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Psychometric Properties among Japanese Women Based on the Multidimensional Assessment of Women's Experience of Childbirth

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Abstract

Aims/Background: Perceived experiences of childbirth are important for mothers as they affect their self-esteem, mother-child interactions, subsequent mother-child bonding, and their desire for another child. This study examined the factor structure and construct validity of Salmon and Drew's Multidimensional Assessment of Women's Experience of Childbirth (MAWEC) in Japanese. **Design/Methods:** This study conducted a questionnaire survey using the Japanese version of the MAWEC and other variables with 759 women with infants in Japan. The participants' mean (standard deviation [SD], range) age was 31.9 (5.3, 18 - 46) years. A total of 353 (46.5%) participants were primiparous and 384 (50.6%) were multiparous, and 22 (2.9%) did not answer. The data were randomly divided into two groups for exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) and separately analyzed the positive- and negative-worded items. I conducted EFA using the maximum-likelihood method with PROMAX rotation from one- through two- and three-factor structures. Different factor structure models were compared in terms of CFAs using, as indicator of goodness-of-fit, chi-square/df, comparative fit index (CFI), and root mean square of error approximation (RMSEA). **Results:** This study showed that a bifactor model for the MAWEC with four subscales (positive emotion, positive coping, negative emotion, and negative coping) fit the data the best. These four subscales were associated with demographic, obstetric, neonatal, and feeding characteristics. For example, primiparas were more vulnerable to coping aspects of perceived childbirth experiences, including sense of mastery over the delivery process and ability to enjoy the delivery. Gestational age at birth was associated with emotional aspects of perceived childbirth experiences. **Conclusion:** The Japanese

version of the MAWEC consists of four aspects regarding perceived childbirth experience. Perinatal health professionals may examine women's childbirth experiences from these four perspectives.

Keywords

Childbirth Experience, Factor Structure, Validity, Multidimensional Assessment, Japanese Women

1. Introduction

The childbirth experience affects mothers' self-esteem [1] and mother-child interaction [2] [3], mother-infant wellbeing and maternal perceptions of early infant temperament [4]. Positive childbirth experiences are important for all mothers, because they affect subsequent mother-child bonding [5] and desire for the next child [6] [7]. Many scales have been developed to assess childbirth experience. However, many are limited to specific emotions, such as anxiety or fear, or are only applicable to a specific mode of delivery, such as vaginal delivery (Childbirth Experience Questionnaire) [8] or Caesarean section (Maternal Satisfaction Scale for Caesarean Section) [9]. The Labour Agentry Scale focuses on the experience and expectations regarding control during childbirth [10]. The Wijma Delivery Expectancy/Experience Questionnaire version B focuses on the fear of childbirth [11]. The Oxford Worries about Labour Scale addresses labour and childbirth concerns [12]. The Childbirth Self-Efficacy Inventory focuses on self-efficacy and coping strategies during childbirth [13]. The Birth Satisfaction Scale-Revised is widely used but it covers not only perceived personal attributes (e.g., "ability to cope during labour", "feeling in control") and stress experienced during labour (e.g., "distress experienced during labour", "pain experienced") but also quality of care provision (e.g., "sufficient support", "relationships with health care professionals") [14]. Several scales are available in Japanese, such as the Self-Evaluation Scale for Experience of Delivery [15] and the Childbirth Experience Scale [16] for vaginal delivery, as well as the Japanese version of the Scales for Measuring Maternal Satisfaction [17] for Caesarean section.

