

# Comparisons on perinatal depression between the first-child women and the second-child women in West China under the universal 2-child policy

## A STROBE compliant prospective cohort study

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### Abstract

**Background:** Universal 2-child policy was proposed in 2015 in China, but it was still uncertain whether having a second child would have any impacts on maternal health, especially mental health. So, the aim of this study was to compare the incidence of perinatal depression between the first-child women and the second-child women and to describe the patterns of perinatal depression from the first and third trimesters to 6 weeks postpartum.

**Methods:** A prospective cohort study was conducted in a university hospital, 969 first-child women and 492 second-child women registered in this hospital from Dec 2017 to Mar 2018 were involved in the study. The Mainland Chinese version of the Edinburgh Postnatal Depression Scale (EPDS) was applied to screen perinatal depressive symptoms, while socio-demographic and obstetric data were obtained by self-administered questionnaires. Multiple logistic regression analyses were used to compare the risk of depression between 2 groups, and repeated measures of analysis of variances (ANOVAs) were used to determine the EPDS scores of 2 groups across 3 stages.

**Results:** The incidence of perinatal depression was 21.78% to 24.87% and 18.29% to 22.15% in the first-child group and the second-child group, respectively. The second-child women were less likely to exhibit depressive symptoms than the first-child women in the first trimester (Adjusted OR=0.630, 95%CI=0.457–0.868,  $P=.005$ ), but no significant difference was found between the 2 groups in the third trimester and at postpartum period. During the whole perinatal period, no significant difference was found in EPDS scores of the first-child group among the three stages. However, the EPDS scores of the second-child group were higher in the first trimester than that at the postpartum period.

**Conclusion:** The risk of perinatal depression for the second-child women was no higher than for the first-child women, and the EPDS scores of the second-child women were decreasing during the perinatal period. So couples in West China are recommended to consider having a second child without much worry about its negative effects on mental health under the universal 2-child policy.

**Abbreviation:** EPDS = Edinburgh postnatal depression scale.

**Keywords:** China, perinatal depression, two-child policy

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The authors report no conflicts of interest.

All data generated or analyzed during this study are included in this published article [and its supplementary information files].

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## 1. Introduction

One-child policy proposed in 1980<sup>[1]</sup> was a special family planning policy in China. It restricted most of Chinese couples to have only one child and reduced the birth rate successfully. By 2010, China's total fertility rate had fallen to 1.18, which was far below the population replacement level.<sup>[2]</sup> Meanwhile, it has also some other benefits, including acceleration of gender equality, increasing of children's well-being, and falling of maternal mortality rate.<sup>[3]</sup> However, on the other side, the one-child policy has also brought many negative effects, such as accelerating population aging, labor shortages,<sup>[4]</sup> and the skewed sex ratio, which would threaten economic growth.<sup>[5]</sup> So 2-child policy was gradually introduced, couples at least one of the partners was an only-child were permitted to have 2 children from November 2013,<sup>[6]</sup> but by 2015, only 1.45 million (13.2%) of 11 million eligible couples applied for permission to have a second child.<sup>[3]</sup> In addition, the number of birth did not increase but decreased by 0.32 million in 2015 compared to the previous year.<sup>[2]</sup> The cost of childcare, age, work status, household income are main reasons preventing them from wanting a second child.<sup>[3,7]</sup> According to the low uptake, together with appeals from scholars and the media,<sup>[3]</sup> universal 2-child policy came into effect in China from January 1, 2016,<sup>[8]</sup> which means all Chinese couples are allowed

to have 2 children, and it marks the end of China's one-child policy which has lasted more than three decades.

After 35 years of 1-child policy, most of Chinese families had only 1 child, and they usually focused on their only-child. Now the new policy comes into effect, if they would have a second child, they will confront many problems in coping with the changed family model, such as more stress, more cost, more caretaking, less time in work, et al.<sup>[9]</sup> So many couples hesitate to have a second child, and it significantly limits the implementation of 2-child policy. It is really still uncertain whether the new policy has any negative impacts on maternal health, including physical and mental health.

