

Analysis of the Characteristics and Influencing Factors of Perinatal Obsessive-Compulsive Symptoms in Elderly Parturients

Jialin Wang^{1,†}, Feifei Jia^{2,*†}

¹School of Psychology, Northeast Normal University, Changchun, Jilin, China

²Menopausal Health Center, Panjin Central Hospital, Panjin, Liaoning, China

*Correspondence: 15642777330@163.com (Feifei Jia)

[†]These authors contributed equally.

Abstract

Aims/Background Perinatal obsessive-compulsive symptoms are significant predictors of increased postpartum anxiety, depression, and bipolar disorder. These symptoms have persistent adverse effects on both mothers and children. Currently, there are few reports in the literature on obsessive-compulsive disorder in elderly parturient women in China. This study primarily discusses the clinical characteristics of perinatal obsessive-compulsive symptoms in elderly parturient women and analyzes their influencing factors, aiming to provide references for clinical prevention and treatment.

Methods This research employed a cross-sectional design, utilizing a convenience sampling method to select elderly parturients who delivered at Panjin Central Hospital from September 2022 to August 2023. The assessment instruments included a general data questionnaire, the Yale-Brown Obsessive Compulsive Scale (Y-BOCS), the self-rating anxiety scale (SAS), the Edinburgh Postpartum Depression Scale (EPDS), and the Sense of Coherence Scale (SOC-13). The relationship between the severity of obsessive-compulsive symptoms and negative emotions and psychological burden was examined through Pearson correlation analysis. Additionally, the influencing factors of perinatal obsessive-compulsive symptoms were analyzed using multivariate logistic regression.

Results In this study, a total of 124 questionnaires were distributed, and 122 valid questionnaires were recovered, yielding an effective recovery rate of 98.39%. Among the 122 elderly parturients, 37 were positive for perinatal obsessive-compulsive disorder, accounting for 30.33% (37/122). Among the 37 elderly parturients with perinatal obsessive-compulsive symptoms, 64.86% had both obsessive-compulsive thoughts and behaviors, 21.62% had obsessive-compulsive thoughts as the main symptom (8/37), and 13.51% had obsessive-compulsive behaviors (5/37). Multivariate logistic regression analysis showed that pregnancy history, pregnancy complications, fetal health, SOC-13 score, SAS score, and EPDS score were independent risk factors for positive perinatal obsessive-compulsive symptoms ($p < 0.05$).

Conclusion The incidence of perinatal obsessive-compulsive symptoms in elderly parturient women is high. Obsessive-compulsive thoughts primarily involve fears of injury and contamination, while obsessive-compulsive behaviors mainly consist of compulsive checking and cleaning. The occurrence of perinatal obsessive-compulsive disorder is associated with factors such as pregnancy and childbirth history, pregnancy complications, fetal health, negative emotions, and stress resistance.

Key words: elderly parturient women; perinatal period; obsessive-compulsive symptoms; influencing factors

Submitted: 23 April 2024 Revised: 28 July 2024 Accepted: 6 August 2024

How to cite this article:

Wang J, Jia F. Analysis of the Characteristics and Influencing Factors of Perinatal Obsessive-Compulsive Symptoms in Elderly Parturients. *Br J Hosp Med.* 2024. <https://doi.org/10.12968/hmed.2024.0202>

Copyright: © 2024 The Author(s).

Introduction

Childbirth, as a significant stress event in a woman's life, can have various impacts on the physical and psychological well-being of pregnant women, potentially influencing their families as well (Wigert et al, 2020). Clinically, pregnant women who are older than 35 years at the time of delivery are referred to as elderly parturients. In recent years, with the continuous improvement of the global economic level, the accelerating pace of society, and the rise in women's social status, more women are choosing late marriage and childbearing. Many women are engaged in careers, social activities, and personal development, delaying pregnancy and resulting in an increasing proportion of elderly parturients among all pregnant women (Frick, 2021). According to incomplete statistics (Cao et al, 2022), the filing rate of elderly pregnant women in some tertiary hospitals is as high as 60%, significantly higher than in previous years. Compared with younger women, elderly parturient women often have poorer physical health and a higher incidence of pregnancy complications, further exacerbating their perinatal psychological burden (Sun et al, 2023).

