

Does Antenatal Fear of Childbirth Predict Postnatal Fear of Childbirth? A Study of Japanese Women

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Abstract

The study aimed to determine whether antenatal fear of childbirth (expectation) could predict postnatal fear of childbirth (experience) by taking account of other antenatal psychological variables (anxiety and depression) as well as birth outcomes in Japanese women. A longitudinal observational study was conducted at a clinic in Tokyo, Japan, in 2011. Self-report questionnaires were distributed to 240 Japanese women at 37 gestational weeks (Time 1) and on the second day after delivery (Time 2). Regression analyses by means of structural equation modelling were conducted in both the primiparous and the multiparous group. The models exhibited good fit (chi-square value/degree of freedom = 1.10 - 1.62, comparative fit index = 0.92 - 0.99 and root mean square error of approximation = 0.03 - 0.07). Antenatal fear of childbirth was the most predictive variable of postnatal fear of childbirth in both the primiparous ($\beta = 0.58$, $p = 0.002$) and the multiparous group ($\beta = 0.62$, $p < 0.001$). In conclusion, antenatal fear of childbirth was a significant predictor of postnatal fear of childbirth when other antenatal psychological variables and birth outcomes were taken into account. Pregnant women who are strongly afraid of childbirth need special attention before and after delivery.

Keywords

Antenatal Fear of Childbirth, Japanese Women, Postnatal Fear of Childbirth, Relationship

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1. Introduction

Childbirth can be both a challenging and a significant life event. Women may have positive and negative feelings towards the birth. A negative feeling can include fear of childbirth, which involves the child's health, pain, surgical interventions, a difficult course of labour, loss of control and isolation [1]-[3]. Antenatal fear of childbirth is defined as a negative experience of childbirth during pregnancy, while postnatal fear of childbirth is a negative experiences of childbirth brought by fear [4]. Women are afraid of risks to their own health such as haemorrhage, Ceasarean section and forceps/vacuum delivery as well as to that of the child such as being injured and distressed, which are due to the unpredictability of childbirth [3]. In addition, pregnant women are worried about losing control and being isolated during labour, which may lower their confidence and lead to a sense of failure [3].

In the UK and Nordic countries, severe antenatal fear of childbirth has been found in 11% - 15% of pregnant women [5] [6] some of whom report strong anxiety, fatigue, and sleep problems [7]. Such women are more likely to consider their childbirth experiences frightening [8] [9]. The negative experience brought about by fear (postnatal fear of childbirth) is associated with traumatic stress symptoms during the postpartum period [10]. Therefore, it is generally recognized that antenatal fear of childbirth can lead to adverse effects on the subjective birth experience and maternal mental state during the postpartum period. In order to reduce the risk of traumatic stress during this period, it is necessary to alleviate the fear of pregnant women who have a strong fear of childbirth before instead of after delivery.

Despite the above recommendation, there have been methodological limitations in previous studies aimed at demonstrating that antenatal fear of childbirth is a predictor of postnatal fear of childbirth. The Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ), which assess fear of childbirth, were compared before and after delivery by means of analyse of variance (ANOVA) among Swedish and Australian samples [8] [9]. These authors found that pregnant women in the high antenatal fear of childbirth group also had high postnatal fear of childbirth scores ($p = 0.61$). However, postnatal fear of childbirth may be associated with other psychosocial variables during pregnancy. First, women who reported strong general anxiety and depression during pregnancy tended to consider childbirth as a negative event [10] [11]. Second, invasive birth outcomes including emergency Caesarean section (emCS), instrumental delivery and prolonged labour have been found to increase negative feelings [12]. Therefore, it is necessary to consider other antenatal psychological aspects in addition to birth outcome.

Furthermore, there is little evidence of fear of childbirth among Japanese women. Antenatal and postnatal fear of childbirth might be influenced by the Japanese cultural context regarding childbirth. For example, the use of epidural anaesthesia is very rare in Japanese clinics and hospitals [13]. According to a previous survey among non-pregnant Japanese women, about 80% of them would prefer to deliver without anaesthesia [14]. Although several reasons can be considered, one is that Japanese women consider it valuable to experience and overcome labour pain before becoming a mother [14]. Thus the expectation and experience of childbirth among Japanese women may be qualitatively different to those in other countries.

Aim

The present study aimed to determine whether antenatal fear of childbirth can predict postnatal fear of childbirth by taking account of other antenatal psychological variables (anxiety and depression) as well as birth outcomes in Japanese women.