Perinatal depression, as a main mental problem in both pregnant and postnatal women, has far-reaching consequences, affecting not only the women but also the birth outcomes,<sup>[10]</sup> the offspring,<sup>[11,12]</sup> the partners and family relationships.<sup>[13–15]</sup> It had been increasingly concerned by clinicians, nurses, community workers and scientists, and a great deal of researches about prenatal and postnatal depression had been done during the past several decades. However, to our knowledge, few large prospective studies about the second-child women's depression status, especially with comparison to the first-child women were concluded after the shift of the policy. Therefore, both the second-child women and the first-child women were involved in this study, their depressive symptoms were followed up from the first trimester of pregnancy to postpartum, and comparisons of perinatal depression were made between 2 groups, aims to explore the impacts of the policy on perinatal maternal mental health and the patterns of depressive symptoms during the whole perinatal period. The results will guide the couples to make decisions whether to have a second baby, help healthcare providers improve their service, and ensure the successful implementation of the 2-child policy in China.

## 2. Methods

### 2.1. Design and sample

This is a prospective cohort study, taking "having a second child" as the exposure which means the women who are going to have their first child be involved in the unexposed group (group 1), and the women going to have a second child be involved in the exposed group (group 2). Three times follow-up were taken from the first trimester to postpartum, and depressive symptoms assessment were done every time. In this study, the "first-child women" and "second-child women" meant those who were going to have their first or second child in the family, not their first or second gestation.

Women registered to give birth at a university hospital were recruited to the study from December 2017 to March 2018, and follow-up investigations were taken in the third trimester from April 2018 to July 2018 and at 6 weeks postpartum from August 2018 to December 2018.

This university hospital is the biggest women's and children's hospital in China, it is located in Chengdu, the fourth most populous city in China with a population of more than 14 million people covering an area of 14,335 km<sup>2</sup>. Many women from Sichuan and other provinces of West China come to this hospital to give birth and more than 10,000 babies were delivered in this hospital per year.

Convenience sampling was used in this study, the inclusion criteria were:

- (1)  $\leq 13$  weeks of gestation at enrolment;
- (2)  $\geq 18$  years old;
- (3) have sufficient proficiency in Chinese and can complete the written questionnaires by themselves.

The exclusion criteria were:

- (1) still birth or fetal deformities;
- (2) already had 2 or more children alive;
- (3) personal and family history of psychiatric problems.

### 2.2. Data collection

All women were invited to participate in the study on the voluntary basis, and their written informed consent for the purpose of research and publication was obtained. The questionnaires were completed by the women themselves in 30 minutes anonymously and confidentially. The first set of data was collected in the first trimester of pregnancy when they came to hospital to register for antenatal care visit, the second in the third trimester of pregnancy (after 28 weeks of gestation according to Chinese standard of pregnancy staging) during routine antenatal follow-up, and the final survey was carried out approximately 6 weeks after childbirth when they came back to have their routine postnatal checkup.

### 2.3. Measurement

The socio-demographic data were collected in the first time at enrolment in the study by a self-administered questionnaire, which included age, nationality, marital status, educational level, employment status, place of residence, religion, monthly individual income, and inmate. But living with partner and living with parents/ parents-in-law were collected every time as they were more changeable variables.

Obstetrical data were collected at different stages. Gestational weeks, planning of pregnancy were collected in the first trimester; gender expectations and complications during pregnancy were collected in the third trimester; delivery mode, weight of the newborn, the newborn's health status, emotional disturbance and postnatal caregiver were collected at the postpartum follow up.

The Mainland Chinese version of the Edinburgh Postnatal Depression Scale (EPDS) was used to screen perinatal depressive symptoms as it has already been validated in China in both prenatal<sup>[16,17]</sup> and postnatal women<sup>[13,18]</sup> with good reliability and validity. It is a 10-item self-rating scale, with each item scores 0 to 3, and the total scores range from 0 to 30. The recommended cut-off score is 9.5 with a 78.6% sensitivity and 83.4% specificity, and the area under curve (AUC) is 0.845.<sup>[16]</sup> The Cronbach's alpha in this study was 0.757 to 0.826, which suggested a good internal consistency.

