

## Original Article

# Effect of extended nursing intervention on improvement of anxiety in puerperal patients

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Received April 25, 2018; Accepted May 28, 2018; Epub December 15, 2018; Published December 30, 2018

**Abstract:** Objective: To explore the effect of extended nursing intervention on the improvement of anxiety in puerperal patients. Methods: A retrospective analysis was conducted with a total of 746 mothers, who either had a caesarean or natural labor delivery. They were divided into either a conventional care group (325 cases) or an extended care group (421 cases) according to the nursing methods used after giving birth. The clinical data, nursing satisfaction, Self-Rating Depression Scale (SDS), and the Self-Rating Anxiety Scale (SAS) scores, as well as the number of cases with puerperal depression were compared between the two groups. Results: The degree of satisfaction with postnatal care in the extended care group was 95.01%, which showed a statistically significant difference from that of the conventional care group (70.46%) ( $P < 0.01$ ). Both scores of the extended care group began to steadily decrease in the third week ( $P < 0.05$ ), while only the SDS score decreased in the third week for the conventional care group ( $P < 0.05$ ) and increased again in the sixth week ( $P < 0.05$ ). The SDS and SAS scores in the extended care group were significantly superior to those in the conventional care group ( $P < 0.05$ ). There were only four cases of puerperal depression with an occurrence rate of 0.95% in the extended care group during the postnatal follow up period, which was significantly superior to that of the conventional care group (11.08%),  $P < 0.01$ . Conclusion: Extended nursing effectively improves the SDS and SAS scores of puerperal women, while also reducing the incidence of depression during puerperium, which is worthy of promotion in clinical practice.

**Keywords:** Extended nursing, puerperium, depression, anxiety

## Introduction

Puerperium is a critical period for women to recover their body functions after giving birth because in this period, women not only experience an extremely painful delivery, but also experience great psychological burden and physiological pressure due to the role of transitions [1]. Puerperium depression is a mental syndrome caused by various factors in puerperium [2]. Women with puerperium depression have extreme fluctuations in mood and present tremendous negative emotions, such as anxiety, depression and fear. The presence of such conditions in severe cases may even induce maternal suicide [3]. According to the statistics of Chouchana et al. [4], about 42% of women worldwide experienced different levels of puerperal anxiety after childbirth in 2016. Purwar et al. [5] also indicated that the incidence of anxiety in the puerperal period will only increase, rather than decrease. Anxiety during the puerperal period is not only harmful to the mothers them-

selves, but also poses a great threat to the family and infants.

According to the statistics of Mayer-Pickel et al. [6], infant developmental status in families with puerperal anxiety is significantly worse than that in a normal family, and the risk of mental illness in infants is 5-6 times higher than those in a normal family. Faced with the increasing severity of puerperal depression, various attempts have been made to reduce depression in women during puerperium. The latest research demonstrates that the selection of nursing methods effectively improves the conditions of women with puerperal anxiety, but it is still unclear which mode of care will achieve the best effect [7, 8]. Extended nursing requires the nursing staff to establish targeted nursing interventions, provide follow-up nursing for three months to six months after the mother discharges from the hospital, timely and regularly examine and guide the mothers after discharge, and strictly monitor the possibility of

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post-discharge recurrence [9]. All these aspects are of high significance for the improvement of the maternal prognosis. At present, there has been numerous relevant literature proving that extended nursing achieves great results on improving the postoperative mental status of patients with various types of diseases [10, 11]. However, few studies on puerperal anxiety have been reported.

Therefore, this study tested the hypothesis that application of extended nursing is of higher value for maternal anxiety during puerperium. An experimental analysis was carried out to find an effective nursing model in order to reduce the incidence of maternal puerperal anxiety as well as to improve the recovery of delivery women in puerperium in the clinic.

### Materials and methods

#### *General information*

This study retrospectively analyzed 746 cases of women who either gave birth via caesarean delivery or natural labor in The Second Hospital of Jilin University. Their ages ranged from 20 to 40 years with the average age of  $28.62 \pm 7.58$  years. According to the different nursing methods used after childbirth, the women were either divided into the conventional care group (maternal women using conventional nursing care) with 325 cases or the extended care group (maternal women using extended nursing care) with 421 cases.

