



ORIGINAL ARTICLE

The association between self-compassion in the postnatal period and difficult experiences with COVID-19 pandemic-related changes during pregnancy: An observational study for women at 1-month postnatal in Japan

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Abstract

Aim: This observational study aimed to describe the rate and degree of difficult experiences with COVID-19 pandemic-related changes (DE) during pregnancy, clarify the relationship between DE and self-compassion of women postnatally, and investigate the influence of compassion from a partner (CP) and compassion from the woman's mother (CM) on this relationship.

Methods: Data from 46 1-month postnatal women in Japan were collected through a self-report questionnaire from October to December 2020. Self-compassion was measured using the Japanese version of the Self-Compassion Scale; DE, CP, and CM were measured using original questions based on prior studies.

Results: Almost all participants (97.8%) experienced more than one DE during pregnancy. Data analyses revealed that DE in maternity hospitals ($d = 0.76$), DE in social support ($d = 0.53$), and CM ($d = 0.64$) were associated with self-compassion. A two-way analysis of variance suggested that CM moderated the relationship between self-compassion and DE in preparation for the baby ($\eta^2 = 0.11$) and the birth plan ($\eta^2 = 0.11$), whereas CP moderated the relationship between self-compassion and DE in social support ($\eta^2 = 0.07$).

Conclusions: Our findings suggest that self-compassion negatively correlates with DE in maternity hospitals and social support. Additionally, CM may buffer the influence of DE in preparation for the baby and the birth plan on self-compassion; moreover, CP may buffer the influence of DE in social support on self-compassion. This study highlights the importance of supporting perinatal women to adapt to COVID-19-related changes through cooperation with their families, which may increase self-compassion.

KEYWORDS

COVID-19, mothers, pregnancy, self-compassion, spouses

1 | INTRODUCTION

It is essential to clarify the influence of challenging periods, such as the COVID-19 pandemic, on the mental health of postnatal women and improve their psychological abilities. An increase in postnatal depression was reported at the onset of the pandemic; that is, the prevalence of postnatal depression in Japan was reported to be 33.5% in 2020 as opposed to 5.8–25.0% in 2013–2014 (Obata et al., 2021; Takehara et al., 2018). Difficult experiences caused by the pandemic during the perinatal period could trigger postnatal depression caused by insufficient social support, home isolation, remote healthcare consultation, financial insecurity, and changes in familial relationships (Taubman-Ben-Ari et al., 2020; Thapa et al., 2020). However, emotional support from family could be a primary resource for perinatal women during the pandemic (Farewell et al., 2020). Providing health workers with opportunities to reflect on and share the difficulties perinatal women experience due to the pandemic could help health workers support them regardless of changing circumstances.

Monteiro et al. (2019) hypothesized that psychological resources, such as self-compassion, mediate cognitive experiences. Self-compassion is defined as being kind to oneself, perceiving one's experience as part of the human experience, and possessing mindful awareness in times of suffering (Neff, 2003b). The three sub-concepts of self-compassion, self-kindness, a sense of common humanity, and mindfulness, enable individuals to protect themselves (Neff, 2003a) and deactivate the typical stress response to critical threats such as self-judgment, isolation, and over-identification (Gilbert, 2020; Neff & Germer, 2018). Some people with fewer attachment experiences in childhood may experience fear in receiving and showing compassion toward self in such emotional threats (Gilbert, 2020; Gilbert et al., 2011). Self-compassion is negatively associated with postnatal depression (Felder et al., 2016; Guo et al., 2020). Thus, self-compassion may help perinatal women cope with their emotional distress and prevent the development of mental illness during the pandemic.

It may also be pertinent to consider the long-term influence of these difficult experiences on self-compassion. Even after the perinatal period, self-compassion is beneficial for mothers because it encourages a nonjudgmental evaluation of their role as mothers (Malis et al., 2017), more accepting parenting styles (Gouveia et al., 2016), healthy mother–child relationships (Gouveia et al., 2018), and the child's development (Moreira et al., 2015). While self-compassion is elicited in times of suffering (Germer, 2009), it may also be affected by how the individual overcame these difficult experiences or left them unresolved. While self-compassion is greatly

influenced by attachment experiences in childhood (Germer, 2009; Moreira et al., 2018), aging and emotional maturity based on various life experiences may also positively influence self-compassion in adulthood (Neff & Pommier, 2013). During emotional distress, the quality of interpersonal experiences, especially with attachment figures (i.e., a partner and mother), may enhance or suppress self-compassion afterwards (Latheren et al., 2020). For example, a husband's compassion toward his partner increases his sensitivity to his partner's distress and encourages more supportive behavior through emotional empathy (Collins et al., 2014). Additionally, pregnant women often recognize their mothers as an attachment figure, which may remind them of their own attachment experiences during childhood (Latheren et al., 2020). The perinatal period is a critical point of self-change through seeking help from attachment figures (Reisz et al., 2019) and accomplishing maternal tasks such as safe passage during pregnancy and childbirth (Rubin, 1984). In this susceptible period, some psychological interventions during pregnancy can increase the level of self-compassion (Guo et al., 2020; Townshend et al., 2018). However, difficult experiences caused by pandemic-related changes may be positively or negatively related to self-compassion in postnatal women, and how compassion from family influences these relationships remains unknown.