Unlike other instruments that are limited to a specific group of mothers, the Multidimensional Assessment of Women's Experience of Childbirth (MAWEC) [18] covers a wide range of childbirth experiences, including all delivery modes [19]. The MAWEC is a self-report measure consisting of 20 adjectives rated on a 7-point Likert scale. It is based on data gathered from interviews with mothers to evaluate their childbirth experiences from multiple dimensions. The MAWEC has been extensively used as a measure to assess childbirth experiences and to evaluate and increase satisfaction with childbirth preparation programmes [20]. The MAWEC has also been applied to fathers [21] [22]. However, its subscale construction remains controversial. The original MAWEC is theory-driven and

has three components: fulfilment, distress, and difficulty [18]. The German version of the MAWEC [23], which is based on principal component analysis (PCA), has four components: fulfilment, good emotional adaptation, negative emotional experience, and physical discomfort. PCA conceptually differs from factor analysis (FA), which is preferred to identify the number and content of factors in the data [24]. The prior literature has underexplored the factor structure of the MAWEC. Therefore, this study aims to identify the best-fit factor structure of the MAWEC among Japanese women with infants.

Construct validity should be examined when developing psychological measures. If a tool measures what the researchers wish to measure, the scores should correlate with other variables that are theoretically associated with the measured construct. Childbirth experiences may be associated with a variety of variables. Primiparous women are more likely to negatively perceive childbirth experiences. Studies have reported that women's perceived childbirth experiences are not associated with educational level or age [25] [26]. Conversely, in Japan, higher education and lower age are associated with women's negative childbirth experiences [27]. The association between infertility and perceived childbirth experience has not been investigated. The World Health Organization's Care Guidelines for Positive Childbirth state that most women want a physiological (*i.e.* vaginal and full-term) birth [28]. Women who give birth by Caesarean section or instrumental vaginal delivery and who experience greater pain report more negative perceived childbirth experiences [26]. Partner support is not linked to perceived childbirth experiences [26]; however, some reports have shown that support from selected family members and friends increases women's satisfaction with their experiences compared to not having a companion during labour [29]. Rooming-in (*i.e.*, when the mother and baby stay together in the same room after the birth) may relate to perceived childbirth experiences, where either positive perception leads to rooming-in, or frequent rooming-in leads to better perceptions of birth experiences [30]. Meanwhile, neonatal outcome may affect maternal anxiety, depression, and stress, which, in turn, may influence how women reflect on their childbirth experiences [31]. Furthermore, perceived birth experience may influence the rate of breastfeeding. This is important as a previous study has indicated that non-breastfeeding mothers tend to experience more depression and anxiety than their breastfeeding counterparts [32].

2. Materials and Methods

2.1. Study Procedures and Participants

This cross-sectional study was conducted between October 2019 and August 2020. All 298 perinatal medical centres in Japan were invited to participate in this study, of which 8 facilities consented. Outpatient staff were asked to distribute 990 questionnaires to women who underwent a one-month post-delivery obstetric check-up. The inclusion criteria were women who had a live birth within the prior month. The exclusion criteria were women aged less than 18

years, those with severe mental disorders, and those with stillbirths. Of the patients approached, 84.9% (n = 841) voluntarily completed and returned the questionnaires. Questionnaires with missing data regarding any of the MAWEC items were excluded, resulting in 759 (76.7%) valid responses. The participants' mean (standard deviation [SD], range) age was 31.9 (5.3, 18 - 46) years. A total of 353 (46.5%) participants were primiparous and 384 (50.6%) were multiparous, and 22 (2.9%) did not answer. Furthermore, 227 (29.9%) participants had completed high school, vocational school or junior college (296: 39.0%), university (188: 24.8%), graduate school (21: 2.8%), and another type of education or did not answer (27: 3.6%). Moreover, 469 (61.8%) were employed (including on maternity leave), unemployed (289: 38.1%), and unknown (1: 0.1%). Of the participants, 455 (59.9%) had a vaginal delivery, vacuum extraction (69: 9.1%), emergency Caesarean section (85: 11.2%), planned Caesarean section (149: 19.6%), and unknown (1: 0.1%).

