

# The Prevalence and Predictors of Fear of Childbirth Among Pregnant Chinese Women: a Hierarchical Regression Analysis

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## Research Article

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# Abstract

**Background:** Fear of childbirth(FOC) runs through before, during and after pregnancy, which is harmful to both the pregnant woman and fetus. To identify the prevalence and predictors of FOC can help us generate strategies for alleviating women's FOC.

**Methods:** A cross-sectional study was conducted among a convenience sample of 646 pregnant women attending antenatal care at a subordinate hospital of an university in China. Data were collected using a Basic information form, Childbirth Attitude Questionnaire, Childbirth Self-Efficacy Inventory, and 10-item Connor-Davidson Resilience Scale. We conducted hierarchical regression analysis to explore the predictors of FOC and used a structural equation model to examine the direct and indirect associations between FOC, resilience and childbirth self-efficacy further.

**Results:** The average score on the Childbirth Attitude Questionnaire scale was 32.49 and the total prevalence of FOC was 67.1%. 45.4% women reported a mild level of fear, 19.5% reported moderate fear, and 2.2% reported a severe level of fear. The final regression analysis displayed six variables predicting FOC that explained 64.2% of variance in FOC: age ( $t=2.795$ ,  $P<0.05$ ), gestation age ( $t=2.566$ ,  $P<0.05$ ), parity ( $t=-5.191$ ,  $P<0.01$ ), spousal support ( $t=-6.119$ ,  $P<0.01$ ), resilience ( $t=-10.302$ ,  $P<0.01$ ) and childbirth self-efficacy ( $t=-16.435$ ,  $P<0.01$ ). Furthermore, childbirth self-efficacy mediated the relationship between FOC and resilience, and the mediation effect ratio was 53.5%.

**Conclusions:** A high prevalence of FOC among pregnant Chinese women was found in this study. Age, gestation age, parity, spousal support, resilience and childbirth self-efficacy were predictors of FOC. It is suggested that the health-care professionals should pay close attention to FOC and take targeted interventions according to these predictors especially resilience and childbirth self-efficacy.

## Background

FOC has been defined as a health issue for a pregnant woman related to an anxiety disorder or a phobic fear including physical complications, nightmares and concentration problems[1]. An increasing body of evidence suggests that FOC can affect their relationships with baby with baby, partner and family [2, 3], and often result in requests for obstetric analgesia and caesarean section[4–7]. What's more, FOC is also related to post traumatic stress disorder[8, 9] and a longer duration of labour[7, 10]. FOC is a common psychological problem for pregnant women. About 20% gravidas experienced FOC on the basis of existing studies[11, 12]. A meta-analysis has reported a 14% pooled prevalence of FOC, however, with significant heterogeneity[13]. It is quite normal for FOC to differ across countries owing that birth is an omnifarious experience.

Building on prior stuies, FOC is caused by multiple factors, including obstetric, sociodemographic and psychological features. Study on the effects of obstetric features on FOC has shown that parity[14], planned pregnancy[15] and gestational week[11] affect FOC. However, no connection was found between FOC and conception type[16, 17]. In terms of sociodemographic factors, previous studies found that

age[18, 19], educational level[20, 21], income level[19], and employment status[20, 21] are connected with FOC. Moreover, lack of social or spousal support were connected to increase probability of FOC[22, 23]. Among psychological issues, it's conceivable that childbirth self-efficacy is linked with FOC. The higher childbirth self-efficacy women reported, and the lower level they showed FOC[24, 25].

It is worth noting that resilience, proposed and developed by positive psychology and represents one's capability of survival and adjustment after experiencing serious traumatic events[26], can assist people to accommodate, handle or pass through the adversity based on a self-regulating psychological mechanism[27], and recover from disasters or keep psychologically health[28–30]. As FOC is a negative emotional experience, we speculate that resilience may have an impact on it. Also, research has stated that resilience influences self-efficacy[31, 32], and self-efficacy has been examined as a mediator in mental health outcomes[33]. Hence, we hypothesized that childbirth self-efficacy and resilience would have a direct effect on FOC, and resilience would have an indirect effect on FOC via childbirth self-efficacy.