#### *Inclusion and exclusion criteria*

**Inclusion criteria:** The selected participants were all mothers (aged between 20 to 40 years) who had undergone natural labor or caesarean delivery in the Second Hospital of Jilin University. Nursing care was provided in the Second Hospital of Jilin University after childbirth. All mothers completed the medical records. **Exclusion criteria:** mothers who were with important organ failure, drug allergy, upper respiratory and lower tract infection, cardiovascular disease, psychiatric illness, difficult labor; mid-way transfer or family history of genetic disease. All of the enrolled mothers signed an informed consent form.

#### *Method*

After childbirth, all mothers chose selective serotonin reuptake inhibitors (SSRIs) supplemented with diazepam to improve their mo-

od and sleep conditions. They were provided appropriate nursing interventions when treatment measures took effect. The conventional care group only used the conventional nursing mode. The contents include: Daily use of benzalkonium bromide solution to scrub twice, to keep the incision dry, use warm water to scrub the nipple and areola before and after nursing, and urge the patient to pay attention to diet, with high protein and liquid food. Furthermore, the extended care group added extended care to conventional nursing. The nursing items included care of the site where the mother gave birth: two scrubbings per day with a bromogermine solution, keeping the incision dry, instructing maternal side rest as well as taking strict measures to monitor the infection condition. Breast care: wiping the nipples and areola with lukewarm water before and after breastfeeding, guiding the mothers to perform simple stimulation and massage before breastfeeding, and instructing the mothers to pump the breastmilk by hand or use a breast pump in case of insufficient milk to avoid the occurrence of a blockage to the lactiferous ducts. Dietary care: the mothers mainly had a high protein diet with vitamin and mineral supplements. Mothers and their families were also reminded to eat more deep-sea fish, cherries, and bananas to help regulate emotional functions. Psychological care: assisting mothers to completion of conversion from wife to mother, guiding mothers to read books and articles related to puerperal healthcare and childcare, and communicating with mothers. Post-discharge care: establishing a maternal chat group, arranging nurses to answer maternal problems every day, promoting maternal communication, performing follow-up telephone surveys among all mothers once or twice a week, asking the mothers for periodic reviews or personal reviews once every three weeks, scoring the Self-Rating Depression Scale (SDS) and the Self-Rating Anxiety Scale (SAS) with reference to a study of Basnet et al. [12]. Once the outliers were observed, the counseling physician was informed to provide guidance and intervention for a period of three months.

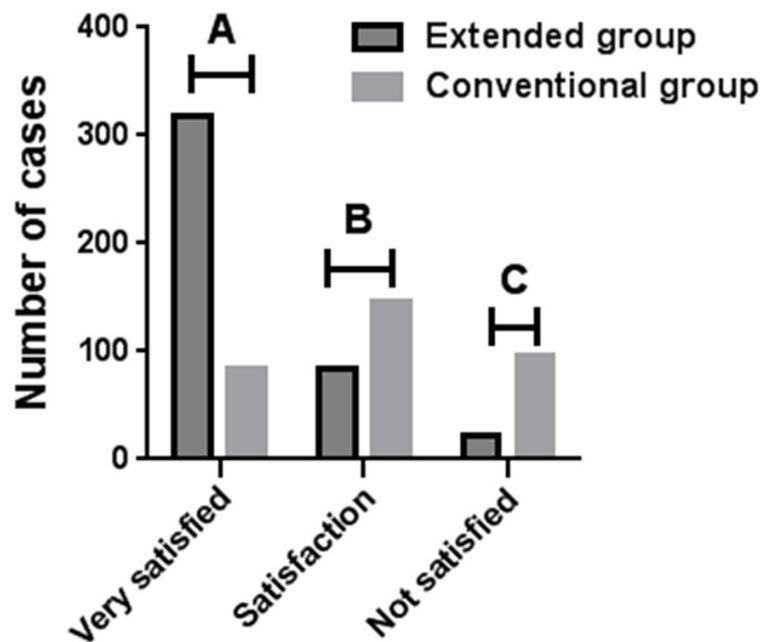
#### *Observation indicators*

Clinical data of the two groups of mothers were recorded. Nursing satisfaction: an anonymous assessment was performed using the percentage system to calculate the general satisfaction of mothers. Satisfaction was labeled as "excellent" if the satisfaction degree was over

