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# The current status of primipara's childbirth experience and its correlation with their reproductive intention: a cross-sectional survey study

Shan Huang<sup>1,2†</sup> , Mingyang Zhang<sup>3†</sup>, Xiaoping Luo<sup>1</sup>, Wenting Yang<sup>4</sup>, Shiyong Wang<sup>2</sup>, Jing Zhang<sup>5</sup> and Jinguo Zhai<sup>2,6\*</sup>

## Abstract

**Background** The childbirth experience of primipara profoundly impacts her future physical and mental health, reproductive intention, and choice of childbirth mode. This study aimed to explore the current situation of primipara's childbirth experience, to analyze the factors influencing negative childbirth experience, and to explore the relationship between childbirth experience and reproductive intention.

**Methods** A cross-sectional survey of a convenience sample of 522 primipara 1–5 days postpartum was conducted at five hospitals in Guangdong Province (May to July 2024). Data were collected using the General Information Questionnaire, the Social Support Rating Scale, the Childbirth Readiness Scale, the Caring Behaviors Inventory Scale, the Wijma Delivery Experience Questionnaire, and the Questionnaire on Reproduction Intention of Primipara.

**Results** The mean score of fear of childbirth was  $68.86 \pm 17.68$ . A total of 137 respondents met the clinical criteria for fear of childbirth ( $\geq 85$  points), indicating that 26.2% of primipara had a negative experience of childbirth. Binary logistic regression model showed that elderly primipara [odds ratio (OR) (95% confidence interval (CI)): 11.167 (2.737–45.559)], pregnancy comorbidities or maternal childbirth complications [OR (95%CI): 6.596 (3.046–14.287)], childbirth intervention [OR (95%CI): 6.168 (2.869–13.258)], and severe pain [OR (95%CI): 4.660 (2.197–9.882)] were risk factors for negative childbirth experience. Childbirth accompaniment [OR (95%CI): 0.081 (0.018–0.368)], high level of social support [OR (95%CI): 0.768 (0.704–0.839)], and high level of childbirth readiness [OR (95%CI): 0.878 (0.812–0.950)] protected against a negative birth experience. There was a negative correlation between the fear of childbirth score and reproduction intention scores.

**Conclusions** Childbirth accompaniment and high levels of social support and childbirth readiness can reduce primipara's perception of negative childbirth experience. Negative childbirth experience can reduce reproduction intention.

**Keywords** Childbirth experience, Primipara, Fear of childbirth, Reproduction intention, Influencing factor

<sup>†</sup>Shan Huang and Mingyang Zhang these authors contributed equally to this work and should be considered co-first authors.

\*Correspondence:

Jinguo Zhai

18022188007@163.com; helenjxzhai@gmail.com

Full list of author information is available at the end of the article



## Background

Childbirth experience refers to a woman's subjective experience of the birth process. It is a complex and multidimensional life experience that includes psychological and physiological aspects and is influenced by organizational, social, and environmental factors [1]. Childbirth is one of the most special and important experiences in a woman's life, which not only entails the birth of a new life but also represents an important process of physical and mental growth and transformation for the mother. Childbirth, as a stressor, poses a great challenge to women both physically and psychologically. The consequent stress response results in varying degrees of positive or negative effects.

A negative childbirth experience may induce anxiety, fear, depression, and other psychological problems [1–3], including maternal post-traumatic stress disorder [4–6]. Negative childbirth experiences may also adversely affect other aspects of the mother's social life. For example, depression and anxiety induced by a negative childbirth experience can adversely affect breastfeeding, parent-child attachment [7–9], and the health and development of children [10, 11]. In addition, a negative birth experience may lead to sexual dysfunction and affect the couple's life [12]. On the contrary, a positive birth experience enhances the mother's self-esteem and confidence in her new role [13] and strengthens her attachment to her newborn [14]. More importantly, a positive childbirth experience can enhance women's confidence in childbearing and stimulate their willingness to have children again [15]. A negative childbirth experience negatively impacts women's reproduction intention. It may lead to women's fear and rejection of fertility, thereby reducing their reproduction intention. A systematic review by Shorey et al. [16] found a positive correlation between negative birth experience and the decision not to have another child, the decision to delay childbearing, and the mother's request for a cesarean section in subsequent pregnancies. Thus, the maternal experience of childbirth is not only related to the well-being and stability of individual families but also has an impact on population development.