For one thing, no study has included the impact of resilience on FOC and the relationships among FOC, childbirth self-efficacy and resilience of pregnant women till now. For another, the only two studies conducted by Chinese scholars examined the relative factors of FOC without including the extent to which these variables predict FOC[20, 34], and their results are not generalizable to the entire country. Taking all the mentioned reasons above into consideration, the main objective of this study is to identify the levels of FOC and evaluate its predicting factors among pregnant Chinese women. The specific purposes are listed as follows:

- (1) investigate the prevalence of FOC in Chinese women;
- (2) explore the correlations between FOC and sociodemographic, and obstetric features;
- (3) identify the relationships among FOC, childbirth self-efficacy, and resilience;
- (4) examine the predictors of FOC.

## Methods

### Design and participants

Chongqing is a municipality located in the southwest of China and has a population of approximately 31 million. The birth rate of the study hospital is over 9000 babies per year. The pregnant women who established the health records(gestational week  $\geq 11$ ) and attended routine prenatal examinations at the obstetrics clinic at the time of the research period were recruited. The inclusion criteria were Chinese pregnant women having a single fetus, being 18 years old and over, not having pregnancy complications, having no previous caesarean section and psychiatric disorders. The exclusion criteria were women who had signs of caesarean section and declined to participate in the survey. Three well-trained researchers

collected the data from August to December 2020. Excluding 39 respondents because of incorrect or incomplete responses and refusal, we analyzed the responses of 646 pregnant women.

## Measures

### Basic information form

Basic information form included eleven questions including age, educational, occupation, marital status, residence, income, gestational age, parity, planning pregnancy, conception type, spousal support.

### Fear of childbirth

Consisting of 16 items, Childbirth Attitude Questionnaire(CAQ) was developed to measure FOC[35]. Responses are structured by a four-point Likert scale, and Scores range from 16 to 64, with higher scores indicating higher FOC. The scale including four domains: fear of fetal health(F 1); fear of losing control during childbirth(F 2); fear of childbirth pain(F 3); fear of medical intervention and the hospital environment(F 4). CAQ total scores were categorized as none (16-27), mild (28-39), moderate (40-51) and severe (52-64). Wei wand her colleagues had translated the scale into Chinese, obtaining a good reliability and validity[36], and Cronbach's alpha was 0.92 in this study.

### Childbirth self-efficacy

The short form of 32-item Chinese Childbirth Self-Efficacy Inventory (CBSEI-C32) was used to measure childbirth self-efficacy. Outcome Expectancy Subscale (OE-16) and Efficacy Expectancy Subscale (EE-16) made up the CBSEI-C32[37]. Each item is answered on a ten-point Likert scale varying between 1 and 10. Total scores range from 32 to 320, the higher scores, the higher self-efficacy. The Chinese version of CBSEI-C32 has demonstrate high internal consistency (Cronbach's  $\alpha = 0.96$ ) and test-retest reliability (intraclass correlation coefficient = 0.88)[38]. The Cronbach's alpha for each subscale was 0.96 and 0.97 respectively in this study.

### Resilience

To measure resilience in pregnant Chinese women, we used the 10-item Connor-Davidson Resilience Scale (CD-RISC-10) in this study. Campbell-Sills and Stein created the original English version of the CD-RISC-10[39]. Then the scale was translated into Chinese and used to measure resilience in Chinese earthquake victims by Wang and his colleagues[40]. Responses are consisted by a four-point Likert scale, varying between 0("never") and 4 ("nearly always"), with higher total scores representing better levels of resilience. In this study, the Cronbach's alpha was 0.91.

