IJBB
International Journal of Biotechnology and Biomedicine
Vol. 1 No3; October 2024 https://doi.org/10.31674/ijbb.2024.v01i03.001

The Effect of Different Numbers of Deliveries on Postpartum Post-Traumatic Stress Disorder in Women with High-Risk Pregnancies

Juan Zhu[1], *Faridah Mohd Said[1], Chun Hoe Tan[2]

[1]Faculty of Nursing, Lincoln University College, Malaysia
[2]Department of Biotechnology, Faculty of Applied Science, Lincoln University College Malaysia

First Author's Email: zhu.juan@lincoln.edu.my
Corresponding Author's Email: faridah.msaid@lincoln.edu.my

Article received on 8th August 2024
Revision received on 19th September 2024.
Accepted on 23rd September 2024.

ABSTRACT

Objective: To analyze the effects of different numbers of deliveries on postpartum post-traumatic stress disorder in high-risk pregnancies. **Methods:** High-risk pregnant women giving birth in one of the three tertiary hospitals in Jiangsu Province were selected from April 2024 to July 2024 by convenience sampling using a cross-sectional survey method. A general information questionnaire and post-traumatic stress disorder scale were used to investigate and analyze the effects of different numbers of deliveries on postpartum PTSD high-risk pregnancies. **Results:** The incidence of postpartum PTSD in high-risk pregnancies was 15.83%, and there was no correlation between the number of deliveries and postpartum stress disorder. The rate of postpartum PTSD was higher in multipara mothers than in prim gravid women, but the difference was not significant($P>0.05$). **Conclusion**: There was no correlation between the number of deliveries and postpartum PTSD in high-risk pregnancies. As the number of deliveries increases, the risk of pregnancy increases. Hence, it is necessary to improve the management of pregnancy and labor, to improve the management of pregnancy and labor, to reduce complications, and to improve the outcome of pregnancy. It is also necessary to improve maternal mental health education, proactive counselling and intervention.

Keywords: Numbers of Deliveries; PTSD; High-Risk Pregnancies; Effect

1. INTRODUCTION

A high-risk pregnancy is a pregnancy that may endanger the mother and fetus due to comorbidities and complications during pregnancy (Majella et al., 2019). A Norwegian prospective study showed a significant association between high-risk pregnancy and obstetric complications (Magnus et al., 2019). Jim Parker et al. (Parker et al., 2024)also found that women with high-risk pregnancies had a significantly increased relative risk of pregnancy complications. With the adjustment of China's fertility policy, the incidence of high-risk pregnancies has increased (Zhimin et al., 2023). Under the influence of the new fertility policy, the proportion of high-risk pregnant women is continuing to grow, including in the Dong Cheng District of Beijing, which increased from 66.42% in 2017 to 82.20% in 2021 (Jia-li et al., 2022). Compared with 48.8% in 2016 (Center, 2018), the detection rate of high-risk factors in pregnant women in Shanghai in 2021 reached 51.71% (Hongmei et al., 2023).

And the incidence of high-risk pregnancies in Xinjiang increased even more dramatically, from 29.4% (Center, 2018)in 2016 to 62.05% (Dan et al., 2022) in 2021. Several research investigations (Dikmen-Yildiz et al., 2018; Fengna et al., 2024) have shown that mothers with high-risk pregnancies are more likely to develop postnatal PTSD. A high-risk pregnancy can be a significant source of stress for women, starting with the diagnosis of the condition, prenatal examinations, birth, and even the postoperative period. This can lead to elevated levels of mental stress and unpleasant emotions (Isaacs et al., 2020; Rodrigues et al., 2016). Several studies validate that pregnant women with a family history of gestational hypertension have a higher likelihood of developing depression, anxiety, and post-traumatic stress disorder (Roberts et al., 2019). Shaw et al. conducted a study including 15,986 high-risk pregnancies and found that women who experienced gestational diabetes and pre-eclampsia during pregnancy had a notably higher likelihood of acquiring post-traumatic stress disorder (PTSD) (Shaw et al., 2017). Maternal PTSD is prone to cause tension in the father's relationship(Delicate et al., 2018; Garthus-Niegel et al., 2018), which is also detrimental to the parent-child relationship and the child's development (Cook et al., 2018; Dozio et al., 2020; Stuijfzand et al., 2020; Van Sieleghem et al., 2022). With the liberalization of China's two- and three-child policy, the age at which women give birth increases, and the number of deliveries increases, increasing the chance of postpartum PTSD in women with high-risk pregnancies. The present study focused on assessing the status of postpartum PTSD in women with high-risk pregnancies by using the PCL-C scale and exploring the effect of the number of deliveries on maternal postpartum psychological status.