While China has begun to acknowledge the importance of addressing the mental health of elderly parturients during the perinatal period, current research primarily focuses on their delivery experiences and the risk of postpartum depression, with limited attention given to changes in their overall perinatal mental state (Hudepohl et al, 2022). Perinatal obsessive-compulsive disorder (OCD) is characterized by obsessive-compulsive thoughts and behaviors that occur during pregnancy or within six weeks after delivery. It can be categorized into two types: pregnancy-related OCD and postpartum OCD (Fairbrother et al, 2021). Pregnancy-related OCD primarily involves contamination concerns, where pregnant women worry about becoming contaminated and harming the fetus, often accompanied by repetitive examinations, cleaning, and washing. Postpartum OCD focuses on the newborn and involves fears of intentionally or unintentionally harming them, often associated with repetitive safety checks on the baby and strict maintenance of item order (Burton et al, 2022).

Prior research has indicated that perinatal OCD symptoms significantly contribute to the development of postpartum anxiety, depression, and bipolar disorder, while also exerting long-lasting negative effects on both the pregnant woman and the child (Osnes et al, 2020). Therefore, it is imperative to examine the features of perinatal OCD symptoms in elderly parturients and analyze the factors that influence them. Currently, there is a scarcity of domestic literature on OCD in older parturients. This study primarily focuses on exploring the clinical characteristics of perinatal OCD symptoms in elderly parturients and analyzing the factors contributing to their development. The aim is to provide valuable insights that could inform clinical prevention and treatment strategies.

Methods

Objects of Study

This research conducted a cross-sectional study using a convenience sampling method to select elderly parturients who gave birth at Panjin Central Hospital between September 2022 and August 2023. The inclusion criteria were as follows: (1) age 35 years or older, carrying a single fetus, and being in the perinatal stage from 28 weeks of pregnancy to 42 days postpartum; (2) no prior history of mental illness or central nervous system disease; (3) clear consciousness, enabling independent completion of the questionnaire or assistance from others; and (4) provision of informed consent and signature on the informed consent form. Participants were excluded if they had central neurological diseases or mental retardation preventing questionnaire completion or if they had severe somatic diseases.

To determine the sample size, the internationally accepted multi-factor analysis method (Saccetti and Timmerman, 2016) was employed, requiring a sample size that is 5–10 times the number of variables. This study included 11 variables and accounted for a 20% rate of invalid questionnaires, calculating the sample size as follows: $11 \times (5 + 10) \times (1 + 20\%) = 66$ to 132. Considering hospital conditions and other factors, the final sample size was determined to be 124 cases.

This study adhered to the principles outlined in the Helsinki Declaration. All participating pregnant women received both oral and written information regarding the study's purpose, voluntary participation, confidentiality, and anonymity. Only the researchers involved in this project had access to the data, ensuring the privacy of the participants during both the writing and publication processes. This study protocol was reviewed and approved by the Ethics Committee of Panjin Central Hospital, approval number No. PJZXYY-LW-20240701.

Method

Survey Tools

The primary findings of this study were as follows:

Firstly, a general data questionnaire was developed by the researchers. This questionnaire covers various aspects, including age, gestational week of delivery, education level, pregnancy history, mode of conception, presence of pregnancy complications, mode of pregnancy, and fetal health.