### Statistical analysis

Mean and standard deviation (SD) were used to describe continuous variables and frequencies with percentages were used to summarize categorical variables. We performed an independent t-test and 1-way analysis of variance (ANOVA) to compare CAQ scores between different characteristics, and Pearson correlations analyses were conducted to testify relationships between FOC and self-efficacy, and

resilience. If above variables with  $P < 0.05$  in a t-test/ANOVA or Pearson correlation analyses, the variables were retained in the hierarchical regression analysis model. Cook's distances ( $< 1.0$ ) were computed to identify influential cases and outliers. The Durbin–Watson statistic was used to test independence of error terms and sequential correlation of adjacent errors. This statistic can range from 0 to 4, with a value of 2 indicating that the residuals are uncorrelated. The variance inflation factor (VIF) was applied to diagnose the possibility of multicollinearity among all the explanatory variables.  $VIF < 5$  declared that there was no serious multicollinearity. A  $p$  value of  $< .05$  was considered statistically significant. Data were recorded using Epi Data version 3.1 after checking for completeness and analyses were conducted using IBM SPSS Statistics version 25.

We performed the structural equation model (SEM) to analyze the mediation model. A model was established with FOC as the dependent variable, resilience as the independent variable, and childbirth self-efficacy as the mediating variable. Maximum likelihood estimation was employed as a global test of models. Bootstrapping method was used to test the significance of the indirect effect of a mediator. It is believed that an indirect effect was significant at the 0.05 level if the bias corrected (BC) 95% confidence interval (CI) from 5000 bootstrap samples without including 0. Amos 23.0 was used for SEM.

## Results

### Description of participants' basic characteristics and their correlations with FOC

Table 1 shows the sample's sociodemographic and obstetric features and their associations with CAQ scores. Ages of the sample varied between 18 and 42 years with a mean age of 28.7 (SD = 3.8). As for sociodemographic status, 529 (81.9%) had completed college education of the women included and most participants were employed (82.8%,  $n = 535$ ). The clear majority (98.9%,  $n = 639$ ) were married and lived in cities (91.5%,  $n = 591$ ). Half of the women had per capita family monthly income 4000–8000 RMB (50.9%,  $n = 329$ ) and majority of the women had partner full support for current pregnancy (85.8%,  $n = 554$ ). In terms of main obstetric information, mean gestational age was 29.6 weeks and 532 (82.4%) were nulliparous.

Table 1

Sociodemographic and obstetric characteristics of participants and their correlations with FOC (n=646).

Characteristics	N (%)	CAQ scores (Mean±SD)	F or t value	P Value
Age(years)			3.324	0.019
18-25	105(16.3)	33.61±9.22		
26-30	346(53.6)	32.38±8.30		
31-35	156(24.1)	31.24±8.32		
36-42	39(6.0)	35.51±10.40		
Educational			4.009	0.008
Junior middle school or below	31(4.8)	34.61±9.28		
Senior middle school or same level	86(13.3)	32.67±8.25		
University or Junior college	460(71.2)	32.80±8.56		
Master degree or above	69(10.7)	29.30±8.82		
Occupation			1.590	0.161
Office clerk	251(38.9)	33.06±8.56		
Executive staff/civil servant	36(5.6)	32.28±7.63		
Medical□educational and scientific personnel	139(21.5)	31.13±8.55		
Self-employed	39(6.0)	32.15±8.63		
Other	70(10.8)	31.49±8.99		
Unemployed	111(17.2)	33.75±8.92		
Marital status			2.496	0.013
Married	639(98.9)	32.41±8.60		
Other (Divorced/Separated/ Single)	7(1.1)	40.57±9.36		
Residence			1.483	0.228
Urban	591(91.5)	32.46±8.62		
Town	36(5.6)	31.44±8.98		
Rural	19(2.9)	35.58±8.53		
Per capita family monthly income (RMB)			0.015	0.985
¥4000	54(8.4)	32.31±9.17		