Currently, China is facing profound demographic changes characterized by a progressive decline in the fertility level and the population growth rate. The report of the 20th CPC National Congress underlined the need to optimize the population development strategy through policy interventions to support fertility [17]. The National Bureau of Statistics projected approximately 9.02 million births in China in 2023, corresponding to a birth rate of 6.39% and a natural population growth rate of -1.48% [18]. Data from the seventh national census indicate that the total fertility rate for women of childbearing

age in China was 1.3 in 2020, already at a low level [19]. These data underscore the need for concerted efforts to address the problem of population development. Reproductive intention determines reproductive behavior. In 2017, a national survey on reproductive intention found that only 27.3% of married women of childbearing age had already given birth to one child [20]. Research [21] shows that childbirth experience is an important predictor of women's willingness to have children again. In 2018, the World Health Organization (WHO) issued a document titled "Improving the Birthing Experience through Management during Childbirth". The document emphasizes the need for high-quality birthing care to improve the birthing experience and promote the health and well-being of mothers and babies [22]. Therefore, it is imperative to focus on the childbirth experience, a very important and special event in a woman's life.

The purpose of this study was to investigate the current situation of childbirth experience of primipara in Guangdong Province, analyze the factors influencing the negative childbirth experience of primipara, and explore the relationship between childbirth experience and the reproductive intention of primipara.

## Methods

### Design, setting, and participants

A convenience sample of 522 primiparas (1–5 days postpartum) were enrolled at 5 hospitals in Guangdong Province from May to July 2024. Data were collected by offline questionnaire survey. Before enrolment, all potential respondents were counseled about the purpose and significance of the study. Those who consented to participate in the study were handed out questionnaires by the team members in person and provided standardized guidance regarding the response methods. After obtaining their consent, the questionnaire was filled in. Mothers who encountered problems in filling out the questionnaire were provided one-on-one guidance on-site.

The inclusion criteria were as follows: (1) age  $\geq 18$  years; (2) primigravida; (3) ability to understand the questionnaire and express themselves normally; and (4) provision of written informed consent for voluntary participation in this study. The exclusion criteria were as follows: (1) mothers with a history of mental illness; (2) multiple births; (3) neonatal malformations; (4) mothers with severe underlying medical conditions, such as severe heart, respiratory, or blood diseases; and (5) mothers with stillbirths.

### Sample size calculation

The sample size was calculated using the formula  $N = z^2 \cdot p \cdot (1-p) / d^2$ , where  $N$  is the required sample size,  $p$  is the probability of negative childbirth experience.

Researchers selected a 95% confidence interval for the  $z$  value, and the corresponding value is 1.96.  $d$  is the tolerance error, generally taken as 10% or 20% of  $p$ . In this study, 20% of  $p$  was used. Nie [23] reported a 24.6% probability of a negative maternal childbirth experience. Thus, a sample size of 295 was calculated. Factoring 10% drop-out due to missing values, the minimum sample size for this study was 328. A total of 532 questionnaires were received, of which 10 questionnaires were excluded due to incomplete content. The final number of valid questionnaires was 522 (validity rate: 98.1%).

## Measurements

### Questionnaire on General Information

The general information questionnaire was designed by the researcher based on a literature review and contained two parts: maternal sociodemographic characteristics and obstetric-related information. Sociodemographic characteristics included 10 items such as maternal age, education, and marital status. Obstetric-related data included 10 items such as delivery time, pregnancy complications or complications, and delivery intervention. Social.

### Support Rating Scale (SSRS)

The scale was developed by Xiao [24] in 1986. The scale consists of three dimensions that assess the respondents in terms of subjective support, objective support, and utilization of social support. Questions 1 to 5 and 8 to 10 were scored on a Likert 4-point scale ( $A=1$ ,  $D=4$ ). Questions 6 and 7 were scored as 0 points if the answer was “no source”, and up to 9 points if the answer was “the following sources”. The total score of the questionnaire ranged from 12 to 66 points. The higher the score, the higher the subjective feeling of the individual’s perceived level of social support. The scale has good consistency and reliability for both the total score and the three dimensions, with overall Cronbach’s  $\alpha$  coefficients of 0.79–0.92, and consistency R1-10 of 0.79–0.92 for the various entries. Consistency R1-10 was 0.89 to 0.94.

### Childbirth Readiness Scale (CRS)

The Childbirth Readiness Scale was developed by Yuan et al. [25] to assess the level of maternal readiness for labor and delivery. The questionnaire consists of 18 items spanning 4 dimensions (self-management, information literacy, confidence in childbirth, and delivery planning). Each item was scored on a 5-point Likert scale from “strongly disagree” to “strongly agree”, with a total score of 18–90. Higher scores indicate higher levels of readiness for labor and delivery and better preparation for labor and delivery. The Cronbach’s  $\alpha$  coefficient for this scale was 0.967.