2.2. Measurements

This study used the Japanese version [33] of the MAWEC [18] [34] to measure the participants' perceived childbirth experiences using the question: "How do you feel about your childbirth?" Responses were provided using 20 adjectives rated on a 7-point Likert scale (e.g., disappointed = 1 and not disappointed = 7). Scores ranged from 0 - 120, with a higher score indicating a more positive perception of the childbirth experience. The MAWEC was translated into Japanese by Sato *et al.* [33]. This study recorded the participants' demographic information, including age, partner's age, educational level, and employment.

This study also obtained the participants' obstetric information, including number of pregnancies (including current), number of deliveries, gestational age at delivery, current delivery mode (vaginal, vacuum extraction, planned Caesarean, and emergency Caesarean), infertility treatment, perineal lacerations/wounds, attendance by family members during childbirth, and child's birth weight. Moreover, this study extracted participants' neonatal and feeding information, including rooming-in and feeding method (1 = exclusive breastfeeding, 2 = mainly breastfeeding, 3 = breastfeeding and formula feeding, 4 = mainly formula feeding, 5 = exclusive formula feeding).

2.3. Statistical Analyses

First, the data were randomly divided into two groups for exploratory factor analysis (EFA; n = 381) and confirmatory factor analysis (CFA; n = 378). As the MAWEC contains items with positive (e.g., "fulfilled" and "enthusiastic") and negative valence (e.g., "disappointed" and "depressed"), it may be subject to methodological bias [35] [36]. Moreover, a mixture of positive- and negative-worded items may lead to careless responses from participants [37]. Finally, an FA of reverse- and non-reverse-worded items combined may make the factor structure unstable and uninterpretable [38] [39]. In such cases, CFA often rejects the

one-factor model [40] [41]. Therefore, this study separately analysed the positive- and negative-worded items. Additionally, I calculated the mean, SD, skewness, and kurtosis of the MAWEC items using the EFA sample and examined the data factorability using the Kaiser-Meyer-Olkin (KMO) index and Bartlett's sphericity test [42]. Subsequently, I conducted EFA using the maximum-likelihood method with PROMAX rotation from one- through two- and three-factor structures. As the number of factors could be arbitrarily defined using EFA, this study compared the goodness of fit using a series of CFAs with the CFA sample [43] for cross-validation [44] [45] [46] [47]. Although there are several methods for determining the number of factors in an EFA-derived model [48], we used the χ^2 test, which begins with the most parsimonious 1-factor model and compares it to EFA-derived factor models. The model fit was examined using chi-square, comparative fit index (CFI), and root mean square of error approximation (RMSEA). Starting with the one-factor model, the most parsimonious, this study only accepted the subsequent model if the decrease of the χ^2 per df from the previous one was significant ($p < 0.05$). Moreover, this study deemed the absolute degree of fit with the data as good if the $\chi^2/df < 2$, CFI > 0.97 and RMSEA < 0.05, or as acceptable if the $\chi^2/df < 3$, CFI > 0.95 and RMSEA < 0.08 [49] [50] [51]. After identifying the best-fit factor structures of items with positive and negative valence that did not reach the required acceptance levels, this study conducted a bifactor CFA. I used SPSS ver. 28 and Amos ver. 27 for the analyses.

2.4. Ethical Considerations

This study was approved by the Institutional Review Board for Nursing Research in Iwate University of Health and Medical Sciences (approval number Iwa 19-1) and was conducted in accordance with the Declaration of Helsinki. The participants were given a leaflet explaining the study, and their written consent was obtained by completing and submitting the questionnaire. Participation was voluntary, and the participants were informed that refusal to participate would not affect them in any way, and that they could withdraw from the study at any time. The questionnaires were anonymous to protect the participants' privacy.

3. Results

Most items exhibited skewness < 2.0 and kurtosis < 4.0 (**Table 1**). Therefore, the items were used without modification in the subsequent analyses.