4000-8000	329(50.9)	32.49±8.56		
≥8000	263(40.7)	32.54±8.67		
Gestational age(week)			4.187	0.016
11-12	61(9.4)	30.16±9.37		
13-28	162(25.1)	31.67±8.33		
29-40	423(65.5)	33.14±8.59		
Parity			4.688	0.038
Nullipara	532(82.4)	33.22±8.68		
Multipara	114(17.6)	29.11±7.61		
Planning pregnancy			5.523	0.000
Planned	431(66.7)	31.25±8.83		
Unplanned	215(33.3)	34.98±7.69		

Continued Table 1

Characteristics	N (%)	CAQ scores (Mean±SD)	F or t value	P Value
Conception type			0.171	0.864
Spontaneous fertilization	613(94.9)	32.51±8.63		
Assisted fertilization	33(5.1)	32.24±9.05		
Prenatal spousal support			19.594	0.000
No support	6(0.9)	46.50±11.95		
Very few support	8(1.2)	43.38±11.80		
General support	78(12.1)	36.81±8.38		
Full support	554(85.8)	31.58±8.18		
Notes: RMB, Renminbi (Chinese Yuan)				

For their association with CAQ scores, *seven* factors were significantly related to FOC, regarding age( $F=3.324, P=0.019$ ), education( $F=4.009, P=0.008$ ), marital status( $t=2.496, P=0.013$ ), gestational age( $F=4.187, P=0.016$ ), parity( $t=4.688, P=0.038$ ), planning pregnancy( $t=5.523, P=0.000$ ) and spousal support( $F=19.954, P=0.000$ ).

# Levels of FOC and the correlations between FOC and self-efficacy, and resilience

The CAQ, self-efficacy, and resilience scale scores are shown in Table 2. Among a total of 646 participants, The prevalence of mild, moderate, and severe level of FOC were 45.4%(n = 293), 19.5%(n = 126), and 2.2%(n = 14), respectively. The mean CAQ score was  $32.49 \pm 8.64$ . The average CBSIE-32 score was  $201.44 \pm 58.69$ . The mean scores of the outcome expectancy and efficacy expectancy was  $100.38 \pm 30.02$  and  $101.05 \pm 30.01$  respectively. The mean scores of the CD-RISC-10 were  $26.51 \pm 5.83$ .

Table 2

Scores of CAQ, self-efficacy, resilience in pregnant women and Pearson correlation coefficients (n = 646)

Variables (Scales)	Mean	SD	FOC	Childbirth self-efficacy	Resilience
FOC(CAQ)			1		
Total score (range: 16–61)	32.49	8.64			
Childbirth self-efficacy (CBSIE-32)			-0.738**	1	
Total score (range: 54–320)	201.44	58.69			
OE-16 (range: 26–160)	100.38	30.02			
EE-16 (range: 23–160)	101.05	30.01			
Resilience (CD-RISC-10)			-0.638**	0.593**	1
Total score (range: 7–40)	26.51	5.83			
Notes: ** $P < 0.01$					

In the meantime, Table 2 also depicts the relationship among FOC, self-efficacy and resilience. Pearson correlation analyses demonstrated that CAQ scores were markedly inversely related to CBSIE-32 scores ( $r = -0.738$ ,  $P < 0.01$ ). FOC was also negatively correlated with resilience ( $r = -0.638$ ,  $P < 0.01$ ). Specifically, a positive correlation was found between childbirth self-efficacy and resilience ( $r = 0.593$ ,  $P < 0.01$ )

## The results of hierarchical regression analysis in predicting FOC

The results of the regression analysis related to the independent variables predicting FOC are depicted in Table 3. Because all VIF values less than 5, Multicollinearity was not found. Influential cases and outliers were also not be found (Cook's distances =  $0.00000 \times 0.15664$ ). Durbin–Watson value was 1.910, meaning that independence of error terms and sequential correlation of adjacent errors were not be discovered.