### Caring Behaviors Inventory (CBI)

The scale was developed by American scholar Wolf [26]. Chinese scholar Da [27] developed a Chinese version of this questionnaire in 2016. The Chinese caring behavior scale includes a total of 24 items spanning three dimensions: respect and connection, support and guarantee, and knowledge and skill. Each item is scored on a 6-point Likert scale (1 = never, 6 = always). This scale is used to evaluate nurses’ care for patients. The Cronbach’s  $\alpha$  coefficient of the overall scale is 0.959, and the Cronbach’s  $\alpha$  coefficients of the three dimensions are 0.897, 0.928, and 0.906, respectively. The retest reliability of the three dimensions are 0.794, 0.633, and 0.575, respectively.

### Wijma Delivery Experience Questionnaire (W-DEQ-B)

Wijma Delivery Expectancy/Experience Questionnaire was developed by Swedish scholars Wijma et al. [28] and introduced by Chinese scholars Liu et al. in 2015 [29]. The questionnaire has two separate versions, A and B. In this study, the Wijma Delivery Experience Questionnaire (W-DEQ-B) was used to investigate the childbirth experience of primipara on days 1–5 after delivery. W-DEQ-B consists of 33 items spanning 6 dimensions (fear, negative perception, helplessness, self-efficacy deficiency, lack of active participation, and worry about the safety of the newborn). The questionnaire was scored using a 6-point Likert scale (0 = completely, 5 = not at all). The negative items were scored in reverse. The total score ranged from 0 to 165 points. A score of  $\leq 37$  for the childbirth experience of primipara was classified as mild fear of childbirth, 38–65 as moderate fear of childbirth, 66–84 as high fear of childbirth, and  $\geq 85$  as severe fear of childbirth with clinical diagnosis. In this study, scores  $\geq 85$  were considered indicative of a negative childbirth experience. The Cronbach’s  $\alpha$  coefficient for this scale in this study was 0.849.

### Reproduction intention

Referring to the relevant research of domestic scholar Qing [30], the primipara were asked the following question after childbirth: “Do you have the will to give birth again?” The options were “definitely not” (score 1), “probably not” (score 2), “not sure” (score 3), “planning to have one” (score 4), and “planning to have two or more” (score 5).

### Statistical analysis

Data were double-checked and entered into EXCEL software. Data analyses were performed using SPSS23.0 software. The data were approximately normally distributed. The measurements were expressed as mean and standard

deviation while the counts were expressed as frequency and percentage. Correlation between variables was assessed using Pearson correlation analysis. Variables that were statistically significant in the one-way analysis ( $p < 0.05$ ) were included in the multifactor binary logistic regression equations, to analyze the influence of the first-time mothers' experience of childbirth factors.

## Results

### Basic characteristics

A total of 522 primiparas were surveyed. The majority of the participants were in the age group of 24–29 years (31.6%) and 30–34 years (28.2%). Most participants (53.4%) had a Bachelor's degree and 98.1% of the participants were married. During pregnancy, 63.4% of participants were working full-time. The family income level was relatively good, with 34.3% of primipara having a per capita monthly income of more than RMB 10,000. 75.5% of participants resided in urban areas. Of the 522 respondents, 95.2% had natural pregnancies, and most (80.7%) of the respondents had planned births. The percentage of respondents who were accompanied during labor was 19.9% (Table 1).

30.3% of respondents had pregnancy comorbidities or childbirth complications and 33.0% reported a history of adverse pregnancy; 52.1% of respondents were exposed to their newborns for more than 30 min after delivery. The overall condition of neonates was good, and a small proportion of neonates had Apgar scores of 4–7 (5.2%) and/or were admitted to the neonatal intensive care unit (NICU) (14.4%). During delivery, 43.9% of participants experienced a birth intervention. In terms of delivery mode, natural delivery was the main method (64.4%), while 35.6% of respondents gave birth by cesarean section. Drug analgesia and non-drug analgesia were used in 69.3% and 10.2% of respondents, respectively; 45.6% of respondents reported experiencing severe pain (Table 2).

### Childbirth experience of primipara

The mean score of fear of childbirth in this study was  $68.86 \pm 17.68$ . In terms of the degree of fear of childbirth, 4.21% of primipara showed a mild degree of fear, 29.50% showed a moderate degree of fear, and 40.04% showed a high degree of fear. One hundred and thirty-seven primipara showed a severe fear of childbirth, which indicated that 26.2% of primipara had a negative experience of childbirth (Table 3).

### Scores of reproductive intention, SSRS, CRS, and CBI

The mean score of SSRS was  $38.99 \pm 5.58$ , the mean score of CRS was  $80.17 \pm 5.88$ , the mean score of CBI was  $112.61 \pm 7.05$ , and the mean score of reproductive

intention was  $3.14 \pm 0.73$ . The mean scores of the various sub-dimensions of each scale are detailed in Table 4.