1.1 | Objectives

This study aimed to: (1) describe the rate and degree of the perceived difficulty of “difficult experiences with COVID-19 pandemic-related changes” (DE) during pregnancy among Japanese women; (2) investigate the relationship between DE during pregnancy and self-compassion of postnatal women; and (3) investigate the influence of “compassion from a partner” (CP) and “compassion from the woman's mother” (CM) recognized by postnatal women on the relationship between DE and self-compassion. Our hypotheses are: (1) perinatal women have experienced DE as suggested in previous studies; (2) DE during pregnancy will have a negative correlation with self-compassion of postnatal women; and (3) higher CP and CM will buffer these relationships between both DE and self-compassion.

2 | METHODS

2.1 | Study design

The study employed an observational study design with an anonymous online questionnaire for women at 1 month postnatal in Japan.

2.2 | Setting

The hospital staff selected participants who met the criteria between October and December in 2020. This period was selected as the most suitable for recruitment of participants who had become pregnant in approximately January to March in 2020 when the COVID-19 outbreak had begun and had spent their entire pregnancy period with the chaos of the pandemic. The participants were then recruited using the research briefing document. Next, researchers or hospital staff asked them to complete a questionnaire through Google Forms by 1 day before 2 months postnatal. Participants consented to the study by clicking the consent button on the form and completing the questionnaire. Subsequently, the participants were sent an electronic gift card (JPY 500) via email.

2.3 | Participants

Participants included 1-month postnatal women (the period was ensured by a question in the questionnaire) with sufficient Japanese language skills to read and answer the questionnaire, aged 18 years and above, who had visited one of two hospitals in Tokyo, Japan, for 1-month postnatal checkups during October–December 2020. Postnatal women who had never stayed with their babies at home postnatally were excluded due to the lack of sufficient experience in caring for their babies. Further, those whose prenatal progress was judged to be inappropriate for participation by the hospital staff (i.e., those who had a serious episode of psychological problems during pregnancy, delivery, or postnatal) were also excluded. This study was approved by the Research Ethics Committee of the Graduate School of Medicine, The University of Tokyo (No. 2020201NI).

2.4 | Variables and measurements

2.4.1 | Self-compassion in women at 1 month postnatal

The Japanese version of the Self-Compassion Scale (SCS-J) was used (Arimitsu, 2014; Neff, 2003b). It consists of 26 items with six subscales referring to three bipolar sub-concepts of self-compassion: self-kindness versus self-judgment, a sense of common humanity versus isolation, and mindfulness versus over-identification. These are rated on a five-point Likert scale ranging from “1: Almost never” to “5: Almost always,” and the scores of three subscales, self-judgment, isolation, and over-identification, are reverse-coded. A higher total score indicates a higher level of self-compassion. In this study, the Cronbach’s α for the total score was .78.

2.4.2 | Difficult experiences with COVID-19 pandemic-related changes (DE)

Eight kinds of changes expected to be recognized as DE were: prenatal checkup (e.g., restrictions regarding accompanying family and additional rules for infection control), preparation for the baby (e.g., cancellation of maternal/parental classes and changes in means of shopping for baby items), maternity hospital (e.g., changing from a maternity hospital close to their parental home to one closer to their own home due to cancelling the visit to parental home), birth plan (e.g., restrictions regarding accompanying family during delivery), social support for housework and childcare (e.g., cancelling visit to their parental home during pregnancy, visits of supporters such as mother, and use of public support), family’s daily life (e.g., homeschooling or shutting down of nurseries of their other children and changes in family members’ working style), working style (e.g., remote working, temporary holidays, and staggered working hours), and household finance (e.g., decrease in household income and unexpected expenses). These factors were selected based on prior studies (Caparros-Gonzalez & Alderdice, 2020; Farewell et al., 2020; Taubman-Ben-Ari et al., 2020; Thapa et al., 2020; Zanardo et al., 2020), and from the guidelines about pregnancy and delivery during the pandemic published by the Japan Society of Obstetrics and Gynecology (2020) and the Japan Association of Obstetricians and Gynecologist (2020). Participants were asked whether they had experienced each change; if they answered “yes”, they were asked to rate the degree of difficulty for each change using a five-point Likert scale ranging from “0: Not difficult at all” to “4: Extremely difficult.” Participants with a zero rating or those who answered that they did not experience the change were categorized as “Non-DE,” and those who answered “yes” with one or higher rating of difficulty were categorized as “DE” for each change.