### 2.4. Ethics consideration

Ethical approval that complied with the Declaration of Helsinki was obtained from the Ethics Committee of West China Second University Hospital, Sichuan University (No. 2019(002)).

### 2.5. Data analysis

The SPSS statistical software (version 22.0; SPSS Inc, Chicago, IL) was used for the statistical analysis. Descriptive analysis was carried out to analyze the socio-demographic data, the obstetrical data, depression incidence and the EPDS scores. As there were

significant differences between 2 groups' baseline variables, adjusted odds ratio with its 95% confidence interval were calculated to report the significant differences of risk in perinatal depression between 2 groups. Regarding "depression incidence" as dependent variable, "group" as independent variable, and the baseline variables had statistically significant differences as covariant, to establish regression model. Repeated measures of analysis of variances (ANOVAs) were used to determine the EPDS scores of 2 groups across three stages. The missing data were not filled up in this study. A *P* value of <.05 was considered statistically significant.

### 3. Results

#### 3.1. Socio-demographic and obstetric characteristics of the participants

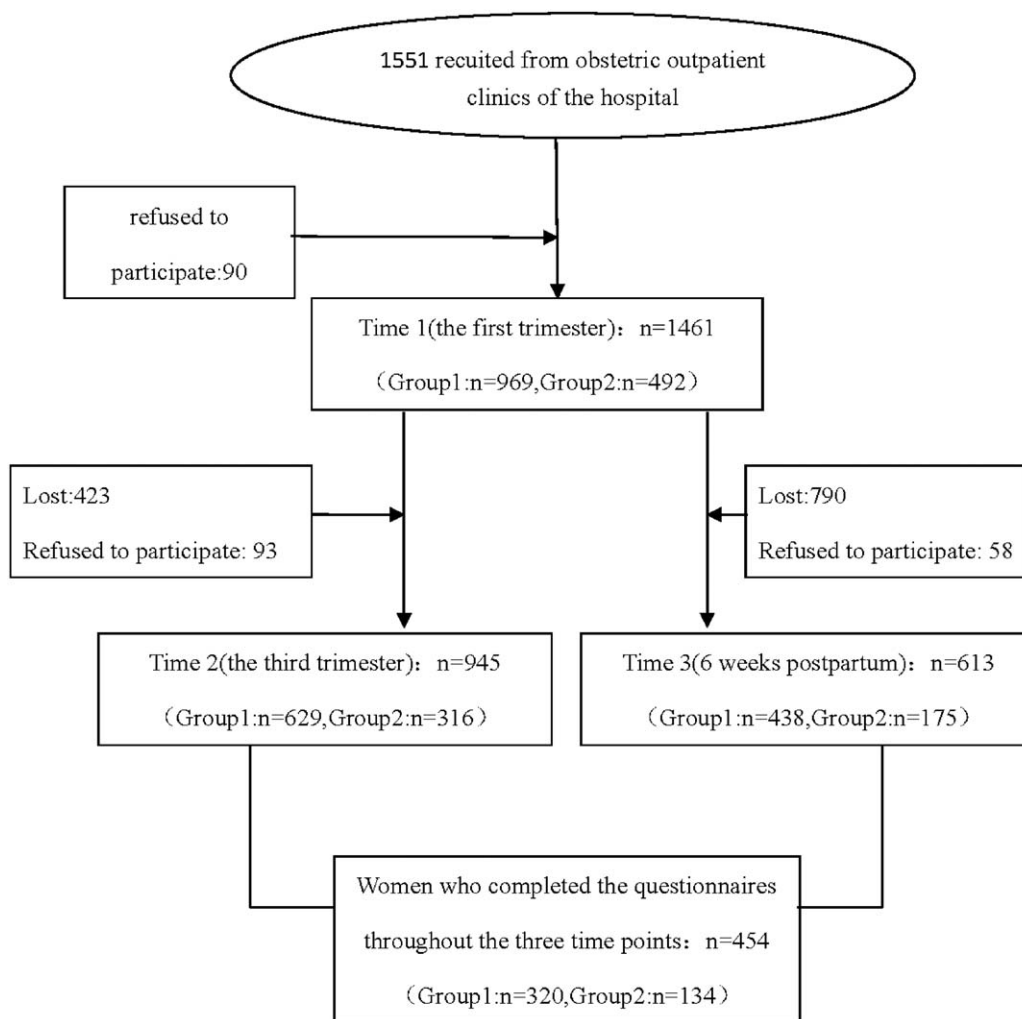
A total of 1551 women registered in a university hospital were invited to join the study (Fig. 1), of whom 1461 (969 first-child women and 492 second-child women) completed the questionnaires in the first trimester (response rate=94.20%), and 90 women refused to participate. The retention of women was 945 in the third trimester, including 629 first-child women and