### Univariate analysis of different levels of childbirth experience in primipara

As seen in Table 1, among the sociodemographic characteristics of primipara, the following three variables were statistically significant: age, education, and whether or not accompanied at delivery. Among obstetric data, the following four variables were statistically significant: pregnancy comorbidities or maternal childbirth complications, first contact time for newborn, childbirth interventions, and pain level (Table 2). One-way analysis of negative childbirth experiences revealed significant differences in SSRS scores, CRS scores, and CBI scores (Table 5).

### Binary logistic regression analysis of childbirth experience in primipara

Multifactorial analysis of childbirth experience was performed by including statistically significant indicators ( $p < 0.05$ ) in the univariate analysis as independent variables and whether or not primipara's delivery experience was negative as a dependent variable in the binary logistic regression equation. The model construction was valid ( $p < 0.05$ ) and the Hosmer-Lemeshow test showed a good fit of the model ( $p > 0.05$ ). The results showed that the older the age, the more likely the primipara were to experience a negative childbirth experience, especially the elderly primipara, whose risk of having a negative childbirth experience was 11.167 times higher than that of the control group. Having a childbirth companion [odds ratio (95% CI): 0.081 (0.018–0.368),  $p < 0.01$ ], higher level of social support [OR (95% CI): 0.768 (0.704–0.839),  $p < 0.01$ ], and higher readiness for childbirth [OR (95% CI): 0.878 (0.812–0.950),  $p < 0.01$ ] were protective factors associated with negative childbirth experience. Having pregnancy comorbidities or maternal childbirth complications [OR (95% CI): 6.596 (3.046–14.287),  $p < 0.01$ ], having childbirth interventions [OR (95% CI): 6.168 (2.869–13.258),  $p < 0.01$ ], and severe pain [OR (95% CI): 4.660 (2.197–9.882),  $p < 0.01$ ] were risk factors for a negative childbirth experience (Table 6).

### Correlation between primipara's childbirth experience and reproductive intention

The results of Pearson correlation analysis showed a negative correlation between the scores of primipara's fear of childbirth and the scores of reproductive intention ( $r = -0.397$ ,  $p < 0.01$ ). Additionally, there was a negative correlation between the scores of all dimensions of childbirth experience and the scores of willingness to have another child, as shown in Table 7.

**Table 1** Sociodemographic characteristics of primipara and univariate analysis of different levels of childbirth experience (N = 522)

Variables	Number (%)	Negative childbirth experience (Percentage, %)		χ <sup>2</sup>	P
		No	Yes		
Age (years)				67.854 <sup>a</sup>	< 0.001**
< 24	103 (19.7)	92 (23.9)	11 (8.0)		
24–29	165 (31.6)	135 (35.1)	30 (21.9)		
30–34	147 (28.2)	111 (28.8)	36 (26.3)		
≥ 35	107 (20.5)	47 (12.2)	60 (43.8)		
Education				13.422 <sup>a</sup>	0.009**
Primary and below	5 (1.0)	3 (0.8)	2 (1.5)		
Junior high school	63 (12.1)	41 (10.6)	22 (16.1)		
High school or technical secondary school	159 (30.5)	106 (27.5)	53 (38.7)		
Bachelor's or college degree	279 (53.4)	224 (58.2)	55 (40.1)		
Postgraduate and above	16 (3.1)	11 (2.9)	5 (3.6)		
Marital status				3.628 <sup>a</sup>	0.057
Married	512 (98.1)	375 (97.4)	137 (100)		
Other	10 (1.9)	10 (2.6)	0 (0.0)		
Occupational status				15.614 <sup>a</sup>	0.111
Medical staff	37 (7.1)	36 (9.4)	1 (0.7)		
Teacher	61 (11.7)	40 (10.4)	21 (15.3)		
Police officer	28 (5.4)	21 (5.5)	7 (5.1)		
Bank staff	23 (4.4)	15 (3.9)	8 (5.8)		
Civil servant	23 (4.4)	18 (4.7)	5 (3.6)		
Staff of state-owned enterprises	37 (7.1)	26 (6.8)	11 (8.0)		
Self-employed	79 (15.1)	61 (15.8)	18 (13.1)		
Unemployed/laid off or unemployed	55 (10.5)	38 (9.9)	17 (12.4)		
Business/service personnel	48 (9.2)	34 (8.8)	14 (10.2)		
Private company staff	68 (13.0)	51 (13.2)	17 (12.4)		
Other	63 (12.1)	45 (11.7)	18 (13.1)		
Working status during pregnancy				1.239 <sup>a</sup>	0.538
Not working	121 (23.2)	85 (22.1)	36 (26.3)		
Part-time	70 (13.4)	54 (14.0)	16 (11.7)		
Full-time	331 (63.4)	246 (63.9)	85 (62.0)		
Per capita monthly household income (RMB)				2.164 <sup>a</sup>	0.339
< 5000	104 (19.9)	74 (19.2)	30 (21.9)		
5000–9999	239 (45.8)	172 (44.7)	67 (48.9)		
≥ 10,000	179 (34.3)	139 (36.1)	40 (29.2)		
Residential area				1.563 <sup>a</sup>	0.211
Urban	394 (75.5)	296 (76.9)	98 (71.5)		
Village	128 (24.5)	89 (23.1)	39 (28.5)		
Type of pregnancy				2.566 <sup>a</sup>	0.109
Natural pregnancy	497 (95.2)	370 (96.1)	127 (92.7)		
Assisted reproductive technology pregnancies	25 (4.8)	15 (3.9)	10 (7.3)		
Whether the pregnancy was planned				0.780 <sup>a</sup>	0.377
Yes	421 (80.7)	307 (79.7)	114 (83.2)		
No	101 (19.3)	78 (20.3)	23 (16.8)		
Whether or not accompanied at delivery				36.752 <sup>a</sup>	< 0.001**
Yes	104 (19.9)	98 (25.5)	6 (4.4)		
No	4186 (80.1)	287 (74.5)	131 (95.6)		