Table 3  
Regression analysis of variables in predicting FOC (n = 646)

Model	Predictors	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	<i>R</i> <sup>2</sup>	<i>F</i>	VIF
1	(Constant)	43.049	4.667	-	9.225**	0.177	20.800**	-
	Age	0.189	0.087	0.084	2.178*			1.167
	Educational level	-1.161	0.498	-0.087	-2.331*			1.086
	Marital status	4.665	1.993	0.085	2.341*			1.023
	Gestational age	0.092	0.032	0.102	2.831**			1.024
	Parity	-5.724	0.880	-0.253	-6.503**			1.183
	Planning pregnancy	3.711	0.675	0.202	5.497**			1.063
	Spousal support	-4.792	0.660	-0.263	-7.261**			1.024
	CD-RISC-10							
2	(Constant)	59.845	3.764	-	15.898**	0.491	78.898**	-
	Age	0.250	0.068	0.111	3.661**			1.170
	Educational level	-0.150	0.395	-0.011	-0.381			1.105
	Marital status	2.837	1.569	0.051	1.808			1.027
	Gestational age	0.068	0.026	0.075	2.641**			1.026
	Parity	-4.390	0.695	-0.194	-6.315**			1.194
	Planning pregnancy	2.222	0.536	0.121	4.145**			1.085
	Spousal support	-3.660	0.522	-0.201	-7.014**			1.037
	CD-RISC-10	-0.861	0.043	-0.581	-19.888**			1.081

Notes: \* $P < 0.05$  \*\* $P < 0.01$ .

Model	Predictors	B	SE	$\beta$	t	R <sup>2</sup>	F	VIF
3	(Constant)	64.939	3.171	-	20.476**	0.642	129.770**	-
	Age	0.161	0.058	0.071	2.795*			1.180
	Educational level	-0.277	0.331	-0.021	-0.836			1.105
	Marital status	1.850	1.317	0.034	1.405			1.029
	Gestational age	0.055	0.021	0.061	2.566*			1.028
	Parity	-3.055	0.588	-0.135	-5.191**			1.217
	Planning pregnancy	0.712	0.459	0.039	1.553			1.130
	Spousal support	-2.701	0.441	-0.148	-6.119**			1.055
	CD-RISC-10	-0.453	0.044	-0.306	-10.302**			1.587
	CBSIE-32	-0.074	0.004	-0.499	-16.435**			1.666

Notes: \* $P < 0.05$  \*\* $P < 0.01$ .

Obstetric and sociodemographic variables explained 17.7% of the variance in FOC ( $R^2 = 0.177$ ,  $F = 20.800$ ,  $P < .01$ ) in the first model. In the second model, the model explained 49.1% of the variance in FOC ( $R^2 = 0.491$ ) and the model was significant ( $F = 78.898$ ,  $P < 0.01$ ) with the addition of CD-RISC-10. Resilience was effective in explaining FOC ( $t = -19.888$ ,  $P < 0.01$ ). But education level and marital status did not predict FOC. In the third model, the model explained the variance in FOC increased 15.1% ( $R^2 = 0.642$ ) and the model was significant ( $F = 129.770$ ,  $P < 0.01$ ) when we included childbirth self-efficacy variable. Childbirth self-efficacy was a vital variable in predicting FOC ( $t = -16.435$ ,  $P < 0.01$ ). However, our data failed to demonstrate that planning pregnancy was relative to FOC. Education level and marital status did not predict FOC.

## Mediating effect of resilience on childbirth self-efficacy and FOC

Figure 1 depicts the mediation models of childbirth self-efficacy and the standardized coefficients for each variable. The SEM showed significant regression and correlation paths, with all the path coefficients statistically significant at the level of  $P < 0.05$ . The fit indices for the model were acceptable: Chi-squared = 259.254,  $df = 98$ ,  $\chi^2 = 2.645$ , RMSEA = 0.051, GFI = 0.951, AGFI = 0.932, NFI = 0.962, RFI = 0.953, IFI = 0.976, CFI = 0.976, PGFI = 0.685, PNFI = 0.786, PCFI = 0.797