The Yale-Brown Obsessive Compulsive Scale (Y-BOCS) (Hauschildt et al, 2019) was utilized to assess obsessive-compulsive symptoms. The Y-BOCS consists of two subscales: the obsessive-compulsive symptom checklist and the obsessive-compulsive symptom severity scale. These subscales encompass 8 different types of obsessive-compulsive symptoms, such as hoarding or saving behaviors, religious obsessions, symmetry or precision concerns, physical compulsions, and fear of injury. The compulsive behaviors assessed include cleaning (e.g., repeated hand washing, cleaning the room, bathing), checking (e.g., repeatedly confirming whether the door is locked, whether the fire is out), repeating (e.g., stubbornly and constantly repeating seemingly meaningless activities), counting (e.g., praying, counting, repeating a word), and sorting (e.g., always placing things in a fixed order or position).

Each item on the scale was scored using a Likert 5-point scale, with 0 indicating the absence of symptoms and 4 indicating severe symptoms. The total score ranges from 0 to 40, with higher scores indicating more severe symptoms. A total score ≤ 9 indicates the absence of obsessive-compulsive symptoms, 10–15 represents mild symptoms, 16–25 denotes moderate symptoms, and >25 indicates severe symptoms. In this study, a total score ≥ 16 was adopted as the cutoff to identify positive obsessive-compulsive symptoms. The Cronbach's α coefficient of the Y-BOCS is 0.88, indicating satisfactory content and construct validity.

Anxiety: The subjects' anxiety state and severity were evaluated using the self-rating anxiety scale (SAS) (Dunstan and Scott, 2020). The scale consists of 20 items, each rated on a Likert 4-point scale ranging from "infrequent occurrence" to "almost constant occurrence". Of the 20 items, 15 were positively scored and 5 were reverse scored. The total score of the 20 items was calculated to obtain a rough score, which was then multiplied by 1.25 to obtain the standard score. A SAS standard score below 50 is considered normal, scores between 50–59 indicate mild anxiety, scores between 60–69 indicate moderate anxiety, and scores of 70 or higher indicate severe anxiety. The Cronbach's α coefficient for the scale is 0.800.

Depressive symptoms: The subjects' depressive symptoms and severity were assessed using the edinburgh postpartum depression scale (EPDS) (Oliveira et al, 2022). The scale consists of 10 items, each rated on a Likert 4-point scale ranging from "absent" to "always present". The total score ranges from 0 to 30, with higher scores indicating greater severity of depression. A score of 13 or higher is considered indicative of depressive symptoms. The Cronbach's α coefficient for the scale is 0.901.

Psychological burden: The level of psychological well-being and resilience of the subjects was evaluated using the sense of coherence scale (SOC-13) (Jin et al, 2022). This scale measures the individual's ability to utilize existing and potential resources to cope with stress and promote health. It consists of 13 items, which assess three dimensions: sense of control, sense of meaning, and sense of comprehensibility. Each item is rated on a Likert 7-point scale, ranging from 1 to 7, indicating the frequency of occurrence from "never" to "frequently". The scale achieves a cumulative score, indicating a higher level of psychological consistency and an enhanced ability to manage and alleviate stress, ultimately promoting overall well-being. The reliability of the scale was supported by a Cronbach's α coefficient of 0.78.

Investigation Methods

The investigators, who had received standardized training, conducted the survey through on-site questionnaire interviews within six weeks postpartum. A uniform procedure was followed to explain the purpose, importance, and instructions for filling out the survey to the participants. The privacy of the data was emphasized, and consent was obtained from the pregnant women before distributing the questionnaires. The participants filled out the questionnaires themselves, and any queries regarding the questionnaire were addressed by the investigators on the spot. Correctly completed questionnaires were collected immediately after verification.

Quality Control

(1) Research design stage: After reviewing relevant domestic and international literature on perinatal obsessive-compulsive disorder, we initially developed the study questionnaire. This version was refined through expert consultation and finalized based on feedback from a pilot survey.