2.4.3 | Compassion from family

CP and CM were assessed only for the participants who indicated that they communicated with a partner or a mother during pregnancy, regardless of face-to-face or device-based communication, to ensure the participants and their partner or mother had some kind of interaction. In this study, a partner is an individual the participants will raise their baby with, and a mother is an individual the participants consider “a mother” regardless of their biological, adoptive, or foster identity. These were measured using five original items created by the researchers based on previous studies and a scale on compassion (Gilbert & Choden, 2014; Hacker, 2008): “He/She looked

after me with tender care”; “He/She tended to be sensitive to my well-being”; “He/She was empathic when I made a mistake”; “He/She tended to show understanding and care;” and “He/She was caring when I was in distress.” These items were rated separately for CP and CM on four-point Likert scales ranging from “1: Do not agree” to “4: Agree strongly.” Although researchers hypothesized the total CP and CM scores would employ a categorical feature as a reflection of marital or mother-and-daughter relationships, there were no cut-off scores for these original items. Because categorization would be helpful to interpret the buffering effects of CP and CM, the total CP and CM scores were divided into two groups of “high” and “low” compassion using cluster analysis following the verification of the categorical feature of score distribution.

2.4.4 | Characteristics of participants

The demographic variables collected in this study were age, nationality, marital status, number of family members, and annual income. These were collected to capture the characteristics of family circumstances and experiences that may be related to changes due to the pandemic during pregnancy, based on previous studies. Other variables were parity, unplanned pregnancy, multiple pregnancies, obstetrical problems during pregnancy, mode of delivery, abnormal bleeding with delivery, obstetrical problems and perceived physical symptoms at 1-month postnatal, undergoing medical treatment for mental illness, a history of mental illnesses, baby's gender, baby's birth weight, baby's medical problems postnatally, and baby's history of hospitalization. These were collected to consider other relevant difficult experiences during the perinatal period. Some variables were selected with reference to previous studies which investigated the psychological impact of the COVID-19 pandemic on perinatal women (Berthelot et al., 2020; Farewell et al., 2020; Taubman-Ben-Ari et al., 2020; Zanardo et al., 2020) and other added variables were deemed relevant by researchers.

2.5 | Statistical analysis

First, descriptive statistics for the characteristics of participants, SCS-J, DE, CP, and CM, were conducted. Second, bivariable analyses, such as Welch's *t* test, the Kruskal-Wallis test, and Spearman's rank correlation analysis, were conducted between the total score of SCS-J as the dependent variable and the SCS-J subscales, all demographic variables, DE, CP, and CM as the independent variables. Third, a two-way analysis of variance

(ANOVA) was conducted to test the moderating effects of CP and CM on the relationship between the eight DE and SCS-J total scores (i.e., the interaction effects of the eight DE and CP or CM on the SCS-J total score) after adjusting the characteristic variables that were significantly correlated with the SCS-J total score in the previous analyses. Finally, simple slope analyses were conducted to investigate the relationships between the DE and SCS-J totals in the “high” and “low” CP and CM groups. We accepted $p < .05$ as acceptable and a study with 80% power; and $f = 0.25$ (the medium effect size based on Cohen's measure). The optimal sample size for the two-way ANOVA with interaction effects was 128 in total (64 in each group) using the calculation software G*Power 3.1.9.7 (Faul et al., 2009) with the following settings: $p < .05$; 80% power; $f = 0.25$ (the medium effect size based on Cohen's measure). We selected the medium effect size based on Cohen's measure (Cohen, 1988) because we could not set the appropriate effect size value from prior studies. The correlations and interaction effects with a medium to large effect size were interpreted as clinically significant in this study. Effect size was considered small if $d \geq 0.20$ / $\eta^2 \geq 0.01$, medium if $d \geq 0.50$ / $\eta^2 \geq 0.06$, and large if $d \geq 0.80$ / $\eta^2 \geq 0.14$ (Cohen, 1988); moreover, two-tailed $p < .05$ was considered statistically significant. All analyses were performed using IBM SPSS Statistics Ver. 26 for Windows (IBM Corp.).

3 | RESULTS

Of the 228 postnatal women who visited the hospitals for a 1-month postnatal checkup, 170 women were asked to participate. The remaining women were excluded for the following reasons: (1) the babies were still admitted to the neonatal intensive care unit ($n = 6$); (2) the women had scheduled an additional interview by care providers for mental problems during their checkup ($n = 11$); (3) the care providers determined the women's participation in this study inappropriate for reasons such as a serious episode of psychological problems during pregnancy, delivery, or postnatal period ($n = 38$); (4) the researcher missed the women at the hospital ($n = 3$). Of the 170 eligible women, 46 consented to participate and answered the questionnaire (response rate: 27.1%).