According to the model, The FOC were significantly predicted by resilience and childbirth self-efficacy. The standardized direct effect value of childbirth self-efficacy on the FOC was  $-0.58$  ( $P < 0.001$ ), and the standardized direct effect value of resilience on the FOC was  $-0.33$  ( $P < 0.001$ ). Resilience significantly predicted childbirth self-efficacy, and the standardized direct effect value of self-efficacy on resilience was  $0.65$  ( $P < 0.001$ ). The bootstrapped 95% CI did not include 0 ( $-0.438$ – $0.316$ ,  $P = 0.000$ ), confirming the indirect effect of resilience on the FOC through childbirth self-efficacy was significant. The standardized indirect effect value of resilience on the FOC through self-efficacy was  $-0.38$ . The standardized total effect value of resilience on FOC was  $-0.71$ . Therefore, indirect effects account for 53.5% of the total effect.

## Discussion

### The prevalence of FOC

The mean score of CAQ in our study was 32.49. Compared the mean score with those from other countries, it's slightly higher than the studies that used the same assessment tool in China (32.20 and 31.30)[20, 34]. Our data showed that FOC occurred in 67% of pregnancies and 2.2% of participants experienced severe FOC. Several studies reported the following rates of severe FOC: 5% in Australia, 5.3% in Ireland, 6.1% in Iran, 8% in Kenya, 20.8% in Turkey and 24.5% in Ethiopia[41–46]. It seems difficult to compare the incidence of FOC cross countries due to different measures and definitions. But one conclusion we can draw is that FOC is a prevalent psychological problem among pregnant Chinese women, and most of them were at mild and moderate levels. It is high time that the healthcare professionals understand, recognize and intervene FOC

### Demographic and Obstetric factors predicting FOC

We performed hierarchical regression analysis to confirm the correlations of sociodemographic, obstetric, and other characteristics with FOC. The best-fit regression model revealed six variables that explained 64.2% of the variance in CAQ scores. Of the sociodemographic factors, age was found to predict FOC. Table 1 reflected that these older than 36 reported higher levels of FOC, which came to agreement with previous study in Finland[19]. This may have something to do with their belief that advanced age makes them unfit to give birth. While Laursen et al.[18] demonstrated young women  $< 20$  years reported intense FOC in a study from Danish. In additional, spousal support also plays an important part in affecting FOC and lacking of spousal support predicted an increased incidence of FOC.

Among obstetric features, gestational age and parity are significant in predicting FOC. As the gestation week increases, the higher level of FOC was more likely to be reported, keeping in line with a previous study[47]. On the contrary, Laursen et al[18]. testified that levels of FOC decreases from the second to the third trimester in their cohort study. Similar to other studies[47, 48], multiparas have lower levels of FOC than primiparas women did. We would venture to guess that the reason may lie in the fact that primiparas participate in the delivery process for the first time, lack of relevant childbirth cognition and experience, and are not fully prepared psychologically in the face of childbirth events. But previous work

by Räisänen et al stated that multiparous women had higher risk to experience FOC[19], in which case FOC is usually concerned with a previous traumatic or negative childbirth experience[49, 50].

From the discussion above, we can see obviously that different studies show conflicting results regarding the association between the FOC and sociodemographic, and obstetric factors. For the current study, however, the sample sources are relatively limited to achieve adequate power to explore the difference with this issue, and more specific research is necessary to examine their association. Even here though, it is of great significance to design antenatal educational programs specifically for different demographic and obstetric backgrounds.