(2) Investigation stage: Before starting the investigation, all investigators underwent comprehensive training to ensure proficiency in both the questionnaire content and evaluation methods. Participants were recruited from both outpatient and inpatient departments. Eligible elderly postpartum women were provided with information about the survey's purpose, significance, filling methods, and instructions. Following consent, the questionnaire was distributed for self-administration in a separate, quiet consultation room. Investigators used standardized language to guide participants, and one-on-one interviews were conducted on site, with questionnaires being distributed and collected immediately. For participants who had difficulty in understanding the questionnaire, a question-and-answer format was employed to assist them. All completed questionnaires were rigorously checked to ensure completeness and accuracy.

(3) Data compilation stage: Each questionnaire was meticulously reviewed before data entry, and any invalid responses were discarded. Data entry was performed by two individuals, with immediate corrections made for any errors to ensure the accuracy of the data.

Statistical Methods

SPSS 23.0 (International Business Machines Corporation, Armonk, NY, USA) was used for data processing. Measurement data conforming to a normal distribution are presented as mean \pm standard deviation and compared using a *t*-test. Categorical data are expressed as percentages or counts, with comparisons made using a chi-square test. Multivariate logistic regression was employed to explore factors influencing perinatal obsessive-compulsive symptoms in elderly parturients. Statistical significance was determined with a *p*-value of less than 0.05.

Results

General Data of the Subjects and Univariate Analysis of Perinatal Obsessive-Compulsive Disorder

In this investigation, a total of 124 questionnaires were distributed, with 122 collected and deemed valid, resulting in an effective recovery rate of 98.39%. Among the 122 elderly women who participated in the study, 37 tested positive for perinatal obsessive-compulsive disorder, accounting for 30.33% (37 out of 122). Of the 37 women with perinatal obsessive-compulsive symptoms, 64.86% exhibited both obsessive-compulsive thinking and behavior, 21.62% primarily displayed obsessive-compulsive thinking (8 out of 37), and 13.51% primarily exhibited obsessive-compulsive behavior (5 out of 37). In terms of obsessive-compulsive thinking, the most prevalent symptoms were fear of injury (48.65%) and fear of pollution (35.14%). For obsessive-compulsive behavior, the most common manifestations were check-

Table 1. Detection rate of different symptoms of perinatal obsessive-compulsive disorder (n = 37).

Type		n	Detection rate (%)
Obsessive-compulsive thinking	Fear of pollution	13	35.14
	Fear of injury	18	48.65
	Hoarding or saving	5	13.51
	Requiring symmetry or accuracy	8	21.62
	Physical compulsion	9	24.32
	Religion	2	5.41
	Related sex	2	5.41
	Other	8	21.62
Obsessive-compulsive behavior	Checking	19	51.35
	Washing	12	32.43
	Repeating	9	24.32
	Sorting	10	27.03
	Calculating	9	24.32
	Hoarding or saving	9	24.32
	Other	11	29.73

ing (51.35%) and cleaning (32.43%), as indicated in Table 1. The proportion of positive cases of perinatal obsessive-compulsive disorder showed significant differences among elderly parturients with varying pregnancy histories, complications, and fetal health ($p < 0.05$). However, no significant differences were found regarding other demographic and sociological characteristics ($p > 0.05$) (Table 2).

Comparison of the Scores of Negative Emotion and Psychological Burden in Elderly Women with Perinatal Obsessive-Compulsive Disorder

The SAS and EPDS scores for the perinatal obsessive-compulsive disorder positive group were significantly higher compared to those of the negative group, while the SOC-13 score was significantly lower. These differences were statistically significant (Table 3).

Multivariate Logistic Regression Analysis of Perinatal Obsessive-Compulsive Symptoms in Elderly Parturients

The independent variables for the multivariate logistic regression analysis were those with statistically significant differences in univariate analysis, as well as the presence of perinatal obsessive-compulsive symptoms in elderly parturients. The multivariate logistic regression model revealed that pregnancy history, pregnancy complications, fetal health status, SAS score, and EPDS score were independent risk factors for positive perinatal obsessive-compulsive symptoms ($p < 0.05$) (Table 4).