3.1 | Characteristics of participants

The average age was 33.2 years, and all participants were married except one with missing data. The

TABLE 1 Descriptions of participants and correlations with self-compassion ($N = 46$)

	Mean/n (SD/%) Min. to Max.	Japanese version of the Self-Compassion Scale total score		
		Score ^e	$d^{f,g}$	p^f
Age	33.20 (4.71) 22–42	NA	NA	NA
Nationality: Japanese	46 (100.0)	NA	NA	NA
Marital status: married ^a	45 (97.8)	NA	NA	NA
Number of family members	3.65 (0.95)	NA	NA	NA
Annual income				
Very good	1 (2.2)	76.00	NA	.83
Good	28 (60.9)	82.86		
Average	16 (34.7)	78.19		
Poor	1 (2.2)	85.00		
Parity	1.50 (0.62) 1–3		NA	NA
Primipara	26 (56.5)	81.69	0.08	.79
Multipara	20 (43.5)	80.40		
Unplanned pregnancy				
Yes	12 (26.1)	81.83	0.06	.89
No	34 (73.9)	80.88		
Multiple pregnancies				
Single	45 (97.8)	81.27	NA	NA
Twins	1 (2.2)	75.00		
Obstetrical problems during pregnancy ^b				
Yes	24 (52.2)	80.54	0.07	.81
No	22 (47.8)	81.77		
Mode of delivery				
Vaginal	28 (60.9)	82.14	NA	.58
Forceps delivery or vacuum extraction	1 (2.2)	85.00		
Planned cesarean	8 (17.4)	73.38		
Emergency cesarean	9 (19.5)	84.44		
Abnormal bleeding by delivery: ≥ 500 g ^a				
Yes	21 (45.7)	80.52	0.14	.65
No	23 (50.0)	82.87		
Obstetrical problems at 1-month postnatal				
Yes	0 (0.0)	NA	NA	NA
Perceived physical symptoms at 1-month postnatal ^c				
Yes	30 (65.2)	84.50	0.60	.049*
No	16 (34.8)	74.81		
Under treatment for mental illness				
Yes	0 (0.0)	NA	NA	NA
History of mental illness				
Yes	2 (4.3)	61.50	1.25	.00**
No	44 (95.7)	82.02		

(Continues)

TABLE 1 (Continued)

	Mean/n (SD/%) Min. to Max.	Japanese version of the Self-Compassion Scale total score		
		Score ^e	<i>d</i> ^{f,g}	<i>p</i> ^f
Baby's gender ^a				
Boy	22 (47.8)	84.09	0.30	.33
Girl	23 (50.0)	79.17		
Baby's birthweight: <2500 g				
Yes	5 (10.9)	91.20	0.68	.07
No	41 (89.1)	79.90		
Baby's medical problems after birth ^d				
Yes	12 (26.1)	76.50	0.38	.27
No	34 (73.9)	82.76		
Baby's history of hospitalization in neonatal intensive care unit				
Yes	9 (19.6)	80.22	0.07	0.82
No	37 (80.4)	81.35		

^aMissing data were excluded.

^bProblems such as anemia ($n = 10$), gestational diabetes ($n = 6$), threatened miscarriage/threatened premature delivery ($n = 4$), morning sickness ($n = 3$), and oligoamnion ($n = 2$).

^cProblems such as pain in perineum ($n = 9$), anemia ($n = 8$), back pain ($n = 7$), mastitis ($n = 5$), and cystitis ($n = 4$).

^dProblems such as jaundice ($n = 5$) and ventricular septal defect ($n = 2$).

^eTotal score of 26 items.

^fWelch's *t* test or Kruskal–Wallis test was conducted.

^gCohen's *d*: ≥ 0.20 as small, ≥ 0.50 as medium, and ≥ 0.80 as large effect size.

* $p < .05$. ** $p < .01$.

average number of family members, infants included, was 3.65, and 45 participants (97.8%) rated household finance as above average (Table 1). None of the participants were diagnosed with any problems at the 1-month postnatal checkup, but 30 participants (62.5%) reported physical problems postnatally, such as pain in the perineum, anemia, back pain, mastitis, and cystitis (multiple answers allowed). Additionally, none of the participants were being treated for mental illnesses during data collection; however, two participants (4.3%) had a history of mental illness. Twenty-two participants' infants (47.8%) were boys; five (10.9%) had low birth weight, and 12 (26.1%) had medical problems, such as jaundice and ventricular septal defect. Owing to these problems, nine participants' babies (19.6%) were hospitalized for several days.

3.2 | Difficult experiences with COVID-19 pandemic-related changes (DE) during pregnancy

Almost all participants (97.8%) experienced more than one DE. Changes in prenatal checkup and preparation

for the baby were most common, and more than 90% of those perceived these changes as difficult (Table 2); consequently, these were the most common DEs (80.4% each; Table 4). Meanwhile, changes in maternity hospital, birth plan, and social support were experienced less often (13.0%, 43.5%, and 37.0%, respectively), but almost all participants with these experiences perceived them as difficult (100%, 100%, and 94.1%, respectively). However, only 25% and 37.9% of participants with changes in family life and working style, respectively, perceived difficulties.