## **Resilience**

When we added resilience to the model in the second step, the model explained 49% of the variance in FOC, indicating that resilience plays a significant part in predicting FOC. In terms of resilience, an increasing body of evidence suggests that resilience serves as a protective factor for psychological health and overall well-being[51, 52]. Although childbirth is a normal and healthy life experience, pregnant women with FOC may regard it as challenges and adversity. Resilience helps individuals cope with these adversities and difficulties, So we think that pregnant women with better level of resilience may manage emotion successfully, actively use their own psychological qualities to cope with the stress response of childbirth, and ultimately reduce fear. In a Chinese study involving 2813 pregnant women, resilience was found to have independently protective effect on prenatal anxiety/depression significantly[53]. All research showed that resilience has strong practicability, and researchers are advised to focus on the intervention of resilience and the formulation and implementation of programs to enhance resilience. It is commanded that we apply the theory of resilience to health education during pregnancy to explore the effective training methods of resilience for pregnant women, so that pregnant women can better cope with the pressure of childbirth and alleviate FOC.

## **Childbirth self-efficacy**

The explained variance in FOC increased to 64.2% when we included self-efficacy to the model in the third step. It was clear that childbirth self-efficacy is a veritable tower of strength in predicting FOC. On the one hand, self-efficacy reflects personal beliefs about behavior that influence outcomes[54]. On the other hand, self-efficacy is the individual's confidence that they can succeed in performing that behavior in a realistic case[55]. Women with low level of self-efficacy may exaggerate the difficulty of a natural birth and have lower confidence to cope with the birth process. Previous studies have reflected that low self-efficacy is in connection with severe FOC[45, 56].

Another interesting finding of this study is that we found mediating effect of childbirth self-efficacy in the relationship between resilience and FOC. In other words, a better level of resilience brought out stronger self-efficacy, which in turn reduced CAQ score. The mediation effect ratio was 53.5% confirming that resilience indirectly acted on FOC through self-efficacy. The reason may be that pregnant women with higher resilience may enable them to make full use of their psychological resources to arouse and strengthen mental potential to accept birth event and reevaluate it, and this in turn would be beneficial for

them to have greater confidence in giving birth, thus reduce fear. These findings shown that preventive interventions aimed at enhancing self-efficacy and resilience may be conducive to alleviate pregnant women's fear effectively.

## **Conclusions**

In sum, we found a high prevalence of FOC among pregnant women in China. Health care professionals are supposed to attach importance to FOC and address this issue in detail. Age, gestational age, parity, spousal support, resilience and childbirth self-efficacy are the predictors of FOC in pregnant Chinese women. The findings help us to identify the characteristics of patients with FOC and to formulate corresponding countermeasures. Another point to note is that interventions focusing on enhancing resilience and self-efficacy may alleviate FOC.

## **Strengths And Limitations**

There are some strengths to this study. In the first place, bringing the relation between FOC and resilience into the light may be taken as a strength of the study as there are no relevant studies. And in the second place, it suggested a mediation model, showing that self-efficacy mediated the relationship between FOC and resilience.

As for limitations, firstly, this study was conducted in a university affiliated hospital in a large urban area, which may not allow the current results to represent all pregnant Chinese women. Further research should focus on women in rural and remote communities. Secondly, because this study was a cross-sectional research, conclusions about causality between FOC and related factors could not be derived. Thus, future prospective studies are requested to be carried out.

## **Abbreviations**

FOC: fear of childbirth; CAQ: Childbirth Attitude Questionnaire; CBSEI-C32: the short form of 32-item Chinese Childbirth Self-Efficacy Inventory; CD-RISC-10: the 10-item Connor-Davidson Resilience Scale; OE: Outcome Expectancy Subscale; EE: Efficacy Expectancy Subscale.

## **Declarations**

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### **Availability of data and materials**

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

### **Authors' contributions**

JG H conceptualized and designed the study, collected the data, logged and analyzed the data, and drafted the manuscript. JH participated in the study design, collected the data, checked the data. YL contributed to data acquisition, read the entire manuscript critically and proposed suggestions on revision. BZ L guided the study design, directed and revised the manuscript. All authors read and approved the final manuscript.

### **Ethics approval and consent to participate**

Approved by the Human Research Ethics Committee in the First Affiliated Hospital of Chongqing Medical University (2020-478), this study meets the ethical guidelines of the Declaration of Helsinki. Written informed consent was obtained from participants prior to their participation in the study.