2. Material and Methods

2.1. Participants and Procedure

Healthy and Japanese women at 37 gestational weeks were invited to participate in the study by a researcher (M.T.) at an obstetric clinic in Tokyo, between July and November 2011. Women who were less than 20 years old, illiterate in Japanese, hospitalized because of major pregnancy complications or who suffered from serious mental illness were excluded. Women who had planned Caesarean sections were not recruited because the expectancy and experience related to childbirth would be totally different from those undergoing vaginal delivery. However, women who underwent emergency Caesarean sections (emCS) after the onset of regular labour were included, because they experience the delivery process in a somewhat similar way to women who deliver vagi-

nally. Of the 246 women recruited, 240 (97.5%) agreed to participate. They were asked to complete the first questionnaire at 37 gestational weeks (Time 1) and the second questionnaire on the second day after delivery (Time 2).

2.2. Observational Data at 37 Gestational Weeks (Time 1)

Data on age, the number of childbirth, education, lifetime prevalence of mental illness, complexity of the pregnancy (pregnancy-induced hypertension, experience of threatened premature labour and placenta previa) and anomalies in the development of the foetus (intrauterine growth restriction and foetal malformation) were obtained from medical records.

Antenatal fear of childbirth (expectation) was measured by the Japanese W-DEQ (JW-DEQ) version A [4] [15]. Women were asked to answer how they imagine at the moment their delivery will be. The scale consists of 33 items with six-point response alternatives per item, ranging from “not at all” (0) to “extremely” (5); the minimum score is 0 and the maximum 165. A higher score (over 85) indicates severe fear of childbirth and a score of over 100 is considered a phobia; thus, the scale can measure individual degrees of fear [4] and compare primiparous and multiparous women [4]. The JW-DEQ version A identified four factors; Fear, Lack of positive anticipation, Isolation and Riskiness [15], which are consistent with the English and Swedish versions [8] [16] [17]. The Cronbach’s alpha value was 0.95 [15].

General symptoms of anxiety and depression during pregnancy were measured by means of the Hospital Anxiety and Depression Scale (HADS). The original scale, developed by Zigmond and Snaith [18] was translated into Japanese by Kitamura *et al.* [19].

It consists of 14 items with two dimensions (Anxiety: seven items, and Depression: seven items) rated on a four-point scale, ranging from “strongly disagree” (1) to “strongly agree” (4). A higher score indicates a more intense level of general anxiety and depression. In the present study, the Cronbach’s alpha of the “Anxiety” subscale was 0.73 and that of the “Depression” subscale 0.60.

2.3. Observational Data on the Second Day after Delivery (Time 2)

Birth outcomes included emCS, vacuum delivery, induced delivery and duration of labour (hours). EmCS was defined as a Caesarean section performed after the onset of regular labour because the experience of childbirth differs between women who only have a planned CS and those who undergo both labour and an emCS.

Postnatal fear of childbirth (experience) was measured with the JW-DEQ version B [4]. Women were asked to answer how they think at the moment their delivery was. The translated JW-DEQ version B also identifies four dimensions consistent with the JW-DEQ version A. The Cronbach’s alpha coefficient was 0.94.

2.4. Statistical Analysis

Descriptive statistics were summarised as frequency distributions for categorical data and means and standard deviations for continuous data. For descriptive purposes, univariate statistics were obtained for the demographic characteristics by parity. Demographic data such as age and parity, the total HADS score, the total scores of the JW-DEQ versions A and B, in addition to birth outcomes such as duration of labour, emCS, vacuum and induced delivery, were correlated in order to examine their statistical associations (two-tailed statistical significance $p < 0.05$).

We employed structural equation modelling (SEM) rather than regression analysis because this statistical method is a powerful tool for identifying a hypothesised model of complex causal relationship patterns among variables based on observational data [20]. SEM makes it possible to confirm whether the hypothesised model is applicable to observational data and has the potential to differentiate between observed and latent variables, leading to conclusions that are more valid on the construct level. The two structural regression models differed between the primiparous and the multiparous groups, because women who had an emCS were included in the former [11]. Fear of childbirth factors were considered latent variables in the JW-DEQ versions A and B, which comprised: Fear, Lack of positive anticipation, Isolation and Riskiness [15] [16]. Antenatal fear of childbirth, anxiety, and depression during pregnancy (Time 1), which were determined as exogenous variables, correlated with each other. At the second measurement (Time 2), the exogenous variables duration of labour, vacuum delivery, and induced delivery also correlated with each other. The emCS was included in the primiparous model as an exogenous variable, which correlated with the variables related to birth outcomes. Postnatal fear of child-

birth determined as an endogenous variable was predicted by antenatal fear of childbirth, anxiety, depression, duration of labour, emCS (only in the primiparous group), vacuum and induced delivery.