RMB Renminbi

\*p < 0.05; \*\*p < 0.01

**Table 2** Obstetric characteristics of primipara and univariate analysis of negative childbirth experience (N = 522)

Variables	Number (%)	Negative childbirth experience (Percentage, %)		$\chi^2$	P
		No	Yes		
Delivery time				5.125 <sup>a</sup>	0.163
06:01–12:00	154 (29.5)	119 (30.9)	35 (25.5)		
12:01–18:00	159 (30.5)	123 (31.9)	36 (26.3)		
18:01–00:00	123 (23.6)	84 (21.8)	39 (28.5)		
00:01–06:00	86 (16.5)	59 (15.3)	27 (19.7)		
Pregnancy comorbidities or maternal childbirth complications				134.372 <sup>a</sup>	< 0.001**
No	364 (69.7)	322 (83.6)	42 (30.7)		
Yes	158 (30.3)	63 (16.4)	95 (69.3)		
Adverse maternal history				3.515 <sup>a</sup>	0.061
No	350 (67.0)	267 (69.4)	83 (60.6)		
Yes	172 (33.0)	118 (30.6)	54 (39.4)		
First contact time for newborn				24.024 <sup>a</sup>	< 0.001**
≤ 30 min	250 (47.9)	209 (54.3)	41 (29.9)		
> 30 min	272 (52.1)	176 (45.7)	96 (70.1)		
Apgar score				3.091 <sup>a</sup>	0.079
8–10	495 (94.8)	369 (95.8)	126 (92.0)		
4–7	27 (5.2)	16 (4.2)	11 (8.0)		
Newborn admitted to the NICU				1.498 <sup>a</sup>	0.221
No	447 (85.6)	334 (86.8)	113 (82.5)		
Yes	75 (14.4)	51 (13.2)	24 (17.5)		
Childbirth intervention				108.252 <sup>a</sup>	< 0.001**
No	293 (56.1)	268 (69.6)	25 (18.2)		
Yes	229 (43.9)	117 (30.4)	112 (81.8)		
Delivery mode				0.142 <sup>a</sup>	0.706
Vaginal delivery	336 (64.4)	246 (63.9)	90 (65.7)		
Cesarean section	186 (35.6)	139 (36.1)	47 (34.3)		
Pain relief mode				2.984 <sup>a</sup>	0.225
Drug analgesia	362 (69.3)	259 (67.3)	103 (75.2)		
Non-drug analgesia	53 (10.2)	42 (10.9)	11 (8.0)		
Not adopted	107 (20.5)	84 (21.8)	23 (16.8)		
Pain level				62.363 <sup>a</sup>	< 0.001**
Moderate pain	284 (54.4)	249 (64.7)	35 (25.2)		
Severe pain	238 (45.6)	136 (35.3)	102 (74.5)		

Abbreviations: NICU Neonatal intensive care unit

\* $p < 0.05$ ; \*\* $p < 0.01$

**Table 3** The degree of fear of childbirth in primipara (N = 522)

Fear rating (scores)	Number	Percentage(%)	Mean $\pm$ SD
Mild ( $\leq 37$ )	22	4.21	30.91 $\pm$ 3.95
Moderate (38–65)	209	40.04	54.86 $\pm$ 7.08
High (66–84)	154	29.50	73.53 $\pm$ 5.06
Severe ( $\geq 85$ )	137	26.2	91.07 $\pm$ 5.82
Total	522	100	68.86 $\pm$ 17.68