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**Table 1.** Comparison of clinical data between the two groups of patients [n (%)]

	Extended group (n=421)	Conventional care group (n=325)	$\chi^2$ or t	P
Age (years)	28.16±8.54	29.07±7.54	1.49	0.14
Body weight (KG)	60.53±10.66	59.58±11.34	1.17	0.24
Platelet count ( $\times 10^9/L$ )	224.85±32.11	228.17±34.68	1.35	0.18
White blood cell count ( $\times 10^9/L$ )	26.89±8.66	28.14±9.05	1.92	0.06
Red blood cell count ( $\times 10^{12}/L$ )	10.88±4.67	11.53±5.74	1.71	0.09
Production methods			0.18	0.67
Caesarean section	154 (35.58)	114 (35.08)		
Obedience	267 (63.42)	211 (64.92)		
Place of residence			0.35	0.55
City	304 (72.21)	241 (74.15)		
Rural	117 (27.79)	84 (25.85)		



**Figure 1.** Comparison of maternal care satisfaction between the two groups. A represents a very satisfactory number of cases in the two groups of maternal women,  $P < 0.05$ , the extended care group was significantly higher than the conventional care group. B represents the general satisfaction of the two groups of maternal cases,  $P < 0.05$ , the conventional care group was significantly more than the extended group. C represents the number of unsatisfactory cases in the two groups of maternal women,  $P < 0.05$ , and the conventional care group was significantly more than the extended group.

90 points, “satisfactory” between 60 to 80 points and “dissatisfactory” below 60 points.

SDS and SAS scores (the assessing items and scoring rules of SDS and SAS are shown in [Figures S1](#) and [S2](#)) after childbirth and during the three months of prognostic care (five times in total, the lower the score, the better), and the number of cases with puerperal depression (SDS and SAS score  $\geq 72$  points) were assessed.

### Statistical methods

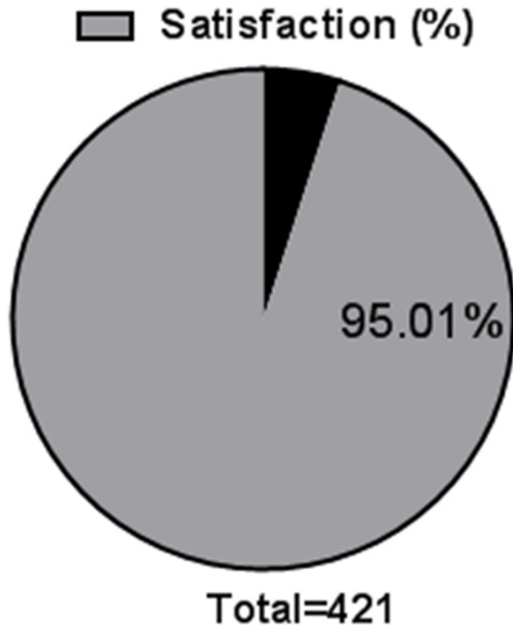
SPSS 22.0 (Shanghai Kaibei Information Technology Co., Ltd.) was used to process and analyze the data. The count data, such as maternal clinical information and nursing satisfaction, are expressed in the form of rates, and the Chi-square test was used for comparison between groups. Measurement data such as SDS and SAS scores are expressed in the form of mean  $\pm$  standard deviation, and t-tests were used for comparing the difference between two groups. Analysis of variance was used to compare multiple sets of data. Changes in SDS and SAS scores were plotted using Graph-Pad software. Statistical significance was set at  $P < 0.05$ .