2. RESEARCH SUBJECTS AND METHODS

2.1 Research subjects: High-risk pregnant women who gave birth in one of the three tertiary hospitals in Jiangsu Province from April 2024 to July 2024 were selected as research subjects. Inclusion criteria: meet the diagnostic criteria of high-risk pregnancy; maternal voluntary participation in this research study; have full cognitive and behavioral ability. Exclusion criteria: understanding and communication disorders, inability to cooperate with the completion of the questionnaire; diagnosed psychiatric patients or patients with postpartum post-traumatic stress disorder; family history of psychiatric disorders; serious stressful events occurring after the delivery, such as domestic violence, death of a family member or a close relative.

2.2 Survey instrument: The researchers designed the general information questionnaire based on the literature review. It included age, postpartum time, education, marital status, monthly family income, whether it was a first birth, mode of delivery, presence or absence of epidural analgesia, satisfaction with delivery, quality of postpartum sleep, adverse maternal history, chronic diseases, pregnancy comorbidities, weekly age of newborn at birth, feeding mode, presence or absence of early mother-infant skin-to-skin contact, and presence or absence of newborn admission to the care unit.

Post-traumatic stress checklist-civilian version (PCL-C) (Xiao yun et al., 2007): This study used this scale to investigate the symptoms of PTSD in the postpartum period in women with high-risk pregnancies. The PCL-C consists of 17 items and 3 symptom clusters (repeated experience, avoidance numbness, and increased alertness). The PCL-C was scored on a 5-point Likert scale, with 1 being "not at all" and 5 being "extremely severe". The total score ranged from 17 to 85, and the higher the score, the higher the likelihood of PTSD, with a PCL-C score of ≥38 as the cut-off criterion for positive PTSD symptoms. In this study, the internal consistency reliability of the scale was 0.976 with Cronbach's α coefficient.

2.3 Data collection method: The researcher sent an online questionnaire to the research subjects on site, and before the questionnaire was filled out, the researcher explained the purpose of the study and stated that the survey was anonymous to obtain the consent of the research subjects. During the survey process, if the research subjects had any questions, the researcher answered them promptly. The questionnaire took 10~15 minutes to complete and was verified by the researcher after completion. The questionnaires were recovered and entered by two persons according to the unified standard to ensure the accuracy of the data. Two hundred forty valid questionnaires were recovered, with an effective recovery rate of 95.6%.

2.4 Statistical methods: SPSS 27.0 software was used for data processing. Measurement data were normally distributed and described as mean±standard deviation (x±s); independent samples t-test and analysis of variance were used; count data were expressed as the number of cases and percentage (%); Pearson's correlation analysis analyzed the correlation between the number of deliveries and postpartum post-traumatic stress disorder, and the difference was regarded as statistically significant at $P<0.05$.

3. RESULTS

3.1 Current status of postpartum PTSD in mothers with high-risk pregnancies: The incidence of postpartum stress disorder in mothers with high-risk pregnancies was 15.83% (38/240), and the incidence of postpartum PTSD in primiparous women with high-risk pregnancies was lower than that of multipara mothers. The mean of the total scores of postpartum PTSD in primiparous women with high-risk pregnancies was lower than that of multipara mothers (1.55±0.63), as shown in Table 1. The scores of all three dimensions of postpartum PTSD (Repeated experience, Avoidance numbness, Increased alertness) were lower in primigravid women than in multipara women. However, the difference between the groups was insignificant ($P>0.05$). See Table 2.