316 second-child women. Although messages were sent to the participants by researchers to attempt to increase the number of returns, only 613 women completed the questionnaires at 6 weeks postpartum, including 438 first-child women and 175 second-child women. The number of women retained throughout the entire 3 times of survey was 454, and the response rate is similar to the previous prospective studies.<sup>[19,20]</sup> The primary reasons for withdrawal were that they did not come back to the hospital but went to community healthcare centers to have their postnatal checkup, however we did not have enough investigators to follow up in those places. A flow diagram was presented in Figure 1.

Detailed Socio-demographic characteristics of the participants were summarized in Table 1, and obstetric characteristics in Table 2.

#### 3.2. Comparisons of depressive symptoms between 2 groups

As shown in Table 3, the second-child women were less likely to exhibit depressive symptoms in the first trimester (AOR=0.630, 95%CI: 0.457–0.868, *P*=.005) after adjustment of all the



**Figure 1.** Flowchart for the implementation of the study. Group 1 = the first-child women group, Group 2 = the second-child women group, The arrows to the left or right ("←" or "→") in the figure meant the explanations to corresponding steps, and the down arrows ("↓") represented the progress of the steps.

**Table 1**  
**Socio-demographic characteristics of the participants at three stages of the study.**

Variables	Time 1 (n=1461)		<i>t/Z/χ<sup>2</sup>*</i>	<i>P</i>	Time 2 (n=945)		<i>t/Z/χ<sup>2</sup>*</i>	<i>P</i>	Time 3 (n=613)		<i>t/Z/χ<sup>2</sup>*</i>	<i>P</i> value
	Group 1 (n=969)	Group 2 (n=492)			Group 1 (n=629)	Group 2 (n=316)			Group 1 (n=438)	Group 2 (n=175)		
Age	30.14 ± 3.61	33.96 ± 3.69	-18.939	<.001	30.16 ± 3.55	33.92 ± 3.75	-15.091	<.001	30.27 ± 3.47	34.39 ± 3.55	-13.194	<.001
Educational level												
≤Secondly	90 (9.3)	78 (15.9)	13.823	<.001	56 (8.9)	45 (14.2)	6.277	.01	27 (6.2)	23 (13.1)	8.129	.004
>Secondly	879 (90.7)	414 (84.1)			573 (91.1)	271 (85.8)			411 (93.8)	152 (86.9)		
Marital status												
First-married	928 (95.8)	467 (94.9)	3.282	.19	602 (95.7)	305 (96.5)	1.585	.45	423 (96.6)	166 (94.9)	1.701	.43
Remarried	37 (3.8)	25 (5.1)			24 (3.8)	11 (3.5)			14 (3.2)	9 (5.1)		
Unmarried	4 (0.4)	0 (0.0)			3 (0.5)	0 (0)			1 (0.2)	0 (0)		
Employment												
Unemployed	111 (11.5)	83 (16.9)	8.309	.004	72 (11.4)	54 (17.1)	5.794	.02	50 (11.4)	27 (15.4)	1.833	.18
Employed	858 (88.5)	409 (83.1)			557 (88.6)	262 (82.9)			388 (88.6)	148 (84.6)		
Family income per person per month (RMB)												
<5000	156 (16.1)	76 (15.4)	15.884	.001	98 (15.6)	45 (14.3)	9.536	.02	66 (15.1)	19 (10.9)	6.024	.11
5000~7999	348 (35.9)	135 (27.4)			220 (35.0)	87 (27.5)			149 (34.0)	50 (28.6)		
8000~9999	220 (22.7)	114 (23.2)			146 (23.2)	73 (23.1)			94 (21.5)	51 (29.1)		
≥10000	245 (25.3)	167 (34.0)			165 (26.2)	111 (35.1)			129 (29.4)	55 (31.4)		
live with partner												
Yes	832 (85.9)	437 (88.8)	2.504	.11	539 (85.7)	280 (88.6)	1.548	.21	381 (87.0)	161 (92.0)	3.069	.08
No	137 (14.1)	55 (11.2)			90 (14.3)	36 (11.4)			57 (13.0)	14 (8.0)		
Live with parents /parents in-law												
Yes	557 (57.5)	385 (78.3)	61.461	<.001	399 (63.4)	247 (78.2)	21.101	<.001	382 (87.2)	145 (82.9)	1.968	.16
No	412 (42.5)	107 (21.7)			230 (36.6)	69 (21.8)			56 (12.8)	30 (17.1)		