Abbreviations: SD Standard deviation

## Discussion

In this study, 26.2% of primipara had a negative childbirth experience, which was higher than that in the study by Nie et al. [23]. The difference may be attributable to the fact that both primipara and multipara were included in Nie's study, whereas in the present study, only primipara were included. Several previous studies have shown that primipara are more likely to have a negative childbirth experience [31–33]. Because the cervix and pelvis are usually tighter in primipara, the process of dilation

**Table 4** The scores of SSRS, CRS, CBI, and reproductive intention among primipara

Item	Minimum value	Maximum value	Mean ± SD
SSRS	20	53	38.99 ± 5.58
(1)subjective support	11	28	21.34 ± 3.42
(2)objective support	3	16	10.15 ± 2.29
(3)utilization of social support	3	12	7.48 ± 1.51
CSQ	59	90	80.17 ± 5.88
(1)self-management	14	20	18.53 ± 1.50
(2)information literacy	16	30	25.22 ± 2.96
(3)confidence in childbirth	14	20	18.58 ± 1.45
(4)delivery planning	13	20	17.84 ± 1.73
CBI	90	128	112.61 ± 7.05
(1)respect and connection	29	55	43.89 ± 3.85
(2)knowledge and skill	16	30	25.51 ± 2.42
(3)support and guarantee	32	52	43.21 ± 3.35
Reproductive intention	1	4	3.14 ± 0.73

Abbreviations: SSRS Social Support Rating Scale, CRS Childbirth Readiness Scale, CBI Caring Behaviors Inventory, SD Standard deviation

**Table 5** Univariate analysis of negative childbirth experience in primipara (N = 522)

Item	Negative delivery experience(X ± S)		t/z	p
	No	Yes		
SSRS	40.93 ± 4.46	33.55 ± 4.78	16.33	< 0.001**
CRS	81.85 ± 4.87	75.45 ± 5.92	-10.362	< 0.001**
CBI	113.52 ± 11.83	110.05 ± 8.46	-4.497	< 0.001**

Abbreviations: SSRS Social Support Rating Scale, CRS Childbirth Readiness Scale, CBI Caring Behaviors Inventory

\*p < 0.05; \*\*p < 0.01

and stretching of the cervical canal during delivery can be more painful. Moreover, the delivery of a primipara usually takes longer than that of a multipara, which can make the childbirth process more difficult [34]. Additionally, primipara are likely to be more nervous and anxious due to their lack of childbirth experience, which can lead to a more negative sense of the childbirth experience. The mean score of fear of childbirth in this study was significantly higher than that reported by Fenaroli et al. [35] (23.46 ± 11.69), which may be related to the differences in the level of medical care and social environment in different countries. Moreover, Fenaroli et al. conducted a longitudinal study, and some of the respondents may have been assisted by appropriate healthcare providers before delivery. Therefore, their perceptions of negative childbirth experiences were lower.

In terms of socio-demographic characteristics, senior primipara showed a more negative childbirth of delivery,

consistent with the results of previous studies [36, 37]. This is because the physiological functions of high-age primigravida are significantly lower relative to their younger counterparts, mainly manifested in the decline of vaginal muscle elasticity and muscle strength in older women. This may make natural childbirth more difficult for elderly parturients, leading to prolonged or difficult delivery [38], and even complications such as postpartum hemorrhage and pelvic floor dysfunction [39, 40]. In this study, women who were accompanied by a family member in the delivery room reported a lower negative childbirth experience. Dubey et al. [41] showed that the support provided by a childbirth companion during delivery improves maternal and neonatal outcomes and helps reduce negative childbirth experiences of women. Soriano-Vidal et al. [42] also found that the absence of a partner during delivery was a predictor of a negative childbirth experience. Studies by Hong [43] and Wu et al. [44] have also shown that childbirth companionship significantly improves women’s physical and mental state during delivery and enhances the childbirth experience. The WHO’s Safe Childbirth Checklist also encourages the practice of childbirth companions as a means to improve maternal experience and safety during delivery [22]. Women who are accompanied by childbirth feel more psychologically supported and are more likely to express their needs during delivery, thus avoiding neglect. Previous studies [45, 46] have also shown that family presence during delivery is a key aspect of improving the speed of delivery and the treatment quality during delivery. A companion’s presence can also help bridge the communication gap between the mother and medical personnel.