Table 1 Comparison of the incidence of post-traumatic stress disorder between two different groups of women （%）

Group	No	PTSD (N=38)	Non-PTSD (N=202)	χ^2	P
				0.40	0.526
Primipara	125	18（14）	107（86）		
Multipara	115	20（17）	95（83）		

IJBB
International Journal of Biotechnology and Biomedicine
Vol. 1 No3; October 2024 https://doi.org/10.31674/ijbb.2024.v01i03.001

Table 2 Postpartum PTSD scores of two different groups of women (x±s, n=240)

Group	No	PCL-C	Repeated experience	Avoidance numbness	Increased alertness
Primipara	125	1.55±0.63	1.81±0.77	1.51±0.63	1.64±0.76
Multipara	115	1.70±0.89	2.02±1.22	1.63±0.85	1.82±0.91
t		-1.516	-1.611	-1.241	-1.536
P		0.115	0.216	0.108	0.131

3.2General information of women with high-risk pregnancies: 240 women with high-risk pregnancies were divided into 2 groups, 125 primigravid women and 115 multipara women, and there was statistical significance in age, education level, mode of delivery, and weekly age at birth of newborns in the two groups (P<0.05). Marital status, monthly income level, postnatal time, mode of delivery, presence of epidural anaesthesia, satisfaction with delivery, postnatal sleep quality, chronic diseases, pregnancy comorbidities, feeding mode, presence of early mother-infant skin-to-skin contact, and whether or not the neonate was admitted to the care unit were not statistically significant (P > 0.05). See Table 3.

Table 3 Comparison of clinical baseline data between primipara and multipara (%)

Group	No	primipara (N=125)	multipara (N=115)	χ^2	P
Age (Years)				27.65	<0.001
<25	17	12（5.0）	5（2.08）		
25~35	151	94（39.17）	57（23.75）		
>35	72	19（7.9）	53（22.10）		
Education				16.142	<0.001
Junior high school and below	47	16（6.70）	31（12.9）		
High school	53	21（13.30）	32（8.8）		

Bachelor's Degree	126	80（33.3）	46（19.20）		
Master and above	14	8（3.3）	6（2.5）		
Marriage status				6.814	0.078
First Marriage	221	117（48.8）	104（43.3）		
Remarried	11	2（0.8）	9（3.8）		
Divorced	4	3（0.3）	1（0.4）		
Other	4	3（0.3）	1（0.4）		
Monthly household income (RMB)				0.142	0.706
<6000	125	53（22.1）	46（19.2）		
≥6000	115	72（30）	69（28.7）		
Postpartum time (month)				1.089	0.58
1~3	119	58（24.2）	61（25.4）		
4~6	21	12（5）	9（3.8）		
7-12	100	55（22.9）	45（18.8）		
Mode of delivery				8.9	0.031
Natural Vaginal Delivery	105	43（17.9）	62（25.8）		
Planned Caesarean Section	89	53（22.1）	36（15.0）		
Negative Caesarean Section	19	6(2.5)	13（5.4）		
Emergency cesarean section	27	13(5.4)	14（5.8）		
Epidural Analgesia				0.426	0.514
Yes	143	72(30)	71（29.6）		
None	97	53(22.1)	44（18.3）		
Childbirth satisfaction				1.092	0.579

Satisfactory	197	103(42.9)	94（39.2）		
Dissatisfied	43	22(9.2)	21（8.7）		
Postpartum sleep quality				0.605	0.730
Good	98	54(22.5)	44(18.3)		
Fair	122	61(25.4)	61(25.4)		
Poor	20	10(4.2)	10(4.2)		
History of adverse pregnancy				1.997	0.158
Yes	63	28(11.7)	35(14.6)		
None	177	97(40.4)	80(33.3)		
Chronic disease				0.462	0.496
Yes	33	19(7.9)	14(5.8)		
None	207	106(44.2)	101(42.1)		
Complication of pregnancy				1.326	0.25
Yes	41	18（7.5）	23(9.6)		
None	199	107（44.6）	92(38.3)		
Gestational age at birth (weeks)				16.142	0.002
<37	22	9（3.80）	13（5.40）		
37~42	194	103（42.9）	91（37.90）		
>42	24	135.40）	11（4.60）		
Feeding pattern				4.176	0.124
Breast-feeding	175	98（40.8）	77（32.1）		
Artificial feeding	22	10（4.2）	12（5）		
Mixed feeding	43	17（7.1）	26（10.8）		
Early mother-infant				1.254	0.263