These error variables reflect parts of each construct that cannot be explained by the observable variables that form the latent variables. In order to evaluate the fit of the model with the data, chi-square/degree of freedom (χ^2/df), comparative fit index (CFI) and root mean square error of approximation (RMSEA) were used as goodness-of-fit indices. According to conventional criteria, $\chi^2/df < 3$, CFI > 0.95 , and RMSEA < 0.08 indicate an acceptable fit while $\chi^2/df < 2$, CFI > 0.97 , and RMSEA < 0.05 indicate a good fit [21]. All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 20.0 and Analysis of Moment Structures (Amos) 20.0.

2.5. Ethical Approval

Ethical approval for this study was obtained from the Ethics Committee of the University of Tokyo (No. 3417, 2011). All participants were informed about the study, including the fact that anonymity and confidentiality were assured and that they could withdraw at any time by means of a written request.

3. Results

Seven (2.9%) of the 240 participants dropped out on the second day after delivery (Time 2) because they were too exhausted to complete the questionnaire. The response of another participant (which was more than 60% incomplete) was excluded from the analysis in order to maintain the quality of the data. Eight questionnaires (3.3%) that had one missing item were completed by the addition of the mean score of the items in question. There were no statistical differences in the demographic data and scores of the psychometrical measures between participants with and without one or more missing items. In this study, seven women (3.0%) had an emCS, all of whom were primiparas. Therefore, the data of 232 out of 240 participants' data (96.6%) were analysed. **Table 1** presents the characteristics of the sample.

The mean score (SD) of the JW-DEQ version A was 51.90 (19.47) for primiparas and 46.32 (23.98) for multiparas ($p = 0.03$). The mean score (SD) of the JW-DEQ version B was 64.25 (27.42) for primiparas and 42.30 (25.75) for multiparas ($p < 0.001$). Four pregnant women in each group (primiparas: 3.2%, multiparas: 3.2%) had severe fear of childbirth indicated by the JW-DEQ version A scores above 85. The average duration (SD) of labour was 8.25 (5.09) hours in primiparas and 4.48 (3.00) in multiparas ($p < 0.001$). Eleven primiparas (9.4%) and four multiparas (3.4%) had vacuum delivery ($p = 0.10$), while 47 primiparas (40.5%) and 11 multiparas (9.4%) had an induced delivery ($p < 0.001$).

Table 2 presents the correlations of variables. The total scores of the JW-DEQ version B had significant correlations with the factors in the JW-DEQ version A ($r = 0.56 - 0.65$, $p < 0.001$) and in the HADS subscales (Anxiety: $r = 0.42 - 0.43$, $p < 0.001$, Depression: $r = 0.30 - 0.41$, $p = 0.01$). In the primiparous group, the JW-DEQ version B had a significant correlation with vacuum delivery ($r = 0.33$, $p < 0.001$). In the multiparous group, the JW-DEQ version B had a significant correlation with duration of labour ($r = 0.22$, $p = 0.01$).

Figure 1 and **Figure 2** depict the results of the SEM (primiparous group: $\chi^2/df = 1.62$, $p = 0.001$, CFI = 0.92, RMSEA = 0.07, multiparous group: $\chi^2/df = 1.10$, $p = 0.28$, CFI = 0.99, RMSEA = 0.03).

In the result of the SEM regressions analysis, antenatal fear of childbirth ($\beta = 0.58$, $p = 0.002$) and vacuum delivery ($\beta = 0.24$, $p = 0.008$) had a statistical association with postnatal fear of childbirth in the primiparous group. In the multiparous group, antenatal fear of childbirth ($\beta = 0.62$, $p < 0.001$) and duration of labour ($\beta = 0.22$, $p = 0.002$) had a statistical association with postnatal fear of childbirth. General anxiety and depression during pregnancy did not predict postnatal fear of childbirth, whereas these variables and antenatal fear of childbirth had significant correlations with each other ($r = 0.31 - 0.74$, $p < 0.01$) in both groups.

In **Figure 1** and **Figure 2**, observational points were at 37 gestational weeks (Time 1) and two days after delivery (Time 2). Fear of childbirth was measured using each factor of the JW-DEQ version A (Time 1) and version B (Time 2). Statistically significant paths are in bold with a standardised path estimate. Non significant paths are with no path estimate shown. e stand for error variable.

