancy experiences were significant influencing factors of pregnancy stress in both groups. Non-working women with assistive pregnancies (i.e., ovulation induction, artificial insemination, in vitro fertilization) had higher levels of pregnancy stress. Similarly, previous studies identified an association between having a high-risk pregnancy and a higher level of psychological distress (Saur & Dos Santos, 2021; Sinaci et al., 2020). Moreover, the need for frequent in-person care visits could be an additive burden for women during the COVID-19 pandemic (Aziz et al., 2020; Sinaci et al., 2020).

In the present study, working and non-working pregnant women with more negative pregnancy experiences had greater pregnancy stress. The questionnaire on negative pregnancy experiences included various types of physical discomfort caused by pregnancy, such as insufficient sleep, heartburn, and weight gain. They also included concerns

about physical changes, the health of the baby, labor, and delivery. The findings support previous study which women with pregnancy-related physical discomfort, including morning sickness, were found to have high levels of pregnancy stress (Tang et al., 2019). Moreover, concerns about income and the health of the fetus have been correlated to high levels of pregnancy stress (Saur & Dos Santos, 2021; Tang et al., 2019).

Study limitations

There are several study limitations to be considered. First, more factors related to pregnancy stress could have been collected and analyzed. Several factors, including level of education, unplanned pregnancy, previous history of depression, substance abuse, and domestic violence, are factors associated with pregnancy stress (Saur & Dos Santos, 2021). More comprehensive exploration could have been carried out by including these factors. Second, the study is limited as it relied on the participants' answer to measure stress. In general, stress is subjective and difficult to measure. Therefore, many studies have described it as perceived stress and relied on participants' responses. Still, the objectiveness of measuring stress is limited. Third, the use of a web-based study design holds risks of non-random sampling related to a web-based study methodology (Gordon & McNew, 2008). Considering that our study participants were relatively young reproductive women, we expect minimal sampling bias with the use of Internet or electronic devices. However, this limitation still needs to be considered. Fourth, the generalizability of the study is limited as we only included Korean pregnant women. The influence of COVID-19 may differ across countries, as social response and the atmosphere created by the pandemic are different. Careful consideration is necessary when applying the study findings to pregnant women from other countries.

Conclusion

The COVID-19 pandemic has disrupted our societies, and this situation has influenced pregnant women's psychological distress and pregnancy experiences. The purpose of this study was to explore and compare the pregnancy stress, impact and fear of COVID-19 of working and non-working pregnant women. While working pregnant women had more pregnancy stress than non-working pregnant women, COVID-19 had a lesser impact on their pregnancies than those of non-working pregnant women. In addition, more negative pregnancy experiences were associated with greater pregnancy stress in both groups.

The study findings have several implications for healthcare practice, education, policy, and research. First,

effective pregnancy stress management is necessary for working pregnant women. In particular, the participants in this group were worried about childbirth and infant care, which was likely the result of insufficient prenatal care due to barriers created by workplace limitations. Prenatal education that addresses the aforementioned worries through acceptable educational methods is necessary for working pregnant women. Moreover, various policies to maintain healthy pregnancy are crucial to empower and support them.

Second, non-working pregnant women need more social support during the pandemic. Non-working pregnant women may have experienced more loneliness and worries because they were more affected by social restrictions (e.g., stay-at-home orders) than working pregnant women who had regular social interactions with co-workers. People with more social supports are less lonely (Tull et al., 2020) and more able to cope with psychological challenges and demands than those with less social support (Saur & Dos Santos, 2021). Comprehensive social support, including the involvement of significant others in prenatal care and emotional and financial support, can help reduce the negative psychological impact of the pandemic on non-working pregnant women.

Third, working and non-working pregnant women would benefit from a reduction in negative pregnancy experiences, such as physical discomfort, concerns, and worries, which increase pregnancy stress. Therefore, efforts to relieve pregnancy discomfort as well as educational and emotional support to reduce concerns and worries should be emphasized in healthcare practice.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s12144-022-04105-8>.

Author contributions Yaelim Lee: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing-Original Draft, Writing-Review&Editing, Seohyeon Kim: Data curation, Investigation, Project administration, Resources, Software, Validation, Visualization, Writing-Original Draft, Writing-Review&Editing.

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Declarations

Ethical approval All study participants provided agreement to participate in the study and the study design was approved by the Catholic Medical Center of Korea Institutional Review Board on June 30th, 2021 (MC21QISI0066).

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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