### Results

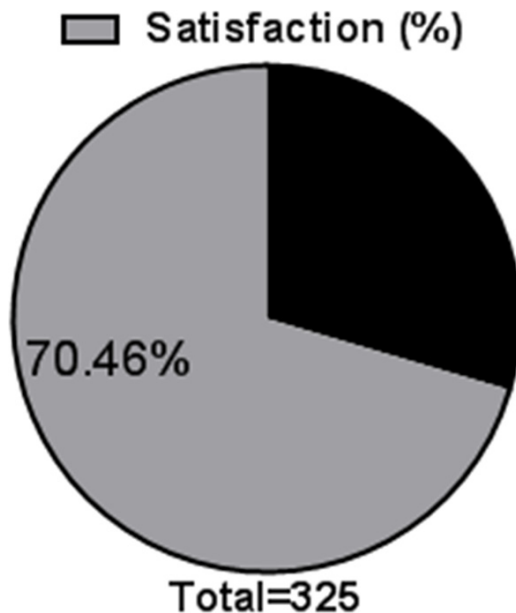
#### Comparison of clinical data

To ensure the reliability of the experiment, there was no significant difference in the clinical data ( $P > 0.05$ ) between the two groups of mothers including age, weight, platelets, white blood cells, red blood cells, survival patterns, as well as family residence, which proved that the moth-

ers in the two groups were comparable ([Table 1](#)).



**Figure 2.** Extended group care satisfaction. Extended group maternal care satisfaction is 95.01%.



**Figure 3.** General group care satisfaction. The satisfaction rate of maternal care in the conventional care group was 70.46%.

*Survey on nursing satisfaction*

The degree of satisfaction of mothers in the extended care group was 95.01%, which was statistically higher than that of the conventi-

onal care group (70.46%) ( $P < 0.01$ ). Among the patients in the extended care group, 75.30% (317 cases) were mostly satisfied, which was significantly higher than the 25.85% (84 cases) in the conventional care group ( $P < 0.01$ ). Only 4.99% (21 cases) of the mothers in the extended care group were unsatisfied, which was significantly lower than the 29.54% (96 cases) of the conventional care group ( $P < 0.01$ ) (Figures 1-3).

*SDS result*

There was no significant difference in the SDS scores after delivery between the extended group and the conventional care group ( $P > 0.05$ ). In the third week, the SDS score of the extended care group decreased more significantly ( $45.62 \pm 5.14$ ), which was lower than that of the conventional care group ( $48.77 \pm 8.65$ ),  $P < 0.05$ . At the sixth week, the SDS score of the extended group was significantly lower than that of the third week ( $P < 0.05$ ), while the SDS score of the conventional care group was significantly higher than that of the third week ( $P < 0.05$ ).

The SDS scores at the third week in the extended care group were significantly lower than that in the conventional care group ( $P < 0.01$ ). At the ninth and twelfth week, the SDS scores of the extended care group and the conventional care group both decreased significantly, but the SDS score of the extended care group was significantly lower than that of the conventional care group (all  $P < 0.01$ ). The trend graph of SDS scores demonstrate that the SDS scores of the extended group from childbirth to the final follow-up survey presented a stable and significant decrease, while the decline trend of the conventional care group from childbirth to the third week was inferior to that of the extended group, the SDS score increased and peaked at the sixth week and slowly declined again at the ninth week (Table 2 and Figure 4).

*SAS score result*

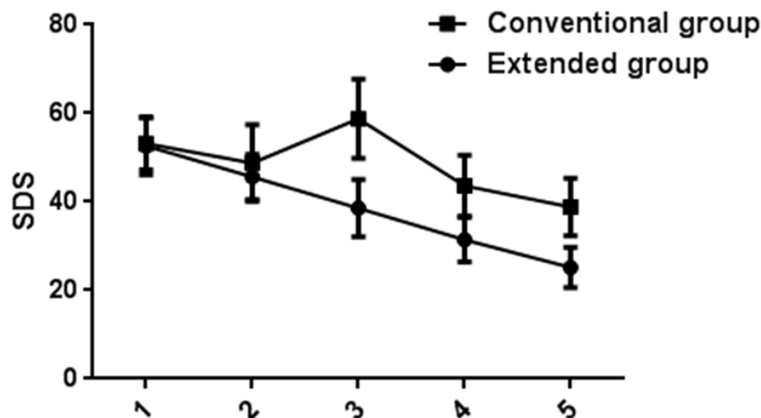
No significant difference was found in the SAS score after delivery between the extended group and the conventional care group ( $P > 0.05$ ). The SAS scores of extended and the conventional care groups decreased significantly at the third week ( $P < 0.05$ ), and the SAS scores of the extended group had a more significant decrease ( $49.37 \pm 8.46$ ), which was lower than

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**Table 2.** SDS score results of the two groups of patients