For the positive valence items, the KMO was .861 and Bartlett's sphericity χ^2 (91) was 2514.591 ($p < 0.001$). The EFA of the one-factor model indicated that most MAWEC items had factor loadings > 0.3 (except "easy" and "time going quickly"). In the two-factor model, seven items had high factor loadings for the first and second factors: "delighted", "happy", "satisfied", and so on, for the former, and "relaxed", "enjoyable", "in control", and so on, for the latter. The third factor of the three-factor model had no items with a factor loading > 0.3; therefore, it was deemed an unsuitable measurement model (**Table 2**). To identify the best-fit factor model for the positive valence items, this study conducted a CFA.

The two-factor model was superior to the one-factor model (χ^2 = 383.235 and 1017.306, respectively; *df* difference of 1; $p < 0.001$). The two-factor model was considered the best; however, its goodness-of-fit indices did not reach an acceptable level (CFI = 0.879, RMSEA = 0.104). The first and second factors of the two-factor model were interpreted as positive emotion and positive coping, respectively.

For the negative valence items, the KMO was .597 and Bartlett's sphericity χ^2 (15) was 295.846 ($p < 0.001$). Three items in the one-factor negative-valence model had factor loadings > 0.3. The first factor of the two-factor model loaded highly on "disappointed", "depressed", and "cheated", whereas the second factor loaded highly on "anxious", "painful", and "exhausted" (Table 3). The three-factor model was considered unsuitable as only one item ("anxious") was loaded highly on the third factor. Hence, the one- and two-factor models were compared using a CFA. The two-factor model was superior to the one-factor model (χ^2 = 43.006 and 84.764, respectively; *df* difference of 1; $p < 0.001$). Thus, the two-factor model was considered the best; however, it did not have acceptable fit with the data (CFI = 0.836, RMSEA = 0.108). The first and second factors of the two-factor model were interpreted as negative emotion and negative coping, respectively.

Table 1. Mean, SD, skewness, and kurtosis of the MAWEC items (n = 381).

	Item	Mean	SD	Skewness	Kurtosis
1	Disappointed	1.32	0.91	3.5	12.7
2	Fulfilled	5.98	1.89	−1.7	1.6
3	Enthusiastic	5.96	1.55	−1.6	1.9
4	Satisfied	6.24	1.54	−2.1	3.6
5	Delighted	6.61	1.34	−3.7	12.5
6	Depressed	2.05	1.75	1.6	1.3
7	Happy	6.65	1.26	−3.8	13.9
8	Excited	5.23	1.66	−0.7	−0.1
9	Good experience	6.55	1.19	−3.1	9.4
10	Coped	5.40	1.60	−0.8	−0.1
11	Cheated	1.36	1.16	3.7	13.1
12	In control	5.09	1.81	−0.6	−0.6
13	Enjoyable	5.08	1.92	−0.6	−0.7
14	Relaxed	4.70	1.87	−0.4	−0.9
15	Anxious	4.57	1.96	−0.4	−1.0
16	Painful	6.10	1.50	−1.9	3.1
17	Easy	2.38	1.74	1.1	0.2
18	Time going quickly	4.72	2.20	−0.5	−1.2
19	Exhausted	4.77	1.91	−0.5	−0.8
20	Confident	4.44	1.63	−0.2	−0.2

Table 2. EFA of positive-valence items (n = 381).

		1-factor	2-factor		3-factor		
		I	I	II	I	II	III
2	Fulfilled	**0.67**	**0.70**	−0.06	**0.77**	−0.08	−0.18
3	Enthusiastic	**0.74**	**0.67**	0.11	**0.70**	0.12	−0.10
4	Satisfied	**0.83**	**0.76**	0.15	**0.72**	0.18	0.08
5	Delighted	**0.82**	**0.92**	−0.12	**0.80**	−0.04	0.46
7	Happy	**0.77**	**0.89**	−0.16	**0.80**	−0.10	0.15
8	Excited	**0.41**	**0.42**	−0.02	**0.51**	−0.06	−0.22
9	Good experience	**0.70**	**0.68**	0.04	**0.74**	0.03	−0.18
10	Coped	**0.47**	0.16	**0.63**	0.18	**0.63**	−0.00
12	In control	**0.31**	−0.01	**0.64**	0.02	**0.63**	0.05
13	Enjoyable	**0.46**	0.06	**0.82**	0.10	**0.81**	0.01
14	Relaxed	**0.38**	−0.05	**0.88**	−0.04	**0.88**	0.09
17	Easy	−0.04	−0.25	**0.42**	−0.37	**0.48**	0.31
18	Time going quickly	0.09	−0.11	**0.40**	−0.17	**0.43**	0.15
20	Confident	**0.40**	0.12	**0.54**	0.17	**0.52**	−0.05