skin contact					
Yes	183	99（41.3）	84（35.0）		
None	57	26（10.8）	31（12.9）		
Infants are admitted to the NICU				0.417	0.518
Yes	48	27（11.3）	21（8.8）		
None	192	98（40.8）	94（39.2）		

3.3 Correlation analysis of postpartum PTSD in high-risk pregnancies Pearson's correlation analysis showed that the number of deliveries (r=0.099, p=0.126) suggests that the number of deliveries has no correlation with postpartum PTSD in high-risk pregnancies (p >0.05). With the increase in the number of deliveries, there is no increase in the risk of postpartum PTSD. See Table 4

Table 4 Relationship between different numbers of deliveries and postpartum PTSD (Pearson)

Factor	**PCL-C score**	**Repeated experience**	**Avoidance numbness**	**Increased alertness**	
Number of births	0.099	0.104	0.081	0.104	r
	0.126	0.108	0.210	0.108	P

4. DISCUSSION

4.1 Postpartum PTSD in women with high-risk pregnancies: The results of this study showed that 38 of 240 women with high-risk pregnancies met all the diagnostic criteria for PTSD in the DSM-5, with a positive detection rate of 15.83%. The mean total postpartum PTSD score for primiparous women with high-risk pregnancies was lower (1.55±0.63) than that for multipara women (1.70±0.89). A study by Russian researcher Yakupova (Yakupova et al., 2022) on 611 Postpartum PTSD and birth experience in Russian-speaking women aged between 18~45 years showed that 15% had postpartum PTSD. Both studies are consistent. It has been shown that as many as one-third of women consider childbirth to be traumatic to varying degrees (Schobinger et al., 2020) and are at risk of developing postpartum post-traumatic stress disorder (PTSD) (de Graaff et al., 2018). The results of this study showed that the incidence of postpartum PTSD was 24.2% and 25.4% for primiparous and multipara mothers in the first 1~3 months postpartum, respectively, higher than that of 4~6 months postpartum and 7~12 months postpartum. Therefore, clinical workers should pay more attention to postpartum women, especially in the postpartum period of 3 months, and provide practical psychological assessment, psychological counselling through various health promotion methods, and good social support and assistance.

4.2 General information about mothers with high-risk pregnancies: The results of this study showed that the differences between the age at delivery, the level of maternal education and culture, the mode of delivery, and the weekly age of the newborn at birth were statistically significant (P<0.05).

Age: The age of multipara mothers was higher than that of primigravid women, and the proportion of women of advanced age was higher. The age of primigravid women ranged from 23 ~ 41 (29.35±4.28) years old, and the age of multipara mothers ranged from 23~42 (31.55±5.07) years old, and the difference was statistically significant (P<0.05). Among the multipara mothers, there were 53 cases, accounting for 22.15%. Among the primigravid women, there were 19 cases, accounting for 7.9% of the total, with an age greater than 35 years. According to the National Bureau of Statistics of China, in the past decade, the fertility rate of women over 35 years of age in China has shown an increasing trend, with the fertility rate of women aged 35~44 years rising from 10.42% in 2003 to 15.96% in 2011, and to 23.97% in 2015. It may be related to the following reasons: with China's two-child and three-child policies opening, some women have two or three children at an advanced age; with the improvement of women's education level, maternal childbearing is delayed. The survey shows (Ling et al., 2017)that the second-child fertility rate of 35~44-year-olds rose from 9.35 ‰ in 2011 to 12.3‰ in 2013 and to 13.41 ‰ in 2015, and the second-child fertility rate of this age group was higher than the first-child fertility rate. There were 52 cases of multipara mothers with a university education or higher, accounting for 45.12% of the proportion of multipara mothers, and 88 cases of primiparous mothers with a university education or higher, accounting for 70.4% of the proportion of primiparous mothers, suggesting that the overall level of education of the study population is higher, which may be one of the reasons for the delay in the age of childbearing.