Group 1 = the first-child women group, Group 2 = the second-child women group, Time 2 = the third trimester, Time 1 = the first trimester, Time 3 = 6 weeks postpartum.

\* Categorical variables were analyzed using the Pearson  $\chi^2$  test or rank sum test, continuous variable was analyzed by *t* test or rank sum test.

significantly different baseline variables shown in Table 1 and Table 2, but 2 groups were equally likely to report depressive symptoms in the third trimester and postpartum.

### 3.3. Patterns of perinatal depressive symptoms

Repeated measures ANOVAs were used to determine the EPDS scores across three stages. As shown in Table 4 and Figure 2, the mean EPDS scores of 2 groups were both changing during the perinatal period. It could be seen from Table 5 that there was no significant difference during the EPDS scores of the first-child group, while there was a significant difference during the EPDS scores of the second-child group ( $F=4.124$ ,  $P=.02$ ). And as shown in Table 6, the EPDS scores of the second-child group were significantly higher in the first trimester than at postpartum ( $P=.01$ ).

## 4. Discussion

To our knowledge, this is the first prospective cohort study making a comparison between the first-child women and the second-child women and exploring the patterns of perinatal depressive symptoms in China. We found that depressive symptoms were common in perinatal women. The second-child women were less likely to exhibit depressive symptoms than the first-child women in the first trimester, but no significant differences were found between them in the third trimester and at postpartum period. For the first-child women, no significant differences were found in EPDS scores during the perinatal period; however, the second-child women's EPDS scores were decreasing gradually from the first trimester to postpartum, lowest at postnatal period and highest in the first trimester.

Similar to other studies, we found that depressive symptoms were prevalent in both prenatal<sup>[21]</sup> and postpartum period,<sup>[22]</sup> but lower than some previous studies,<sup>[20,23–26]</sup> this may be attributed to the fact that most of the women registered in this hospital came from the relatively higher socioeconomic class and easy to get adequate perinatal social support.

Contrary to expectations, with all the baseline variables which had significant differences being adjusted, we did not find higher prevalence of perinatal depressive symptoms in the second-child women, but lower than that of the first-child women in the first trimester (AOR=0.630, 95%CI:0.457–0.868,  $P=.005$ ). Similar results were seen by Ayele in a cross-sectional study of 388 pregnant women in Ethiopia.<sup>[21]</sup> This may be attributed to the fact that the first-child women are lack of experience in coping with pregnancy related problems and more fear of pregnant complications. But Golbasi et al's<sup>[27]</sup> previous study about 258 pregnant women from 19 primary health care centers in Turkey revealed that the EPDS scores of multiparas were higher than that of primiparas, the possible explanations could be that the multiparas included not only the second-child women but also the third or more, and more children might bring more stress, but the multiparas in our study just means the second-child women, and the family support in China is very strong, the grandparents always help to take care of the children, so the parents do not have so much burden in child care. These findings indicate that having a second child will not increase the risk of the maternal perinatal depressive symptoms, the 2-child policy is a good family planning policy in China and should be promoted by Chinese people.