In terms of obstetric characteristics, participants with pregnancy comorbidities or childbirth complications showed a more negative childbirth experience. Women with pregnancy comorbidities or childbirth complications may be at increased risk for delivery [47], placing a psychological burden on them and affecting the sense of the labor experience. Comorbidities or complications of pregnancy may also necessitate a change in the mode of delivery, necessitating a change from a normal delivery to a cesarean section, increasing maternal worry and anxiety. Studies have shown that when there is a certain gap between expectant mothers’ childbirth and reality, they tend to experience a sense of loss and a negative childbirth experience [48]. Pregnancy comorbidities or childbirth complications may also impact the maternal mental state, and even lead to post-traumatic stress disorder [49]. In the present study, birth intervention was also found to be a risk factor for negative birth experiences in primipara. This is because childbirth intervention is a psychological stressor for the mothers [50]. This

**Table 6** Binary logistic regression analysis of negative childbirth experience in primipara

Item	B	SE	Wald $\chi^2$	P	OR (95% CI)
Age (< 24)			16.024	0.001**	
Age(1)	0.424	0.662	0.409	0.522	1.527 (0.417–5.593)
Age(2)	1.252	0.658	3.625	0.057	3.498 (0.964–12.691)
Age(3)	2.413	0.717	11.314	0.001**	11.167 (2.737–45.559)
Education (primary and below)			2.819	0.589	
Education(1)	-0.285	1.423	0.040	0.841	0.752 (0.046–12.235)
Education(2)	-0.055	1.388	0.002	0.968	0.946 (0.062–14.370)
Education(3)	-0.672	1.395	0.232	0.630	0.511 (0.033–7.863)
Education(4)	-1.207	1.711	0.497	0.481	0.299 (0.010–8.553)
Accompanied at delivery room (no)	-2.514	0.773	10.585	0.001**	0.081 (0.018–0.368)
Pregnancy comorbidities or childbirth complications (no)	1.887	0.394	22.891	< 0.001**	6.596 (3.046–14.287)
First contact time for newborn ( $\leq$ 30 min)	0.581	0.386	2.268	0.132	1.788 (0.839–3.809)
Childbirth interventions (no)	1.819	0.390	21.714	< 0.001**	6.168 (2.869–13.258)
Pain level (moderate pain)	1.539	0.384	16.100	< 0.001**	4.660 (2.197–9.882)
SSRS	-0.263	0.045	34.823	< 0.001**	0.768 (0.704–0.839)
CRS	-0.130	0.040	10.603	0.001**	0.878 (0.812–0.950)
CBI	-0.053	0.028	3.638	0.056	0.949 (0.899–1.001)
Constant	17.871	4.537	15.513	< 0.001**	57686644.836

Dependent variable: negative childbirth experience

Abbreviations: SSRS Social Support Rating Scale, CRS Childbirth Readiness Scale, CBI Caring Behaviors Inventory, B regression coefficient, SE Standard error, p Statistical significance, OR Odds ratio

\*p < 0.05; \*\*p < 0.01

**Table 7** The relationship between the childbirth experience of primipara and reproductive intention

Item	Childbirth experience	Fear	Negative perception	Helplessness	Self-efficacy deficiency	Lack of active participation	Worry about the safety of the newborn	Reproductive intention
Childbirth Experience	1							
Fear	0.479**	1						
Negative perception,	0.897**	0.417**	1					
Helplessness	0.790**	0.266**	0.659**	1				
Self-efficacy deficiency	0.590**	0.072	0.340**	0.377**	1			
Lack of active participation	0.636**	0.415**	0.486**	0.368**	0.250**	1		
Worry about the safety of the newborn	0.547**	0.153**	0.351**	0.373**	0.375**	0.206**	1	
Reproductive intention	-0.397**	-0.260**	-0.351**	-0.386**	-0.191**	-0.192**	-0.210**	1

\*p < 0.05; \*\*p < 0.01

is consistent with the study by de Oliveira Paes et al. [51]. In particular, multiple vaginal examinations tend to aggravate the fear, pain, and shame of the mothers, with lasting psychological effects on the mother [51]. In addition, episiotomy, which is common in childbirth interventions, has been identified as a predictor of negative birth experiences [42]. In previous studies, women who delivered vaginally without an episiotomy experienced better delivery [48]. Therefore, due care should

be exercised to avoid unnecessary childbirth interventions during delivery. The level of pain perception during delivery is also closely related to the birth experience of primipara [52]. In the present study, severe pain during delivery was a risk factor for negative childbirth experiences. Pain makes it impossible for mothers to get rest and limits their activities during delivery, so they are prone to develop negative emotions [52]. In a qualitative study by Nie [23], the pain experienced during delivery



was shown to make the negative birth experience unforgettable, especially for those who gave birth naturally. However, there are large inter-individual differences with respect to childbirth pain. Mothers who have high expectations of pain relief, those who have witnessed or heard of negative childbirth pain experiences, and those with negative emotions before delivery are more likely to exhibit a negative childbirth experience [52]. Therefore, it is imperative to pay attention to women's perception of childbirth pain and adopt personalized pain relief strategies to mitigate their fear of childbirth and thereby improve the birth experience.