Educational level: The study's results showed that primigravid women's educational level was higher than that of multipara women, with 88 (36.6%) of them having a bachelor's degree or higher and 52 (21.7 %) of multipara women having a bachelor's degree or higher. Previous studies have shown that maternal literacy is a factor in postpartum post-traumatic stress disorder. Asadzadeh et al. (2020) and Hill et al. (2018) showed that positive labor experience is a protective factor for postpartum PTSD, and higher labor experience scores are associated with lower levels of postpartum stress disorder. Mothers with high literacy levels had lower labor experience than those with low levels(Bin et al., 2017; Kabakian-Khasholian et al., 2017). The main reason is that mothers with a high level of literacy have a wide range of knowledge and learning ability; the more knowledge they receive about pregnancy and childbirth, the higher their expectations of childbirth may be, and when medical personnel provide the same medical services, the satisfaction of mothers with a high level of literacy is lower; in addition, most of the mothers in this group of mothers are reluctant to express their expectations of childbirth, and they believe that there is only a tiny amount of information that can be provided in the public health service system. They are inclined to accept it rather than to They tend to accept rather than challenge it(Kabakian-Khasholian et al., 2017). Therefore, to reduce the level of postnatal post-traumatic stress disorder, health workers should provide personalized services according to the level of knowledge of mothers.

Mode of delivery: There were 62 spontaneous deliveries among the multipara women, accounting for 25.8% of all deliveries, which is higher than the proportion of spontaneous deliveries among the primigravid women, 17.9 %. The proportion of planned caesarean

section was higher, with 53 cases of primigravida, accounting for 22.1%, and 36 cases of multipara mothers, accounting for 15%. Several studies have shown (Wei et al., 2021; Ying, 2023; Zhao et al., 2020; Zichen et al., 2022) that cesarean section is a risk factor for postpartum PTSD. Postpartum women who have an emergency cesarean delivery are more likely to develop postpartum PTSD than those who have a spontaneous, planned cesarean delivery (Zichen et al., 2022). Emergency cesarean section is an unexpected and painful birth experience, which can further exacerbate the negative birth experience of the mother. Therefore, it is necessary to improve the psychological preparedness of mothers for labor, provide prenatal education on possible emergencies in labor and the interventions that can be used to alleviate the fear of emergencies, and provide continuous information and psychological support during labor.

4.3 Relationship between the number of deliveries and postpartum post-traumatic stress disorder in women with high-risk pregnancies: With the opening of the second and third-child policy, the number of deliveries has increased, and it is worth exploring whether the number of deliveries is a high-risk factor for postpartum PTSD. Xiangru et al. (2020) showed that PCL-C scores of primigravid women were higher than those of multipara women, indicating that primigravid women were more likely to suffer from postpartum PTSD. The results of the present study showed that multipara women were at increased risk of developing postpartum PTSD. It was considered that it might be related to the fact that most of the multipara women were older compared to primigravid mothers and that the previous maternal history caused adverse psychological stress to the mothers. Although the difference was not statistically significant compared with primigravida, it suggests that multipara women need more health education and psychological counselling. The results of this study suggest that there is no correlation between the number of deliveries and postpartum PTSD. This may be related to the following aspects: (1) Most of the reproducers gave birth voluntarily, and their first and second birth experiences did not adversely affect the mothers. With better social support, such as husband support, family support, and no severe psychological and economic burden, pregnant women are willing to give birth again; (2) Since the opening up of the two-child policy, various social facilities have been gradually improved, such as the cost of child-rearing and education, medical care, and housing, which reduces the pressure on the family and increases the confidence of women of childbearing age in giving birth again; (3) In the survey on women's willingness to give birth again, it is found that due to women's increased social status and autonomy and the change in their control over childbirth, primiparous women can choose whether to give birth to another child according to their wishes; (4) The State has increased the investment in medical care to support women's giving birth to another child. In recent years, the age of primiparous women has gradually increased, and the proportion of women of advanced maternal age has increased. With the increase in age, maternal comorbidities and complications have also gradually increased, so the state has increased medical investment, improved the medical level of primary obstetrics institutions, increased the number of free maternity checkups during pregnancy, eugenic screening and newborn checkups, increased the intensity of management of high-risk pregnancies and childbirths, and strengthened the system of high-risk referrals and follow-ups, in order to further protect maternal safety and give women the chance to have more children. The Government has also increased the intensity of its management of high-risk pregnant women, strengthened the system of high-risk referrals and follow-up visits, and further guaranteed the safety of pregnant women, giving them a sense of security.