Consistent with Lau et al's<sup>[20]</sup> and Takehara et al's<sup>[28]</sup> studies, it was found that the EPDS scores of the second-child women were decreasing gradually from the first trimester to 6 weeks postpartum in our study. This is likely due to their greater confidence in parenting abilities owing to previous experience,

**Table 2**  
**Obstetrical characteristics of the participants at 3 stages of the study<sup>a</sup>.**

Time points	Variables	Group 1 (n=969)	Group 2 (n=492)	t/Z/χ <sup>2</sup> <sup>a</sup>	P value
Time 1	Gestational weeks	12.95±1.26	12.98±1.31	-0.415	.62
	Pregnancy plan				
	Planned	506 (52.2)	203 (41.3)	128.383	<.001
	Unplanned	112 (11.6)	158 (32.1)		
Time 2	Spontaneously	195 (20.1)	114 (23.2)		
	ART	156 (16.1)	17 (3.4)		
	Gestational weeks	34.40±1.99	34.33±2.05	0.498	.35
	Pregnancy plan				
	Planned	335 (53.3)	134 (42.4)	82.648	<.001
	Unplanned	70 (11.1)	98 (31.0)		
	Spontaneously	127 (20.2)	75 (23.7)		
	ART	97 (15.4)	9 (2.9)		
	Gender expectations of the women				
	Boy	26 (4.1)	20 (6.3)	17.299	<.001
	Girl	63 (10.0)	59 (18.7)		
	Doesn't matter	540 (85.9)	237 (75.0)		
Gender expectations of the partner					
Boy	38 (6.0)	35 (11.1)	12.367	.002	
Girl	81 (12.9)	55 (17.4)			
Doesn't matter	510 (81.1)	226 (71.5)			
Pregnancy complications					
Yes	186 (29.6)	119 (37.7)	6.294	.01	
No	443 (70.4)	197 (62.3)			
Time 3	Pregnancy plan				
	Planned	239 (54.6)	78 (44.6)	40.096	<.001
	Unplanned	50 (11.4)	47 (26.8)		
	Spontaneously	83 (18.9)	45 (25.7)		
	ART	66 (15.1)	5 (2.9)		
	Delivery mode				
	Vaginal delivery	205 (46.8)	52 (29.7)	14.998	<.001
	Cesarean delivery	233 (53.2)	123 (70.3)		
	Labor smoothly				
	Yes	234 (53.4)	127 (72.6)	18.935	<.001
	No	204 (46.6)	48 (27.4)		
	Postnatal complications				
	None	390 (89.1)	161 (92.0)	4.024	.13
	Infection or bleeding	33 (7.5)	13 (7.4)		
	Others	15 (3.4)	1 (0.6)		
	Postnatal emotional disturbance				
	Yes	54 (12.3)	8 (4.6)	8.277	.004
	No	384 (87.7)	167 (95.4)		
	Baby gender				
	Male(including male-male twins)	218 (49.8)	86 (49.1)	3.392	.18
	Female(including female-female twins)	207 (47.2)	88 (50.3)		
	Male-female twins	13 (3.0)	1 (0.6)		
	Attitude to baby gender				
	Satisfied	359 (82.0)	129 (73.7)	11.932	.003
	Doesn't matter	78 (17.8)	41 (23.4)		
	Dissatisfied	1 (0.2)	5 (2.9)		
	Healthy newborn				
	Yes	382 (87.2)	162 (92.6)	3.592	.06
	No	56 (12.8)	13 (7.4)		
	Neonatal birth weight(kg)	3.19±0.43	3.30±0.54	-2.708	.007
	Feeding patterns				
	Breast feeding	289 (66.0)	102 (58.3)	3.351	.19
	Mixed feeding	135 (30.8)	65 (37.1)		
	Formula feeding	14 (3.2)	8 (4.6)		
	Difficult to feed				
	Yes	80 (18.3)	18 (10.3)	5.927	.02
	No	358 (81.7)	157 (89.7)		
	Cared by parents in puerperium				
	Yes	244 (55.7)	96 (54.9)	0.037	.85
	No	194 (44.3)	79 (45.1)		
Cared by parents-in-law in puerperium					
Yes	188 (42.9)	62 (35.4)	2.908	.09	
No	250 (57.1)	113 (64.6)			
Cared by partner in puerperium					
Yes	211 (48.2)	82 (46.9)	0.087	.77	
No	227 (51.8)	93 (53.1)			
Cared by nanny in puerperium					
Yes	169 (38.6)	60 (34.3)	0.987	.32	
No	269 (61.4)	115 (65.7)			
Relationship with the care giver					
Not so good	5 (1.1)	0 (0.0)	5.367	.15	
general	46 (10.5)	11 (6.3)			
good	150 (34.3)	58 (33.1)			
perfect	237 (54.1)	106 (60.6)			