4. Discussion

The present study demonstrated that antenatal fear of childbirth (expectation) was a significant predictor of

Table 1. Participants' characteristics.

	Total		Primiparas		Multiparas		<i>p</i> -value	
	n = 232		n = 116		n = 116			
	Mean ± SD	or n (%)	Mean ± SD	or n (%)	Mean ± SD	or n (%)		
Demographic data								
Age	33.69	±4.00	32.01	±4.10	33.94	±3.75	<0.001	^a
Education High school	17	(7.3)	6	(5.1)	11	(9.4)	0.653	^b
College	76	(32.7)	41	(35.3)	35	(30.1)		
University	139	(60.0)	69	(59.6)	70	(60.3)		
Planning to deliver with family	225	(96.9)	112	(96.5)	113	(97.4)	0.512	^b
History of psychiatric disorders	6	(2.5)	4	(3.4)	2	(1.7)	0.252	^b
Complexity of pregnancy	37	(15.9)	20	(17.2)	17	(14.6)	0.375	^b
Anomalies in development of foetus	7	(3.0)	4	(3.4)	3	(2.5)	0.363	^b
Birth outcomes								
Duration of labour (h)	6.37	±4.57	8.25	±5.09	4.48	±3.00	<0.001	^a
Emergency Caesarean section	7	(3.0)	7	(6.0)	0	(0)	0.01	^b
Vacuum delivery	15	(6.4)	11	(9.4)	4	(3.4)	0.100	^b
Induced delivery	58	(25.0)	47	(40.5)	11	(9.4)	<0.001	^b
Measures								
JW-DEQ ¹ version A	49.11	±21.97	51.90	±19.47	46.32	±23.98	0.031	^a
HADS ² anxiety	4.97	±3.61	4.82	±3.78	5.12	±3.45	0.522	^a
HADS ² depression	2.94	±2.08	2.89	±2.13	2.99	±2.05	0.731	^a
JW-DEQ ¹ version B	53.28	±28.73	64.25	±27.42	42.30	±25.75	< 0.001	^a

¹The Japanese version of the Wijma Delivery Expectancy/Experience Questionnaire (33 items, scored 0 - 165). Version A: antenatal fear of childbirth, Version B: postnatal fear of childbirth. ²The Hospital anxiety and depression scale (Anxiety: 7 items, scored 0 - 21; Depression: 7 items, scored 0 - 21). ^aStudent's t-test, ^bChi-squared test, Statistical significance: $p < 0.05$.

postnatal fear of childbirth (experience) when other psychological variables (general depression and anxiety) during pregnancy and birth outcomes (duration of labour, emCS, vacuum and induced delivery) were taken into account in primiparous and multiparous groups.

The results provide robust supports to previous findings that antenatal fear of childbirth is a predictor of postnatal fear of childbirth [6] [8]. In addition, Garthus-Niegel *et al.* [11] demonstrated the statistical association between antenatal fear of childbirth and negative birth experience by asking the mothers three ad-hoc questions (the content of subjective birth experience was fear, overall dissatisfaction and dissatisfaction with care) ($\beta = 0.44$, $p < 0.001$). The statistical association was stronger than that between birth outcomes and negative birth experience ($\beta = 0.25$, $p < 0.001$). Postnatal fear of childbirth can be categorised into one psychological aspect, namely negative birth experience. In our results, antenatal fear of childbirth is a better predictor of postnatal fear of childbirth than birth outcome. Thus, our results were similar to Gathus-Niegel's findings [11], although the measures of birth experience differed in content between this and the previous study [11]. However, we are unable to confirm that antenatal fear of childbirth is a strong predictor of negative birth experience than birth outcome because the majority of women in this study delivered normally. Nevertheless, we suggest that a psychological intervention as well as postnatal support are necessary for pregnant women who have a strong fear of childbirth before delivery.

Table 2. Statistical correlations (n = 232).