5. CONCLUSION

In summary, PTSD in high-risk pregnancies is affected by many factors. To sum up, postnatal PTSD in high-risk pregnancies is affected by many factors. However, this study shows that there is no apparent correlation between the number of deliveries and postnatal PTSD; we do a good job in health education at different stages of preconception, pregnancy, delivery, and postnatal, and try to achieve a planned pregnancy, reduce the number of abortions after unplanned pregnancies, increase the rate of post-partum deliveries, reduce the risk of pregnancy, and safeguard the safety of pregnancy and childbirth. At the same time, in the postpartum period, the screening of PTSD should be strengthened, psychological counseling and guidance should be enhanced, potential PTSD patients should be found as early as possible, and early intervention should be made to minimize the consequences of postpartum PTSD.

LIMITATIONS

This study conducted a cross-sectional study of 240 high-risk pregnant women by convenient sampling method but only included women living in cities, and the representativeness of the research objects was slightly lacking. It is planned that in the next study, the sample size will be further expanded to study the parturients in multiple provinces and cities, to make the research results more widely available.

ACKNOWLEDGEMENT

There was no funding for this research.

Juan Zhu: Conceptualization, Formal analysis, Investigation, Methodology, Visualization, Writing - original draft. **Faridah Mohd Said**: Formal analysis, Methodology, Writing - review & editing. **Chun Hoe Tan**: Formal analysis, Methodology, Writing - review & editing.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

REFERENCES

Asadzadeh, L., Jafari, E., Kharaghani, R., & Taremian, F. (2020). Effectiveness of midwife-led brief counseling intervention on post-traumatic stress disorder, depression, and anxiety symptoms of women experiencing a traumatic childbirth: a randomized controlled trial. *Bmc Pregnancy and Childbirth, 20*(1), 1-9. https://doi.org/10.1186/s12884-020-2826-1

Bin, W., Qing, Y., Qing, L., Guimin, W., & Guihua, X. (2017). Investigation on the status quo and influencing factors of parturient childbirth experience. *Electronic Journal Of Practical Clinical Nursing Science* https://doi.org/CNKI:SUN:SLHL.0.2017-11-084

Center, N. H. C. S. I. (2018). 2017 China Health and Family Planning Statistical Yearbook. Retrieved from http://www nhc gov. cn/mohwsbwtx/jtjnj/202106/bb8 1a4c322594051 89689e6f7cfe5b8f/files/32ffd4397db24e f0a8ceflf75bbe61 ba

Cook, N., Ayers, S., & Horsch, A. (2018). Maternal posttraumatic stress disorder during the perinatal period and child outcomes: A systematic review. *J Affect Disord, 225*, 18-31. https://doi.org/10.1016/j.jad.2017.07.045

Dan, C., Jing, G., & Mertimine, A. (2022). Epidemiological characteristics of high-risk pregnant women in Xinjiang in 2021. *Bulletin Of Disease Controland Prevention, 37*(04), 56-58. https://doi.org/10.13215/j.cnki.jbyfkztb.2207008

de Graaff, L. F., Honig, A., van Pampus, M. G., & Stramrood, C. A. I. (2018). Preventing post-traumatic stress disorder following childbirth and traumatic birth experiences: a systematic review. *Acta Obstet Gynecol Scand, 97*(6), 648-656. https://doi.org/10.1111/aogs.13291