ART=assisted reproductive techniques, Group 1=the first-child women group, Group 2=the second-child women group, Time 2=the third trimester, Time 1=the first trimester, Time 3=6 weeks postpartum.

<sup>a</sup>Categorical variables were analyzed using the Pearson χ<sup>2</sup> test or rank sum test, continuous variable was analyzed by t test or rank sum test.



**Table 3**  
Comparisons on the risk of depression between 2 groups at 3 stages.

	n	EPDS scores $\geq$ 10 No.(%)	Adjusted* OR(95%CI)	P-value
Time 1				
Group 1	969	241 (24.87)	1.0 ref	
Group 2	492	109 (22.15)	0.630 (0.457–0.868)	.005
Time 2				
Group 1	629	137 (21.78)	1.0 ref	
Group 2	316	60 (18.99)	0.679 (0.446–1.032)	.07
Time 3				
Group 1	438	103 (23.52)	1.0 ref	
Group 2	175	32 (18.29)	0.912 (0.520,1.600)	.75

CI = confidence interval, EPDS = Edinburgh Postnatal Depression Scale, Group 1 = the first-child women group, Group 2 = the second-child women group, OR = odds ratio, Time 2 = the third trimester, Time 1 = the first trimester, Time 3 = 6 weeks postpartum.

\* Adjusted for socio-demographic and obstetric variables which were significantly different between 2 groups.

**Table 4**  
EPDS scores of 2 groups at 3 stages.

Group	n	Time 1	Time 2	Time 3
Group 1	320	7.47 ± 3.33	7.27 ± 3.36	7.44 ± 4.22
Group 2	134	7.37 ± 3.56	6.96 ± 3.78	6.46 ± 3.97

EPDS = Edinburgh Postnatal Depression Scale, Group1 = the first-child women group, Group2 = the second-child women group, Time 2 = the third trimester, Time1 = the first trimester, Time3 = 6 weeks postpartum.

including breastfeeding and child caring.<sup>[28]</sup> However, the EPDS scores in Takehara et al's<sup>[28]</sup> study of Japanese women was much lower than that of this study, the main cause may be the differences in national culture and people's characteristics, and Japanese have higher adversity quotient.