### **Consent for publication**

Not applicable

### **Competing interests**

No competing interests were reported by the authors.

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## Figures

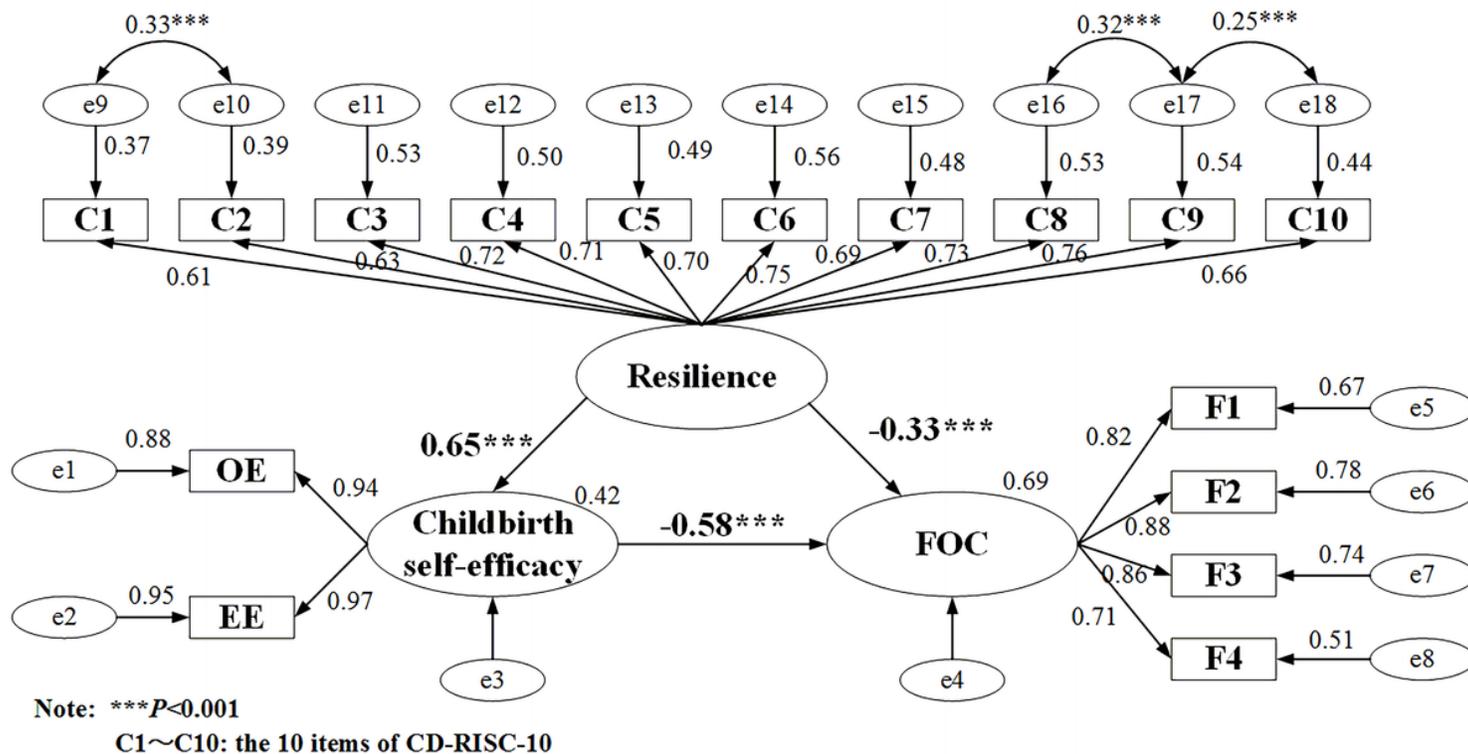


Figure 1

The mediation model of childbirth self-efficacy on resilience and FOC(N= 646)