3.3 | Self-compassion in postnatal women

The mean of the SCS-J total score was 81.13 ($SD = 16.75$; Table 3). The characteristic factors positively correlated with the SCS-J total were perceived physical symptoms at 1-month postnatal ($p = .049$, $d = 0.60$), while baby's low birth weight ($p = .07$, $d = 0.68$) was not significantly correlated but positively associated with medium effect size. However, the variable negatively correlated was a history of mental illnesses ($p = .00$, $d = 1.25$) (Table 1). Additionally, DE in maternity hospitals ($p = .07$, $d = 0.76$) and

TABLE 2 Changes due to the COVID-19 pandemic, and the rate and degree of perceived difficulty during the pregnancy ($N = 46$)

	Rate of experienced change due to COVID-19 <i>n</i> (%)	Perceived difficulty by the change		
		Rate of perceived difficulty	Degree of difficulty	
		<i>n</i> (%)	Mean (<i>SD</i>)	Range
Prenatal checkup	41 (89.1)	37 (90.2)	2.78 (1.06)	1–4
Preparation for her baby	39 (84.8)	37 (94.9)	2.68 (1.18)	1–4
Maternity hospital	6 (13.0)	6 (100)	2.67 (1.37)	1–4
Birth plan	20 (43.5)	20 (100)	3.00 (1.03)	1–4
Family's daily life	32 (70.0)	24 (75.0)	2.75 (1.07)	1–4
Social supports	17 (37.0)	16 (94.1)	3.44 (0.73)	2–4
Working style	29 (63.0)	18 (62.1)	2.61 (1.24)	1–4
Household finance	18 (39.0)	16 (88.9)	2.94 (1.18)	1–4

social support ($p = .09$, $d = 0.53$) were not significantly correlated but negatively associated with the SCS-J total with a medium effect size (Table 4).

3.4 | CP and CM

The CP of 45 participants and CM of 40 participants were analyzed. Based on the cluster analysis, participants were divided into “high” CP group ($n = 40$) or “low” CP group ($n = 5$) with mean scores of 18.05 (SD 2.18) and 10.00 (SD 0.71), respectively (Table 4). Similarly, they were divided into “high” CM group ($n = 29$) or “low” CM group ($n = 11$) with mean scores of 19.24 (SD 1.02) and 13.18 (SD 3.63), respectively. The numbers of low CP ($n = 5$) and CM ($n = 11$) were far fewer than the optimal sample size of one group ($n = 64$) in the next two-way ANOVA. However, these uneven numbers were not surprising because only participants with tragic attachment experiences such as child maltreatment may report quite low CP and CM and participants who have a good relationship with their partner, or their mother are more likely to have answered these voluntary items in the questionnaire. Therefore, during further analysis we were careful to interpret p values together with the effect size to consider a higher possibility of β error. Only CM ($p = .03$, $d = 0.64$) was positively correlated with the SCS-J total with a medium effect size.

3.5 | Moderating effects of CP and CM on the relationships between DE and self-compassion

The results of the two-way ANOVA after adjusting the two demographic variables, which were statistically correlated with SCS-J (perceived physical symptoms at

TABLE 3 The Japanese version of Self-Compassion Scale (SCS-J) scores and correlational analysis between subscales score and total score ($N = 46$)

	Mean (<i>SD</i>)	SCS-J total score	
		$r^{a,b}$	p
SCS-J			
Total score of 26 items	81.13 (16.75)	NA	NA
Mean score of each subscale			
Self-kindness	3.28 (0.94)	.70	.00**
Self-judgment	3.03 (0.97)	.73	.00**
Common humanity	3.05 (0.91)	.62	.00**
Isolation	3.40 (0.98)	.51	.00**
Mindfulness	3.25 (0.94)	.76	.00**
Over-identification	2.70 (0.97)	.69	.00**

^aSpearman's rank correlation coefficient was analyzed for SCS-J scores.

^bCohen's d : ≥ 0.20 as small, ≥ 0.50 as medium, and ≥ 0.80 as large effect size.

* $p < .05$. ** $p < .01$.

1-month postnatal and a history of mental illnesses), indicated a medium interaction effect size on SCS-J: CM*DE in preparation for the baby ($\eta^2 = 0.11$), CM*DE in the birth plan ($\eta^2 = 0.11$), and CP*DE in social support ($\eta^2 = 0.07$). Additionally, the results of simple slope analysis revealed that CM or CP levels show a tendency to buffer the relationships between DE and self-compassion postnatally (Figures 1–3).