	Extended group (n=421)	Conventional care group (n=325)	t	P
After production			0.28	1.08
	52.64±6.51	53.14±5.89		
Week 3			6.19	<0.05
	45.62±5.14*	48.77±8.65*		
Week 6			35.82	<0.01
	38.57±6.43*#	58.74±8.94*#		
Week 9			27.97	<0.01
	31.44±5.04*#Δ	43.63±6.86*#Δ		
Week 12			33.79	<0.01
	25.17±4.52*#Δ∇	38.86±6.53*#Δ∇		

Note: \*, compare with after delivery data, P<0.05. #, compare with the third week, P<0.05. Δ, compare with the sixth week, P<0.05. ∇, compare with the ninth week, P<0.05.



**Figure 4.** Trend of SDS scores in extended groups. The SDS scores of the extended group of mothers showed a stable and declining trend from the post-production to the final follow-up survey.

that of the conventional care group (55.67±7.48), P<0.05. At the sixth week, the SAS scores of the extended group significantly decreased (P<0.05), while there was no significant difference between the third and sixth week in conventional group (P>0.05). The SAS score at the 6th week was significantly lower in the extended group than in the conventional group (P<0.01). At the ninth and twelfth week, the SAS scores of the extended care group and the control group decreased significantly, but the SAS score of the extended care group was significantly lower than that of the conventional care group (P<0.01). The trend of SAS scores showed that the SAS scores of the two groups showed a steady downward trend after childbirth, but the extended care group showed a

more significant downward trend and the difference was even greater (Table 3 and Figure 5).

### Incidence of puerperium depression

From childbirth to the end of follow-up, only four mothers developed puerperal depression in the extended care group with an incidence of disease of 0.95%, while in the conventional care group, 36 cases were observed with puerperal depression with an incidence of 11.08%. Comparing the incidence of puerperium depression in the two groups, the extended care group was significantly lower than that in the conventional care group (P<0.01) (Figures 6 and 7).

### Discussion

Carrying on the family line is extremely important for every family. Childbirth poses harm to mothers, and it is also a major challenge for women experience a transformation of their roles [13]. Under dual physiological and psychological pressures, the emotions of women at this time are

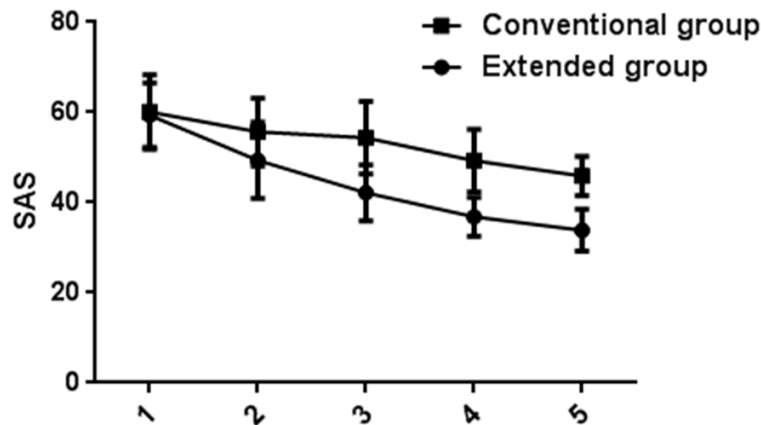
extremely fragile. During this period, if emotions cannot be effectively regulated, the stress response will directly harm them, psychologically and physiologically, and threaten their families [14]. According to the statistics of Fenwick et al. [15], it usually takes about five weeks for women to completely recover mentally and physically after delivery, which is called the puerperium period. Depression occurs mostly in the fourth week after childbirth [16], when women are generally discharged, and the physical functions have been restored to good levels. Most couples become fathers and mothers for the first time and give insufficient attention to psychological conditions, which leads to a high incidence of depression in women during puerperium [17]. This causes disor-

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**Table 3.** SAS score results of the two groups of patients

	Extended group (n=421)	Conventional care group (n=325)	t	P
After production			0.22	1.24
	59.37±7.16	60.07±8.26		
Week 3			10.60	<0.01
	49.37±8.46*	55.67±7.48*		
Week 6			23.24	<0.01
	42.17±6.21*.#	54.37±8.07*		
Week 9			30.02	<0.01
	36.84±4.35*.#,Δ	49.31±6.94*.#,Δ		
Week 12			36.22	<0.01
	33.86±4.65*.#,Δ,▽	45.93±4.33*.#,Δ,▽		

Note: \*, compare with after delivery data, P<0.05. #, compare with the third week, P<0.05. Δ, compare with the sixth week, P<0.05. ▽, compare with the ninth week, P<0.05.