Delicate, A., Ayers, S., Easter, A., & McMullen, S. (2018). The impact of childbirth-related post-traumatic stress on a couple's relationship: a systematic review and meta-synthesis. *Journal of Reproductive Infant Psychology, 36*(1), 102-115. https://doi.org/10.1080/02646838.2017.1397270

Dikmen-Yildiz, P., Ayers, S., & Phillips, L. (2018). Longitudinal trajectories of post-traumatic stress disorder (PTSD) after birth and associated risk factors. *Journal of Affective Disorders, 229*, 377-385. https://doi.org/10.1016/j.jad.2017.12.074

Dozio, E., Feldman, M., Bizouerne, C., Drain, E., Laroche Joubert, M., Mansouri, M., et al. (2020). The Transgenerational Transmission of Trauma: The Effects of Maternal PTSD in Mother-Infant Interactions. *Front Psychiatry, 11*, 480690. https://doi.org/10.3389/fpsyt.2020.480690

Fengna, L., Qingfen, Z., Ying, H., & Hanqiong, D. (2024). Investigation and risk factors analysis of post-traumatic stress disorder in high risk pregnant women. *CHINESE JOURNAL OF FAMILY PLANNING & GYNECOTOKOLOGY, 16*(01), 84-88+92. https://doi.org/10.3969/j.issn.1674-4020.2024.01.23

Garthus-Niegel, S., Horsch, A., Handtke, E., Von Soest, T., Ayers, S., Weidner, K., et al. (2018). The impact of postpartum posttraumatic stress and depression symptoms on couples' relationship satisfaction: a population-based prospective study. *Frontiers in psychology, 9*, 1728. https://doi.org/10.3389/fpsyg.2018.01728

Hill, E., & Firth, A. (2018). Positive birth experiences: a systematic review of the lived experience from a birthing person's perspective. http://hdl.handle.net/10454/14860

Hongmei, Z., Mingying, G., & Qingyue, P. (2023). Analysis of risk factors of pregnancy women in Shanghai Pujin community. *Primary medicine Forum, 27*(02), 120-123. https://doi.org/10.19435/j.1672-1721.2023.02.039

Isaacs, N. Z., & Andipatin, M. G. (2020). A systematic review regarding women's emotional and psychological experiences of high-risk pregnancies. *Bmc Psychology, 8*, 1-11. *https://doi.org/10.1186/s40359-020-00410-8*

Jia-li, S., & Jia-lin, Y. (2022). Analysis of Maternal Health Management System from 2017 to 2021 in Dongcheng District of Beijing. *Chinese Primary Health Care, 36*(10), 69-72. https://doi.org/10.3969/j.issn.1001-568X.2022.10.0020

Kabakian-Khasholian, T., Bashour, H., El-Nemer, A., Kharouf, M., Sheikha, S., El Lakany, N., et al. (2017). Women's satisfaction and perception of control in childbirth in three Arab countries. *Reprod Health Matters, 25*(sup1), 16-26. doi:10.1080/09688080.2017.1381533

Ling, L., Xiaowen, H., & Ning, Y. (2017). Analysis of 4,545 Cases of Maternal Pregnancy and Delivery in Chancheng District of Foshan City. *Chinese Journal of Women And Children Health, 8*(1), 4. https://doi.org/CNKI:SUN:YZWS.0.2017-01-021

Magnus, M. C., Wilcox, A. J., Morken, N. H., Weinberg, C. R., & Håberg, S. E. (2019). Role of maternal age and pregnancy history in risk of miscarriage: prospective register based study. *Bmj, 364*, l869. https://doi.org/10.1136/bmj.l869

Majella, M. G., Sarveswaran, G., Krishnamoorthy, Y., Sivaranjini, K., Arikrishnan, K., & Kumar, S. G. (2019). A longitudinal study on high risk pregnancy and its outcome among antenatal women attending rural primary health centre in Puducherry, South India. *J Educ Health Promot, 8*, 12. https://doi.org/10.4103/jehp.jehp_144_18

Parker, J., Hofstee, P., & Brennecke, S. (2024). Prevention of Pregnancy Complications Using a Multimodal Lifestyle, Screening, and Medical Model. *J Clin Med, 13*(15). https://doi.org/10.3390/jcm13154344