4 | DISCUSSION

The findings from this study suggest that perinatal women who gave birth between September and November 2020 in Tokyo experienced multiple DEs during pregnancy,

TABLE 4 The relationships between self-compassion postpartum and other variables: difficult experiences with COVID-19 pandemic-related changes (DE) and compassion from family during pregnancy ($N = 46$)

	<i>n</i> (%)	Japanese version of the Self-Compassion Scale total score			
		Mean (SD)	<i>d</i> ^{f,g}	<i>p</i>	
Difficult experiences related to COVID-19 pandemic during pregnancy ^{a,b}					
DE in prenatal checkup					
Yes	37 (80.4)	81.08 (17.85)	0.01	.96	
No	9 (19.6)	81.33 (12.00)			
DE in preparation for her baby					
Yes	37 (80.4)	82.54 (18.03)	0.43	.09	
No	9 (19.6)	75.33 (8.23)			
DE in maternity hospital					
Yes	6 (13.0)	70.33 (12.72)	0.76	.07	
No	40 (87.0)	82.75 (16.80)			
DE in birth plan					
Yes	20 (43.5)	82.65 (18.65)	0.16	.61	
No	26 (56.5)	79.96 (15.41)			
DE in family's daily life					
Yes	24 (52.2)	81.17 (15.79)	0.00	.99	
No	22 (47.8)	81.10 (18.12)			
DE in social supports					
Yes	16 (34.8)	75.00 (15.21)	0.53	.09	
No	30 (65.2)	84.13 (17.00)			
DE in working style					
Yes	18 (39.1)	85.22 (15.80)	0.40	.18	
No	28 (60.9)	78.50 (17.09)			
DE in household finance					
Yes	16 (34.8)	76.00 (17.81)	0.48	.15	
No	30 (65.2)	83.87 (15.78)			
	<i>n</i> (%)	Mean (SD)			
Compassion from family during pregnancy					
Compassion from a partner ^c ($n = 45$)					
Higher compassion ^d	40 (88.9)	18.05 (2.18)	81.35 (16.46)	0.04	.95
Lower compassion	5 (11.1)	10.00 (0.71)	80.60 (22.47)		
Compassion from a mother ^e ($n = 40$)					
Higher compassion ^d	29 (72.5)	19.24 (1.02)	82.62 (17.39)	0.64	.03*
Lower compassion	11 (27.5)	13.18 (3.63)	72.64 (9.18)		

^aThe score of difficulty of each eight DE was calculated, including mothers who answered no change experienced in each, rated as 0.

^bThose who rated one or more on the score of difficulty were categorized as "Yes" while those who rated 0 were categorized as "No".

^cOnly answers from participants who could communicate with their partners during pregnancy were analyzed.

^dParticipants were divided into two groups of higher or lower compassion from family using cluster analysis.

^eOnly answers from participants who could communicate with their own mother during pregnancy were analyzed.

^fWelch's *t* test was conducted for the relationship between Japanese version of the Self-Compassion Scale and DE or compassion from family.

^gCohen's *d*: ≥ 0.20 as small, ≥ 0.50 as medium, and ≥ 0.80 as large effect size.

* $p < .05$. ** $p < .01$.

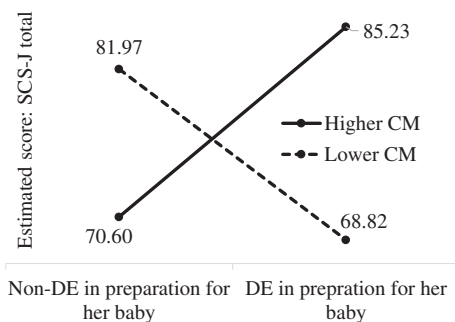


FIGURE 1 Interaction effect of difficult experiences with COVID-19 pandemic-related changes (DE) in preparation for her baby and compassion from the woman's mother (CM).

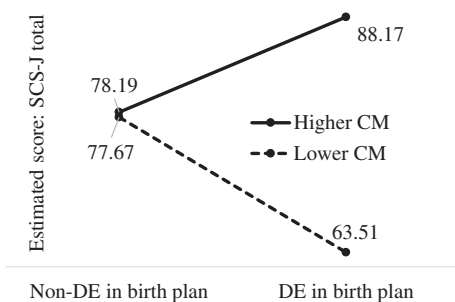


FIGURE 2 Interaction effect of difficult experiences with COVID-19 pandemic-related changes (DE) in birth plan and compassion from the woman's mother (CM).

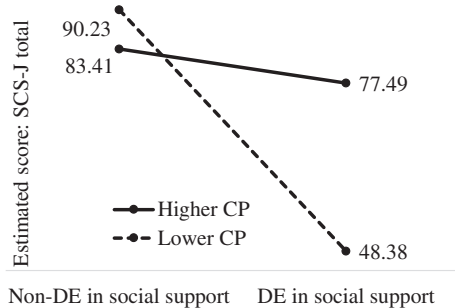


FIGURE 3 Interaction effect of difficult experiences with COVID-19 pandemic-related changes (DE) in social support and compassion from a partner (CP).

although the degree of these difficulties varied. This preliminary study partially supports our hypothesis that DEs, CP and CM during pregnancy may be correlated with self-compassion in 1-month postnatal women.