Note. Factor loadings > 0.3 are in bold.

Table 3. EFA of negative-valence items (n = 381).

		1-factor	2-factor		3-factor		
		I	I	II	I	II	III
1	Disappointed	**0.57**	**0.59**	0.10	**0.47**	−0.03	0.19
6	Depressed	**0.51**	**0.54**	0.04	**0.40**	−0.17	0.34
11	Cheated	**0.72**	**0.67**	−0.05	**0.93**	0.10	−0.14
15	Anxious	0.12	0.21	**0.52**	0.07	0.19	**0.65**
16	Painful	−0.21	−0.18	**0.72**	−0.11	**0.71**	0.07
19	Exhausted	0.01	0.06	**0.52**	0.10	**0.50**	0.07

Note. Factor loadings > 0.3 are in bold.

As the CFI of the two-factor models of the positive and negative valence items did not reach CFI = 0.95, this study used a bifactor model (**Figure 1**). As the MAWEC items could be divided into positive or negative expressions, the bifactor model considered the item content, specifically for the emotion and coping items. Moreover, this study added five error term covariances based on the modification indices: "happy" vs. "excited", "happy" vs. "good experience", "delighted" vs. "happy", "easy" vs. "time going quickly", and "painful" vs. "easy". The bifactor model showed a significant increase in fit with the data (CFI = 0.932, RMSEA = 0.062; **Table 4**). Based on the bifactor model, this study created four subscales: positive emotion, positive coping, negative emotion, and negative coping. All values were calculated by adding the scores of the items belonging to

each factor.

To confirm the construct validity of the four subscales, this study examined the associations between the subscale scores and other correlates (Table 5). As there were multiple comparisons, the alpha value was set as $p < 0.001$. There were no significant associations between the subscale scores and demographic features. Multiparas were positively and negatively associated with positive and negative coping scores, respectively, whereas primiparas were not. Gestational age was positively and negatively associated with positive and negative emotion scores, respectively. Infertility treatment was associated with lower positive coping scores. Vaginal delivery had the highest positive emotion and coping and lowest negative emotion and coping scores. Emergency Caesarean section had the lowest positive emotion and coping scores and the highest negative emotion scores. The presence of postpartum wounds negatively affected coping scores. Participants who were attended by family members had lower positive coping scores. Rooming-in was associated with positive and negative emotion scores. The breastfeeding ratio was not correlated with any subscale scores.