	1	2	3	4	5	6	7	8	9
1) Age	1								
2) JWDEQ ¹ version A	0.02	1							
3) HADS ² anxiety	0.03	0.60***	1						
4) HADS ² depression	0.07	0.46***	0.73***	1					
5) JWDEQ ¹ version B	0.09	0.56***	0.43***	0.41*	1				
6) Emergency Caesarean Section	0.03	0.00	0.07	0.02	0.16	1			
7) Induced delivery	-0.02	0.13	0.21*	0.16	0.16	0.08	1		
8) Vacuum delivery	0.26**	0.13	0.25**	0.29*	0.33***	0.16	0.21*	1	
9) Duration of labor	0.09	0.07	-0.05	-0.03	-0.00	-0.22*	-0.06	-0.04	1
	-0.04	0.00	0.03	0.02	0.22*		0.07	0.00	1

¹The Japanese version of the Wijma Delivery Expectancy/Experience Questionnaire (33 items, scored 0 - 165). Version A: antenatal fear of childbirth, Version B: postnatal fear of childbirth. ²The hospital anxiety and depression scale (Anxiety: 7 items, scored 0 - 21; Depression: 7 items, scored 0 - 21). Pearson's correlation, Upper: Primiparas, Lower: Multiparas, Statistical significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

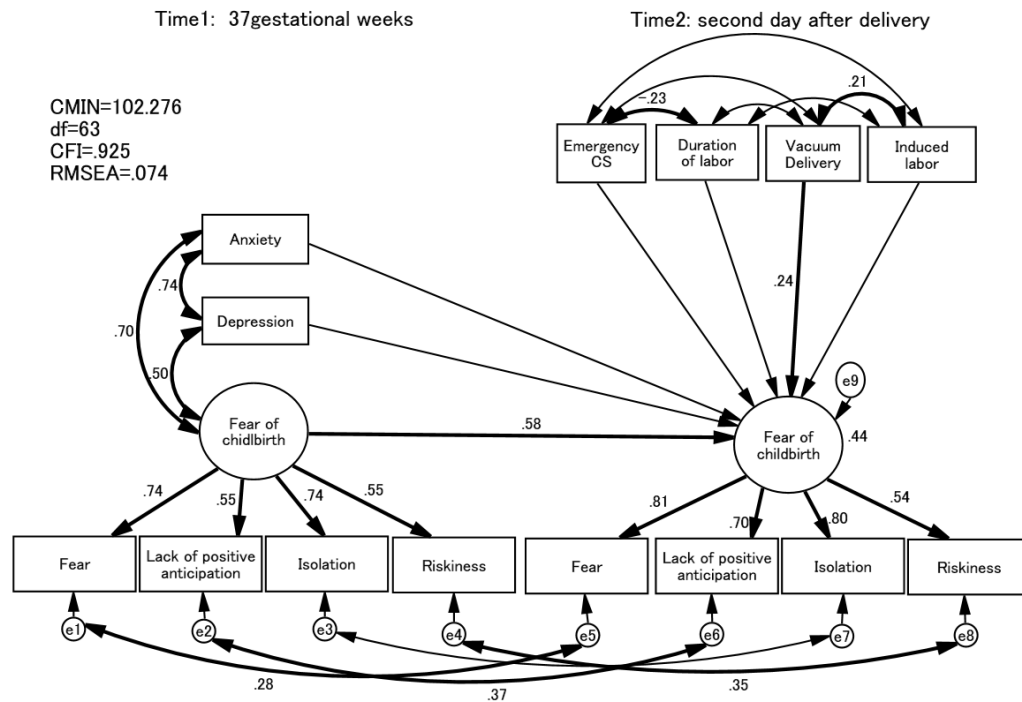


Figure 1. Structural regression model (Primiparas, n = 116).