4.1 | Changes due to the pandemic and the degree of difficulty experienced by women

The findings regarding the rate of change and the degree of DEs suggests that most perinatal women during the

pandemic may experience compound DEs, and these are consistent with previous studies (Holmes et al., 2020; Kumari et al., 2020). Some pregnancy-specific issues, such as changes in maternity hospital and birth plan, were relatively uncommon but more likely to be perceived as difficult by the participants. This may be because these direct issues of childbirth are often the most crucial concern for pregnant women (Rubin, 1984). Meanwhile, although changes in the family's daily life and working style, such as overcrowded homes, may greatly impact women's everyday life (Holmes et al., 2020), such experiences were perceived as less difficult among the participants. This may be attributed to the participants' family structure as almost all participants were married but with relatively small families (i.e., more than a half were primiparas), so they might have felt less burdened by these changes. These emphasize that the impact of the pandemic should be investigated by considering whether it is a more direct issue to childbirth and, whether the actual burden can be managed through support from the family, as well as women's perception of the severity of difficulty. Therefore, further research and support programs for perinatal women during the pandemic may need to consider the everyday difficult experiences caused by the pandemic, as well as the relatively uncommon but intense difficult experiences.

4.2 | Relationship between DE and self-compassion in postnatal women

The tendency of a negative correlation for DE with changes in the maternity hospital and social support during pregnancy with self-compassion in the postnatal period may highlight the participants' insecurity over safe passage through pregnancy and childbirth, which is caused by social isolation.

The first DE, change in maternity hospitals, might have caused participants to feel insecure about safe childbirth because the maternity hospital is "a haven (i.e., a shelter) in the stress and danger of labor and delivery" (Rubin, 1984, p.56). The participants might have needed to change maternity hospitals due to inability to return to their parental home for childbirth, a Japanese custom that perinatal women in a nuclear family living in an urban area often choose. These participants had to choose a new maternity hospital during a critical time, immediately after the Japan Society of Obstetrics and Gynecology (2020) recommended against this traditional practice following the state of emergency being declared on April 21, 2020 as a result of the COVID-19 pandemic. This sudden change might have caused more distress

among participants because returning to the parental home for childbirth often provides various benefits such as social gatherings, ritual celebrations, and social support from the woman's family (Kumari et al., 2020).

The second DE, change in social support, might also have caused difficulties and uncertainties in the safe passage of pregnancy, childbirth, and childrearing among participants. The infection control strategies during the pandemic might have caused hesitation or a decrease in the use of social support, such as housework aid and childcare for other children during the pregnancy, in line with a previous study (Vescovi et al., 2021). Social support is a fundamental resource for perinatal women to accomplish safe passage through pregnancy and childbirth (Rubin, 1984). The perceived social welcoming of herself and her baby through support is also essential because it provides a sense of safeness for childrearing in future, and these social interactions are the fundamental milestones to acquire self-confidence as a mother (Rubin, 1984). A lack of social support among participants might have caused a sense of isolation, and an absence of safeness during and after the perinatal period.

The insecurity of safe passage followed by a lack of secure social interaction may be perceived as a critical threat to the woman's self-concept as a mother (Rubin, 1984). In response to this emotional distress, the participants might have experienced a strong and persistent stress response (i.e., self-judgmental thoughts, feeling isolated, and over-identification of suffering), which may have suppressed their compassion for themselves (Gilbert & Choden, 2014; Neff & Germer, 2018). Therefore, DEs about maternity hospitals and social support might have caused insecurity in pregnancy, childbirth, and childrearing in future, which might lead participants to struggle to be compassionate to themselves in the postnatal period.

4.3 | Influence of CM

The tendency of a positive relationship between CM and self-compassion in postnatal women may be attributed to a mother's soothing behaviors, followed by empathy. Although this finding can be attributed to the original parent-child relationship (Gouveia et al., 2018; Moreira et al., 2018) or the intergenerational transmission of compassion through modeling of parents' behaviors (Gouveia et al., 2018) before the index pregnancy, CM might also encourage the participants to be compassionate to themselves, because compassion can "flow" from self-to-other, other-to-self, and self-to-self (i.e., self-compassion) and interact in the social-interactional context (Kirby et al., 2019). In contrast, the tendency of buffering the negative correlation between DE in preparation for the baby

and birth plan and self-compassion in postnatal women as illustrated in Figures 1 and 2 can be explained by the features of these DE, which are typical issues to handle with their own mothers. Because grandmothers often provide infant care support through emotional, informational, and family support (Matsui & Sato, 2018), preparing for the baby might be the most relevant issue for women to handle together with their mothers. In some uncertain situations, such as the delivery, a perinatal woman may imitate her own mother as "the strongest model by virtue of the self-evident expertise" (Rubin, 1984, p.40-41). These DEs might increase communication between the participants and their mothers, which could be an important opportunity for the mother to express compassion to the perinatal woman. CM together with tangible support for infant care and upcoming experiences might reduce the new mother's stress response by assuring her that she and her baby are accepted, making them feel less isolated and more able to subjectively view their difficulties; thus, increasing self-compassion in the postnatal period.