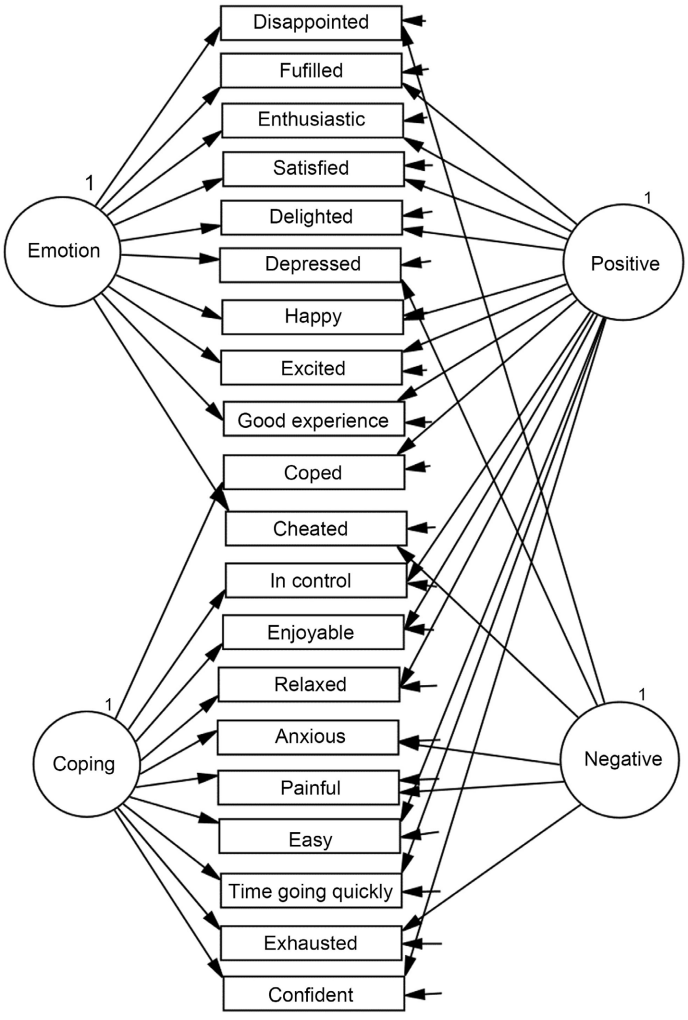

Figure 1. Model of psychometric properties based on the MAWEC.

Table 4. Factor loadings of MAWEC items in the four-factor bifactor model (n = 378).

	Item	Positive	Negative	Emotion	Coping
1	Disappointed		0.40***	0.11	
2	Fulfilled	0.57***		0.51***	
3	Enthusiastic	0.59***		0.58***	
4	Satisfied	0.67***		0.64***	
5	Delighted	0.55***		0.70***	
6	Depressed		0.54***	0.14	
7	Happy	0.65***		0.19*	
8	Excited	0.40***		0.04	
9	Good experience	0.76***		0.12	
10	Coped	0.56***			0.43***
11	Cheated		0.74***	0.02	
12	In control	0.34***			0.50***
13	Enjoyable	0.53***			0.66***
14	Relaxed	0.41***			0.76***
15	Anxious		−0.01		−0.35***
16	Painful		−0.19**		−0.14*
17	Easy	−0.09			0.44***
18	Time going quickly	0.19*			0.38***
19	Exhausted		−0.01		−0.38***
20	Confident	0.40***			0.33***

Note. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 5. Associations between the four MAWEC subscales and correlates (N = 759).

Correlates	Positive emotion	Positive coping	Negative emotion	Negative coping
Demographic features				
Mother's age	$r = -0.10$**	$r = -0.05$	$r = -0.07$	$r = 0.08$*
Partner's age	$r = -0.05$	$r = -0.02$	$r = 0.04$	$r = -0.04$
Education	$r = 0.01$	$r = -0.12$**	$r = -0.00$	$r = 0.03$
Obstetric features				
Number of pregnancies	$r = -0.07$*	$r = 0.21$***	$r = -0.03$	$r = -0.16$***
Number of deliveries	$r = -0.06$	$r = 0.27$***	$r = -0.05$	$r = -0.25$***
Gestational age at birth	$r = 0.15$***	$r = -0.03$	$r = -0.14$***	$r = 0.06$
Parity				
Primipara ($n = 353$)	43.3 (7.9)	29.1 (8.7)	5.0 (3.0)	16.4 (3.7)
Multipara ($n = 384$)	43.0 (8.1)	33.9 (8.0)	4.4 (2.8)	14.7 (3.9)
F	0.35	60.53***	6.72**	39.18***