Roberts, L., Davis, G. K., & Homer, C. S. (2019). Depression, anxiety, and post-traumatic stress disorder following a hypertensive disorder of pregnancy: a narrative literature review. *Frontiers in Cardiovascular Medicine, 6*, 147. https://doi.org/10.3389/fcvm.2019.00147

Rodrigues, P. B., Zambaldi, C. F., Cantilino, A., & Sougey, E. B. (2016). Special features of high-risk pregnancies as factors in development of mental distress: a review. *Trends in psychiatry and psychotherapy, 38*, 136-140. https://doi.org/10.1590/2237-6089-2015-0067

Schobinger, E., Stuijfzand, S., & Horsch, A. (2020). Acute and Post-traumatic Stress Disorder Symptoms in Mothers and Fathers Following Childbirth: A Prospective Cohort Study. *Front Psychiatry, 11*, 562054. https://doi.org/10.3389/fpsyt.2020.562054

Shaw, J. G., Asch, S. M., Katon, J. G., Shaw, K. A., Kimerling, R., Frayne, S. M., et al. (2017). Post-traumatic stress disorder and antepartum complications: A novel risk factor for gestational diabetes and preeclampsia. *Paediatric and Perinatal Epidemiology, 31*(3), 185-194. *https://doi.org/10.1111/ppe.12349*

Stuijfzand, S., Garthus-Niegel, S., & Horsch, A. (2020). Parental Birth-Related PTSD Symptoms and Bonding in the Early Postpartum Period: A Prospective Population-Based Cohort Study. *Front Psychiatry, 11*, 570727. https://doi.org/10.3389/fpsyt.2020.570727

Van Sieleghem, S., Danckaerts, M., Rieken, R., Okkerse, J. M. E., de Jonge, E., Bramer, W. M., et al. (2022). Childbirth related PTSD and its association with infant outcome: A systematic review. *Early Hum Dev, 174*, 105667. doi:10.1016/j.earlhumdev.2022.105667

Wei, J., Qi, X., Lingyan, Y., & Tieyoung, Z. (2021). Research progress of maternal psychological health issues after emergency cesarean section：a review. *CHINESE JOURNAL OF NURSING, 56*(9), 5. https://doi.org/10.3761/j.issn.0254-1769.2021.09.009

Xiao yun, Y., Hongai, Y., Qigui, L., & Li zhu, Y. (2007). Study on the validity, reliability and influencing factors of the civilian version of the post-traumatic stress Examination Scale. *China Journal of Health Psychology, 15*(1), 6-9(in Chinese). https://doi.org/10.3969/j.issn.1005-1252.2007.01.036

Yakupova, V., & Suarez, A. (2022). Postpartum PTSD and birth experience in Russian-speaking women. *Midwifery, 112*, 103385. https://doi.org/10.1016/j.midw.2022.103385

Ying, C. (2023). Postpartum post-traumatic stress disorder symptoms in high-risk pregnancies: Associated resilience and social support. *Journal of Psychosomatic Research, 165*, 111098. https://doi.org/10.3760/cma.j.cn115682-20200602-03701

Zhao, Y., Gao, Y., Sun, G., Yu, L., & Lin, Y. (2020). The effect of initiating neuraxial analgesia service on the rate of cesarean delivery in Hubei, China: a 16-month retrospective study. *BMC Pregnancy, 20*, 1-9. https://doi.org/10.1186/s 12884-O20-03294

Zhimin, Z., Jun, N., & Ling, J. (2023). Analysis of influencing factors of the adverse pregnancy outcomes of high-risk pregnant women. *Chinese Journal Of Family Planning & Gynecotokology,, 31*(2), 448-450. https://doi.org/10.3969/ j.issn.1004-8189.2023.02.044

Zichen, S., Zhengcia, Y., Haijiao, J., Liangfeng, W., & Weiping, C. (2022). The status and influencing factors of post-traumatic stress disorder after Childbirth. *Mod Med Health, 38*(10), 1682-1686+1692. https://doi.org/0.3969/j.issn.1009-5519.2022.10.014