4.4 | Influence of CP

The tendency of the buffering effect of CP on the negative correlation between DE in social support on self-compassion as illustrated in Figure 3 may suggest the importance of perinatal women's awareness of compassion from their partner. The compassion of a husband for his wife encourages supportive behavior and, accordingly, decreases the perinatal woman's burden (Collins et al., 2014). The partner's support during a problematic pregnancy is essential to maintain the perinatal woman's positive relations with others and belief in purpose in life to support psychological well-being (Ilska & Przybyła-Basista, 2020). The sense of safeness fostered by a partner's timely support and compassion may have contributed to soothing the participants' stress response to the emotional threats (Gilbert, 2020). It might accordingly allow the participants to be more compassionate toward themselves during difficulties caused by a deficiency of social support. Regarding differences in the effects of perceived compassion from a partner and mother, further investigations and discussions are warranted on whether influences on self-compassion would differ depending on family roles, gender, and ways of expressing compassion.

4.5 | Clinical implications

Despite the tremendous efforts of healthcare professionals, the influence of the COVID-19 pandemic could

extend over a long period in the future. Therefore, we need to reduce any pandemic-related changes which could be perceived as DE during pregnancy, especially changes in maternity hospitals and social support. Additional emotional support from healthcare professionals at maternity hospitals and within communities for mothers who could not visit their parental home or changed their intended hospital would be helpful. Enrichment and promotion of social support by healthcare professionals, such as aid in housework and childcare for a short period of time coupled with financial support, would help mothers feel secure. In the long term, we are also expected to develop a compassion-based intervention for the expecting mothers and their families, including their partners and their mothers, through online parental classes because compassion from family also acts as a crucial buffer against these difficult experiences during the pandemic.

5 | LIMITATIONS

Our study had a few limitations. First, the number of participants was too small owing to the relatively low response rate (27.1%), which may have resulted in low statistical power and the tendency for a β error. The recruitment was designed in a short period of time to target a population with similar circumstances regarding the COVID-19 pandemic, but the recruiting period coincided with a spike in the number of COVID-19-infected patients in Tokyo. Accordingly, the researchers decided to recruit participants through a brief oral explanation to minimize infection risk. Thus, participants might not have felt motivated to participate. Second, the results of this study may not be generalizable to the general pregnant population. Most participants of our study (97.8%) reported their household finance as above average, while awareness of insecurity in household finance was reported to be 38.8% in Japan in 2020 (Bank of Japan, 2021). The participants with higher economic status might have overcome their pandemic-related difficulties more easily due to financial stability; thus, the rate or degree of DE and self-compassion in this study might have been underestimated. Third, two possible recall biases might have influenced the results. Recalling prenatal experiences such as DE, CP, and CM after childbirth might have led to the underestimation of associations between the variables. The second recall bias might have arisen due to the levels of self-compassion. A higher level of self-compassion might have resulted in recognizing DE as less difficult because self-compassion helps to accept one's problems more adaptively and to avoid subsequent negative ruminations (Beduna & Perrone-McGovern, 2019).

Meanwhile, the participants with lower levels of self-compassion might avoid CP or CM recognition due to fears of receiving compassion. A lower level of self-compassion may be attributed to fears of receiving compassion rooted in the unsatisfied attachment experiences, which can also elicit fears of receiving compassion from others (Gilbert et al., 2011; Kirby et al., 2019). Finally, CP and CM were measured using newly created questionnaire items and from only the participants' perspectives, not the perspectives of the family members; thus, we were unable to understand compassion and its associated impact more precisely and objectively from multiple perspectives.

6 | CONCLUSION

Despite these limitations, the findings provide a brief report of the difficult experiences caused by the pandemic in Tokyo, Japan in 2020 and the possible impact on self-compassion among women in the postnatal period. This study also suggests that perceived compassion from their partners and mothers offers a possible buffering effect, although the effects varied depending on the kinds of difficult experiences. These findings may indicate a perinatal woman's need for cooperation with close family, such as their partners and mothers, to overcome uncertainty, and to feel a sense of security and compassion toward themselves. These findings highlight the importance of further research on the perception of difficult experiences caused by the pandemic among perinatal women and on the later psychological resources in motherhood (i.e., self-compassion), so that we can support pregnant women in overcoming challenging periods during the transition to motherhood.

AUTHOR CONTRIBUTIONS

Miyuki Muramoto, Sachiko Kita, Hiromi Tobe and Kiyoko Kamibeppu contributed to the conception and design of this study. Miyuki Muramoto performed the statistical analysis and drafted the manuscript; Sachiko Kita, Hiromi Tobe and Mari Ikeda critically reviewed the manuscript; and Kiyoko Kamibeppu supervised the whole study process. All authors read and approved the final manuscript.

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The Research Ethics Committee of the Graduate School of Medicine, the University of Tokyo approved this study (No. 2020201NI). This study has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments and informed consent has been sought from all

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CONFLICT OF INTERESTS

The authors have no conflicts of interest to disclose.

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