**Figure 5.** Trend of SDS scores in the conventional care group. In the conventional care group, maternal women gradually fell during the third week, peaked at the sixth week, and then gradually decreased again at the ninth week.

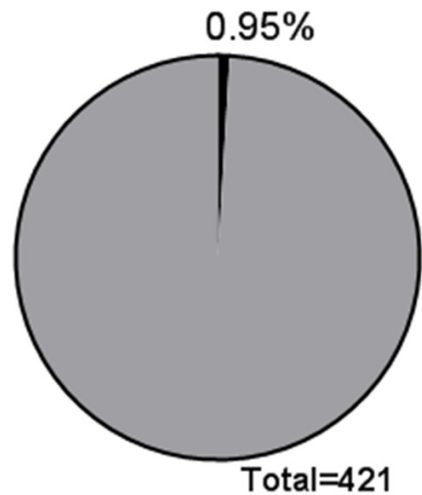
ders of the female endocrine system, affects maternal contractions, and leads to postpartum hemorrhage [18]. The false function of the circulation system may cause abnormal breast milk secretion, which directly affects the health of the newborn [19]. At present, faced with the increasing occurrence of puerperium depression, there is an urgent need for an effective measure to reduce the incidence of morbidity in the clinic. The most effective method is the selection of nursing mode. There is still a debate over the choice of nursing care for puerperal women in China, but this study presumed that extended nursing had a very high application value for puerperal women, and the experimental results also prove our point of view.

The results of this experiment demonstrated that the mothers who received extended care had higher levels of satisfaction than those in the conventional care group, and the SDS score, SAS score, and puerperal depression in the extended care group were significantly superior to those of the conventional care group. This suggests that extended care is applicable and feasible to females within puerperium. The research of Becker et al. [20] proved that a majority of women experiencing depression during puerperium lacked effective communication with their husbands. Therefore, it was supposed that the key factor inducing the difference between the two groups lay in the role of communication. The maternal communication group promotes mutual communication among women and the nurses' guidance solves the difficulties they face, which not only gives answers to problems encountered, but also raises the emotions of these mothers through the process of communication. According to the statistical report of Chan et al. [21], maintenance of an optimistic and confident

attitude helps the treatment of various diseases.

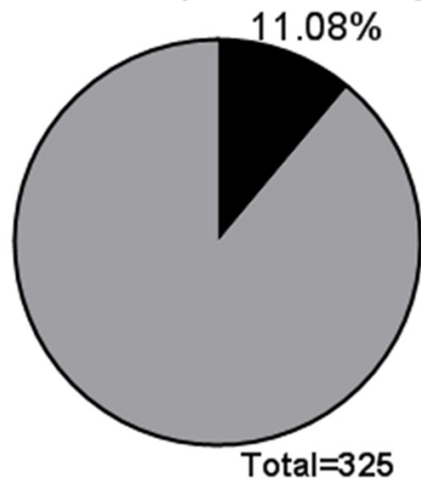
Extension nursing requires the medical staff to provide long-term and regular psychological counseling and communication education during hospitalization and discharge [22] in order to maintain an optimistic attitude, improve self-confidence, and eliminate negative emotions of the mothers, which naturally and effectively reduces the occurrence of depression in puerperium. There was no significant difference in the first SDS and SAS scores of the two groups of women after childbirth (P>0.05) and in the subsequent process, the two scores in the extended care group showed a steady downward trend. In contrast, the SDS score in the conven-

■ Incidence of depression during puerperium



**Figure 6.** Trends in SAS scores in extended groups. In the extended group, the SAS score showed a significant decrease from the post-production to the final follow-up.