Continued

Infertility treatment				
Yes (n = 119)	41.37 (10.2)	28.1 (8.7)	5.6 (3.8)	16.1 (3.6)
No (n = 639)	43.35 (7.7)	32.2 (8.5)	4.6 (2.8)	15.4 (4.0)
F	6.03*	23.80***	12.76***	3.13
Delivery style				
Vaginal delivery (VG, n = 455)	44.0 (7.8)	31.8 (8.7)	4.6 (3.0)	15.6 (3.9)
Vacuum extraction (VE, n = 69)	44.4 (6.7)	28.7 (8.7)	4.4 (2.6)	16.5 (3.5)
Planned Caesarean (PC, n = 149)	41.1 (8.7)	33.6 (8.0)	4.8 (2.9)	14.5 (4.0)
Emergency Caesarean (EC, n = 85)	40.2 (8.8)	29.0 (8.7)	5.7 (2.8)	15.5 (3.8)
F	9.11***	8.01***	4.11**	4.85**
Post hoc comparison	VG, VE > PC, EC	VG, PC > VE, EC	VG, VE < EC	PC > VE
Perineal laceration/wound				
Yes (n = 646)	42.7 (8.4)	30.9 (8.7)	4.8 (3.0)	15.8 (3.8)
No (n = 112)	44.8 (6.4)	35.1 (8.1)	4.1 (2.4)	13.8 (3.9)
F	6.37*	23.09***	5.05*	25.03***
Attended by family				
Yes (n = 355)	43.6 (7.8)	30.3 (9.2)	4.7 (3.0)	15.8 (4.0)
No (n = 397)	42.5 (8.4)	32.7 (8.1)	4.8 (2.9)	15.1 (3.8)
F	3.67	14.1***	0.10	6.78**
Baby weight				
<2500 g (n = 95)	42.1 (8.4)	33.1 (7.7)	5.1 (2.8)	15.1 (3.7)
>2500 g (n = 662)	43.2 (8.1)	31.4 (8.8)	4.7 (3.0)	15.5 (3.9)
F	1.49	3.16	2.25	0.70
Neonate and feeding features				
Rooming-in				
Yes (n = 693)	43.3 (8.0)	31.7 (8.7)	4.6 (2.8)	15.5 (3.9)
No (n = 62)	39.5 (9.5)	29.2 (8.2)	6.4 (3.7)	15.7 (3.9)
F	12.31***	4.8*	22.16***	0.34
Breastfeeding	r = −0.07	r = −0.06	r =0.12**	r = 0.07

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. SD are in brackets.

4. Discussion

This study identified four subscales of the Japanese version of the MAWEC: positive emotion, negative emotion, positive coping, and negative coping. These differ from the original English and German versions. This may be because the original and German versions used PCA, whereas this study used FA. PCA identifies the group of items that explain the largest variance of the scale whereas FA

identifies the factors behind the data. This study considered a combination of two partial general factors and created a complex bifactor model. Positive and negative emotion and coping factors represented the perceived pleasantness or unpleasantness of childbirth experiences. Positive and negative factors indicated comfort and discomfort or danger, respectively. Emotion factors were mainly positive, such as joy and happiness, with only three negative emotions: "disappointed", "depressed", and "cheated". Coping factors were perceived mastery of the environment, such as "coped" and "in control"; self-esteem, such as "enjoyable" and "confident"; energy, such as "relaxed" and "exhausted"; and perception, such as "pain" and "time going quickly". Hence, this factor combined cognition, physical conditions, and perceptions. Interestingly, "anxious" was regarded as a coping item. "Anxiety" may represent a negative aspect of perceived mastery of the environment, akin to worries or concerns. Evaluating the childbirth experience on the MAWEC scale could be used as a tool for postpartum reviews as it would objectively clarify the aspects of the birth experience that a woman most values.

These four subscales were associated with demographic, obstetric, neonatal, and feeding characteristics. Primiparas were more vulnerable to coping aspects of perceived childbirth experiences, including sense of mastery over the delivery process and ability to enjoy the delivery. Gestational age at birth was associated with emotional aspects of perceived childbirth experiences. Thus, emotional and coping aspects may be distinctive constructs. Nurses play an important role in providing appropriate information and communication, particularly in the case of premature births. This suggests that healthcare professionals should pay close attention to the emotional and practical needs of mothers with shorter gestational periods and should provide them with adequate support and resources to ensure a positive childbirth experience.