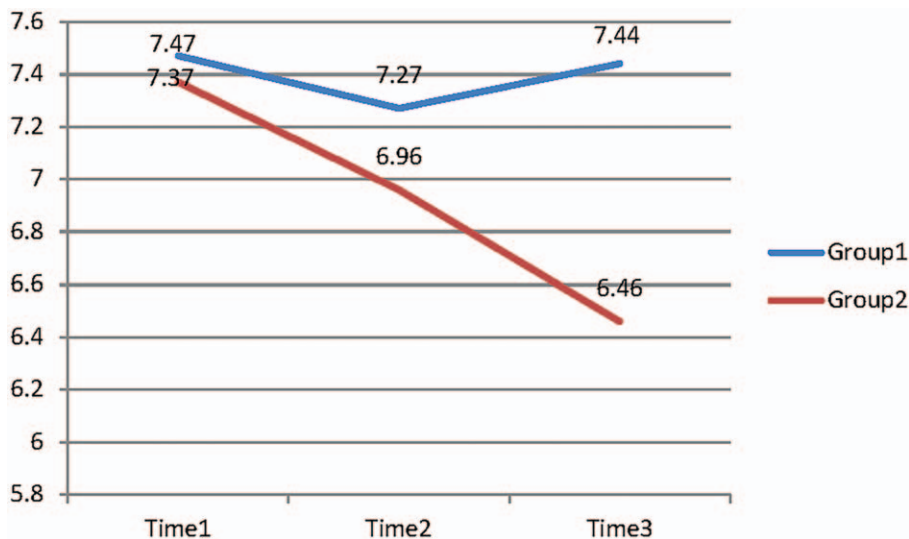
As compared to the second-child women, the first-child women did not show a significant change throughout the perinatal period. This finding was consistent with Liou et al's study of 197 women in Taiwan China.<sup>[29]</sup> As time advances, the stress derived from pregnancy gradually weakens, but new stress such as infant feeding and caring occurs, so the EPDS scores remain stable from antenatal to postpartum.

Since the EPDS scores of the second-child women showed a peak in the first trimester, it is very important for clinicians to

screen depressive symptoms early in pregnancy. But for the first-child women, it is necessary to screen perinatal depressive symptoms both early during pregnancy and postpartum. In addition, some non-pharmacological psychological training, such as self-management, mental relaxation techniques, and cognitive behavior programs should be suggested to antenatal intervention, so as to improve women's coping skills and reduce possibility of depressive symptoms.

### 5. Conclusion

The universal 2-child policy in China does not bring any significant influences in Chinese women's mental health. The second-child women are not more likely to experience perinatal



**Figure 2.** The line graph of EPDS scores in two groups. Time 1 = the first trimester, Time 2 = the third trimester, Time 3 = 6 weeks postpartum, Group 1 = the first-child women group, Group 2 = the second-child women group, EPDS = Edinburgh Postnatal Depression Scale, Group 1 — Group 2.

**Table 5****Repeated measures ANOVAs of EPDS scores at 3 stages in 2 groups.**

Group	Source	Type III Sum of Squares	df	Mean Square	F	P value
Group 1	Time	7.408	1.816	4.079	0.472	.61
	Error (time)	5003.925	579.304	8.638	–	–
Group 2	Time	55.716	2.000	27.858	4.124	.02
	Error (time)	1796.95	266.000	6.755	–	–

ANOVAs=analysis of variances, EPDS=Edinburgh Postnatal Depression Scale, Group 1=the first-child women group, Group 2=the second-child women group.

**Table 6****Pairwise comparisons of EPDS scores in the second-child group(LSD pairwise comparison after the event).**

Time	Mean Deviation	SE	P value
Time 1–Time 2	0.410	0.305	.18
Time 1–Time 3	0.910	0.347	.01
Time 2–Time 3	0.500	0.299	.09

EPDS=Edinburgh Postnatal Depression Scale, Time 2=the third trimester, Time 1=the first trimester, Time 3=6 weeks postpartum.

depressive symptoms. On the contrary, they are less likely to exhibit antenatal depressive symptoms in the first trimester. Meanwhile, their depressive symptoms will decrease constantly during the perinatal period. So couples can consider having a second-child without too much worry.

## 6. Limitations and recommendations

Although a prospective cohort study was conducted and some useful results about the impacts of the 2-child policy had been found, several limitations must be considered in interpreting our findings. First, our participant sample was drawn from only one university hospital, the women registered in this hospital could be identified as a representative group of higher class urban citizens but not representative enough in other populations in China, and multi-center studies should be done in the future. In addition, we just followed up to 6 weeks postpartum, the long term influences of the new policy was still unclear. So longer term longitudinal studies need to be carried out to explore the long-term influences of the 2-child policy.

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## Author contributions

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