■ Incidence of depression during puerperium



**Figure 7.** Trends in SAS scores in the conventional care group. From post-production to the final follow-up survey, the SAS of the routine group showed a gradual downward trend, but remained basically the same from the third week to the sixth week, and the overall downward trend was not significant.

tional care group increased in the sixth week ( $P < 0.05$ ) and at the same time, the SAS score had no significant difference compared with that in the third week ( $P > 0.05$ ). The reason being that the third to sixth weeks have a higher incidence of depression during puerperium [23]. Conventional care is usually provided only about one week after the woman is discharged from the hospital, and fails to provide effective

psychological counseling for the mother, which causes an increase in the scores or rare changes during this period. The extended group effectively avoided the psychological barriers during the high incidence period of puerperal depression and induced the steady decline of SDS and SAS scores through routine psychological counseling and rigorous psychological monitoring, which demonstrates that extended nursing is feasible. This is consistent with the results of a study by Vasudev et al. [24] that suggested that extended care may reduce the postoperative SDS and SAS scores in elderly patients, supporting the experimental point of view. Through targeted psychological counseling, enthusiastic responses to possible maternal problems, enhanced communication of mothers, healthcare professionals, and family members, long-term and regular follow-up surveys, and strict psychological status monitoring, extended care has effectively improved depression and anxiety in the puerperium period and reduced the possibility of puerperal depression. This can be used as an effective nursing model in clinics to cope with puerperal women.

Owing to the limited experimental conditions, there are still deficiencies in this study, such as the relatively simple

participant population and the great limitation of ages, there may be differences in elderly mothers. We will conduct longer-term follow-up surveys on this research subject and continue to improve and perfect it in future experiments to achieve the best experimental results.

In summary, extended nursing effectively enables maternal SDS and SAS scores to impro-

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ve and reduce the incidence of depression during puerperium, which is worthy of promotion in clinical practice.

### Disclosure of conflict of interest

None.

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### Zung Self-Rating Depression Scale (SDS)

For each item below, please place a check mark (✓) in the column which best describes how often you felt or behaved this way during the past several days

Place check mark (✓) in correct column.	A little of the time	Some of the time	Good part of the time	Most of the time
1. I feel down-hearted and blue.				
2. Morning is when I feel the best.				
3. I have crying spells or feel like it.				
4. I have trouble sleeping at night.				
5. I eat as much as I used to.				
6. I still enjoy sex.				
7. I notice that I am losing weight.				
8. I have trouble with constipation.				
9. My heart beats faster than usual.				
10. I get tired for no reason.				
11. My mind is as clear as it used to be.				
12. I find it easy to do the things I used to.				
13. I am restless and can't keep still.				
14. I feel hopeful about the future.				
15. I am more irritable than usual.				
16. I find it easy to make decisions.				
17. I feel that I am useful and needed.				
18. My life is pretty full.				
19. I feel that others would be better off if I were dead.				
20. I still enjoy the things I used to do.				

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Figure S1. Self-rating depression scale, SDS.

Extended nursing intervention improve anxiety in puerperal patients

**Zung Self-Rating Anxiety Scale (SAS)**

For each item below, please place a check mark (✓) in the column which best describes how often you felt or behaved this way during the past several days. Bring the completed form with you to the office for scoring and assessment during your office visit.

Place check mark (✓) in correct column.	A little of the time	Some of the time	Good part of the time	Most of the time
1 I feel more nervous and anxious than usual.				
2 I feel afraid for no reason at all.				
3 I get upset easily or feel panicky.				
4 I feel like I'm falling apart and going to pieces.				
5 I feel that everything is all right and nothing bad will happen.				
6 My arms and legs shake and tremble.				
7 I am bothered by headaches neck and back pain.				
8 I feel weak and get tired easily.				
9 I feel calm and can sit still easily.				
10 I can feel my heart beating fast.				
11 I am bothered by dizzy spells.				
12 I have fainting spells or feel like it.				
13 I can breathe in and out easily.				
14 I get feelings of numbness and tingling in my fingers & toes.				
15 I am bothered by stomach aches or indigestion.				
16 I have to empty my bladder often.				
17 My hands are usually dry and warm.				
18 My face gets hot and blushes.				
19 I fall asleep easily and get a good night's rest.				
20 I have nightmares.				

Source: William W.K. Zung. A rating instrument for anxiety disorders. Psychosomatics. 1971

Figure S2. Self-rating anxiety scale, SAS.