The findings regarding the effects of infertility treatment correspond with those of [52], who reported that women who gave birth using assisted reproductive technology might experience a negative impact on their identity as confident parents. It is possible that during the infertility treatment period, emotions, including those that arise from the result of experience of multiple unsuccessful attempts, may influence anxiety and self-confidence. Women who receive infertility treatments require particular attention to monitor their childbirth expectations. This study's results indicated that Caesarean sections, particularly emergency ones and the case for perineal laceration/wound experiences made mothers have negative perceptions towards almost all perceived aspects of childbirth experiences.

The attendance of family members during delivery was not related to better coping scores of perceived childbirth experiences. The WHO (p. 3) guidelines state that a "woman should have a companion of her choice throughout labour and childbirth" [28]. However, in Japan, even doulas often cannot be present in the delivery or operating rooms, as childbirth facilities limit attendance to family members. Thus, the presence of a family member was not positive in terms of a

positive coping experience. As such, midwives and nurses should check mothers' wishes in advance, allow them to make changes at any time, and confirm their intentions about the needs of attendees.

Rooming-in was associated with positive emotional aspects of perceived childbirth experiences. Mothers who could not spend time with their child for some reason may experience negative feelings, such as depression, disappointment, and anxiety. It is also plausible that while they could be happy or delighted to room together, they may not feel relaxed because they cannot rest as they have to nurse their babies. In short, they may feel ambivalent. Mothers who experienced healthy and ideal deliveries were likely to have positive childbirth experiences, whereas childbirths that did not proceed as expected were associated with negative emotional and coping experiences. The factors that influenced mothers' perceptions towards their childbirth experiences included not only the experience of labour pains, childbirth, or surgery, but also factors after childbirth, such as breastfeeding or rooming-in with their baby. Therefore, the factors that influence childbirth experiences are complex [26].

Using EFA and CFA this study identified four subscales that fit the data well. In future studies, a shortened version of the MAWEC should be considered for response convenience, as completing 20 items may be time consuming for postpartum mothers. It is also necessary to establish a cut-off point for women who need support, as this will clarify the need for special consideration and support that is clinically meaningful.

5. Limitation and Possibilities of This Study

The survey was limited to regional perinatal centres where Caesarean sections are performed. Hospitals and clinics account for about half and half of all births by delivery facility in Japan. This may not reflect the childbirth experience of low-risk women who give birth at clinics. It is possible that low-risk clinic births could have more markedly confirmed the relationship between the family and her baby. In addition, the women in this case may have been affected by COVID-19 during the course of the study, and may also have been affected by restrictions on visitation, but these were long-term effects and it was impossible to remove these conditions in this study. It is characterized by long postpartum hospital stays of 4 to 7 days in Japan, even when the length of stay is normal, but the effects on visitation continue to be felt today. I will carefully evaluate variables related to visitation in the future.

6. Conclusion

This study reveals that the Japanese version of the MAWEC is suitable to assess the childbirth experiences of Japanese women. Moreover, this study demonstrates that four subscales comprise Japanese women's childbirth experiences: positive emotion, positive coping, negative emotion, and negative coping. The scale allows midwives and nurses to objectively assess how a woman perceives

her birth experience using these four perspectives, so as to establish directions for support.

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Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board for Nursing Research in Iwate University of Health and Medical Sciences (Iwa 19-1, date of approval 30 August, 2019).

Informed Consent Statement

Informed consent was obtained from all participants involved in the study. Participation was voluntarily, and the participants provided consent to use non-personally identifiable data in reports and publications. The survey was anonymous, and no personally identifiable data were collected.

Data Availability Statement

The data set used and analyzed in the present study is available from the corresponding author upon reasonable request.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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