In the present study, a high level of social support was found to protect against negative childbirth experiences, which is consistent with the findings of Nie et al. [23]. Zhao et al. [53] also found that one-on-one midwifery support improves the mother's trust in the midwife and promotes cooperation during labor, which improves her comfort and sense of childbirth experience. Bäckström et al. [54] also demonstrated a positive impact of social support on the physical and psychological well-being of the mother, thereby reducing difficult, painful, and negative childbirth experiences. Therefore, social support for women during delivery is important to improve the birth experience. Adequate support from family, community members, and the healthcare team during delivery can improve the childbirth experience and outcomes.

In the present study, a high level of childbirth readiness was also found to protect against negative childbirth experiences, which is consistent with the results of a previous study [55]. Especially for women who have vaginal delivery, the more knowledgeable the woman is about the vaginal birth process, the better she feels about her delivery experience [56]. A better understanding of the childbirth process reduces the fear or anxiety of the mother, facilitating better cooperation with the medical personnel. The WHO also emphasizes that delivery preparation is an important component of antenatal care and plays an important role in reducing maternal mortality and improving women's childbirth experience [57].

The present study found a negative correlation between the score of reproductive intention and the score of fear of childbirth, which implies that the more fearful primipara are about childbirth, the lower their reproductive intention. In a study conducted in Italy, 5.9% of women said they would not have another child due to negative labor experiences during delivery [58]. Qiu et al. [59] found that 52.2% of parents who had a child after the 1980s did not want to have another child, and 23.6% were in the hesitation stage. Both quantitative and qualitative studies have demonstrated the adverse impact of negative childbirth experiences on women's willingness to have another child [60, 61], which is consistent with the

findings of this study. This is because women with a negative childbirth experience may be afraid of going through a similar experience again and worry about their safety as well as the well-being of their future children. This is liable to lead them to delay or give up childbearing, which will directly impact the population growth and structure and negatively impact the sustainable development of the country and society.

### Limitations

Some limitations of this study should be acknowledged. The study had a relatively small sample size and employed a non-probabilistic sampling technique. As a convenience sampling method was adopted, the hospitals selected were mainly the hospitals where the research team was located. Therefore, there are certain limitations regarding the distribution of hospital grade and location. More robust multicenter studies are required to obtain more definitive evidence.

### Conclusions

This study investigated the current status of childbirth experience among primipara women and its relationship with reproductive intention. High-age primigravida, comorbidities or pregnancy complications, childbirth intervention, and severe pain were identified as risk factors for a negative childbirth experience. Childbirth accompaniment and high levels of social support and childbirth readiness were protective factors for negative childbirth experience. A negative childbirth experience decreases the willingness of primipara to have another child. Therefore, concerted efforts are required to improve the labor and delivery experiences of women and create a safe and comfortable delivery environment. A good childbirth experience can help increase reproductive intention, which will help China's population development strategy.

### Abbreviations

WHO	World Health Organization
SSRS	Social Support Rating Scale
CRS	Childbirth Readiness Scale
CBI	Caring Behaviors Inventory
NICU	Neonatal Intensive Care Unit
OR	Odds Ratio
RMB	Renminbi
W-DEQ-B	Wijma Delivery Experience Questionnaire

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### Authors' contributions

SH conceptualized and designed the study. WY, JZ and SW were responsible for data recruitment and collection. MZ and XL were responsible for the analysis and interpretation of the data. JZ was responsible for the overall quality control, supervision, and review of the article. All authors read and approved the final manuscript.

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## Availability of data and materials

The datasets used or analyzed during the current study are available from the corresponding author upon reasonable request.

## Declarations

### Ethics approval and consent to participate

The Zhongshan People's Hospital Ethics Committee provided ethical clearance for this study (ethics number: 2024-049). Written informed consent was obtained from all participants prior to their enrolment. The study protocol complied with relevant guidelines and regulations.

### Consent for publication

Not applicable.

### Competing interests

The authors declare no competing interests.

### Author details

<sup>1</sup>Operation Anesthesia Department 1, Zhongshan City People's Hospital, Zhongshan 528403, China. <sup>2</sup>School of Nursing, Southern Medical University, No. 1023-1063 Sha Tai Nan Road, Guangzhou, Baiyun District 510080, China. <sup>3</sup>Operation Anesthesia Department 3, Zhongshan City People's Hospital, Zhongshan 528403, China. <sup>4</sup>Prenatal area, Zhongshan City People's Hospital, Zhongshan 528403, China. <sup>5</sup>Department of Obstetrics, Guangzhou First People's Hospital, Guangzhou 510180, China. <sup>6</sup>Shenzhen Hospital, Southern Medical University, 1333 Xinhua Road, Bao'an District, Shenzhen 518000, China.

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