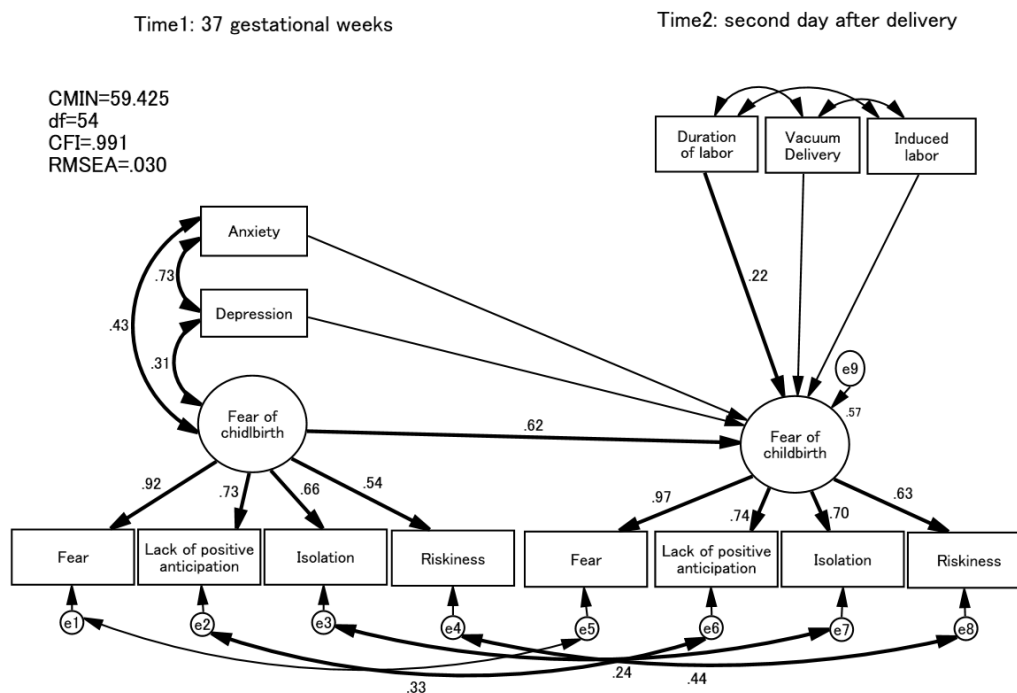


Figure 2. Structural regression model (Multiparas, n = 116).

With regard to birth outcome, vacuum delivery was the only significant variable associated with postnatal fear of childbirth in the primiparous group. Instrumental delivery is linked to negative birth experience, traumatic stress and emotional distress during the postpartum period because the delivery was an emergency procedure in response to foetal distress or failure to progress [22] [23]. Waldenström [24] stated that primiparous women had more positive expectations of childbirth than multiparous women, but had the disadvantage of complicated labour. Thus, primiparous women who unexpectedly underwent avacuum delivery may lose emotional control and experience intense fear during childbirth. On the other hand, emCS did not have significant associations with postpartum fear of childbirth ($p = 0.09$), which can probably be explained by the fact that the number of women who had an emCS was relatively small ($n = 7$) in this study. Another study with a larger number of participants is needed to confirm the results.

In the multiparous group, only duration of labour had a significant association with postnatal fear of childbirth. Most multiparous women expect that the birth will progress faster than their first delivery and do not lose their perception of time during labour as opposed to women in the primiparas group [24]. Therefore, when deliveries take longer than expected, they may feel anxious and fearful. In addition, negative experiences from a previous birth can affect them in different ways.

In the present study, antenatal fear of childbirth was the only psychological variable to predict postnatal fear of childbirth. This is because antenatal fear of childbirth concerns negative feelings specifically related to childbirth [4], while general anxiety and depression encompass negative feelings related not only to childbirth, but also to other negative life events such as minor problems associated with pregnancy and conflicts with family members. Thus, because of their broader concepts, it cannot be assumed that general anxiety and depression during pregnancy are factors that directly contribute to a negative birth experience. Nevertheless, general anxiety and depression during pregnancy were significantly correlated with antenatal fear of childbirth in the present results. Considering the fact that general anxiety and depression interacted with antenatal fear of childbirth, it seems reasonable to assume that pregnant women who have a severe fear of childbirth also exhibit intense general anxiety and depression during pregnancy, which leads to severe postnatal fear of childbirth.

This study has several limitations that need to be addressed. First, this study was conducted in just one setting and therefore the results cannot be generalized. The sample was composed of relatively healthy Japanese women, and their average scores (Mean \pm SD: 49.1 ± 21.9) of the JW-DEQ A were lower than those of Nordic women (62.8 ± 23.3) [5]. In addition, the small number of participants who underwent an emCS were only involved the

primiparas group, while the majority delivered normally. Although the sample is not representative of the total population of pregnant Japanese women, the results initially support the assumption that antenatal fear of childbirth rather than delivery methods is a predictor of postnatal fear of childbirth. A second limitation is that a larger sample with over 300 participants in each group would provide more robust results, although the present sample met the minimum SEM sample size criterion (>100) [21]. Thirdly, a negative birth experience contains a variety of concepts such as dissatisfaction, pain and fear [11] [25]. The present study explored postnatal fear of childbirth as one of the psychometric aspects of negative birth experience but other emotional aspects might need to be taken into consideration. A longitudinal follow-up study with a larger sample that examines various psychometric variables is necessary.

5. Conclusion

Antenatal fear of childbirth was found to be a strong predictor of postnatal fear of childbirth, when other antenatal psychological variables such as anxiety, depression and birth outcomes were taken into account. Thus, women who are strongly afraid of childbirth require special attention before and after delivery in order to cope with their childbirth experiences in a more positive way.

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