Table 2. General data of subjects and univariate analysis of perinatal obsessive-compulsive disorder (n = 122).

Project		n	Positive rate of perinatal obsessive-compulsive disorder (n/%)	χ^2	<i>p</i>
Age	35~40 years	101	29/28.71	0.724	0.395
	>40 years	21	8/38.10		
Gestational weeks	37 weeks+~	15	4/26.67	1.059	0.901
	38 weeks+~	36	11/30.56		
	39 weeks+~	42	14/33.33		
	40 weeks+~	18	6/33.33		
	41 weeks+~	11	2/18.18		
Education level	Junior high school and below	11	3/27.27	4.294	0.231
	Technical secondary school or senior high school	41	15/36.59		
	Junior college or bachelor degree	62	19/30.65		
	Graduate student or above	8	0/0.00		
History of pregnancy	First delivery	59	25/42.37	7.845	0.005
	Previous delivery	63	12/19.05		
Mode of conception	Natural pregnancy	83	26/31.33	0.122	0.727
	Assisted reproduction	39	11/28.21		
Pregnancy complication	Yes	49	20/40.82	4.263	0.039
	No	73	17/23.29		
Mode of pregnancy	Natural labor	69	21/30.43	0.001	0.977
	Cesarean section	53	16/30.19		
Fetal health condition	Normal	81	18/22.22	7.494	0.006
	Abnormal	41	19/46.34		

Table 3. Comparison of negative emotion and psychological burden scores of elderly parturients with perinatal obsessive-compulsive disorder (points).

Index	Perinatal obsessive-compulsive disorder positive group (n = 37)	Negative group of perinatal obsessive-compulsive disorder (n = 85)	<i>t</i>	<i>p</i>
SAS	64.14 ± 5.47	49.96 ± 5.15	13.719	<0.001
EPDS	15.73 ± 1.87	11.21 ± 2.28	10.599	<0.001
SOC-13	43.70 ± 3.41	53.87 ± 5.12	11.055	<0.001

Note: SAS is self-rating anxiety scale, EPDS is edinburgh postpartum depression scale, SOC-13 is sense of coherence scale.

Table 4. Logistic regression analysis of perinatal obsessive-compulsive symptoms in elderly parturients.

Factor	β	SE	Wald χ^2	<i>p</i>	OR	95% CI
History of pregnancy	0.599	0.236	6.450	0.008	1.821	1.147~2.892
Pregnancy complications	0.512	0.154	11.063	<0.001	1.669	1.234~2.257
Fetal health condition	0.562	0.175	10.310	<0.001	1.754	1.245~2.472
SAS	0.637	0.295	4.664	0.027	1.891	1.061~3.371
EPDS	0.512	0.212	5.838	0.012	1.669	1.102~2.529
SOC-13	0.242	0.089	7.403	0.002	1.274	1.070~1.517

Note: SAS is self-rating anxiety scale, EPDS is edinburgh postpartum depression scale, SOC-13 is sense of coherence scale.

Discussion

A collaborative study conducted by researchers from the United Kingdom and New Zealand discovered that approximately 11% of pregnant women experience symptoms of obsessive-compulsive disorder (OCD) during pregnancy, while around 60% develop OCD symptoms after giving birth (Brockington et al, 2006). In a longitudinal survey involving 1563 women, the prevalence of OCD during pregnancy was found to be approximately 2.5%, with a postpartum prevalence of about 4.2% (Osnes et al, 2019). Perinatal OCD can occur both as a standalone condition and in conjunction with other mental disorders. Previous investigations have indicated that about 27.5% of women with perinatal OCD also experience comorbid anxiety disorders, and around 70.6% suffer from depression (Guglielmi et al, 2014).

In this study, 122 elderly parturients were examined, with 37 cases testing positive for perinatal OCD, accounting for 30.33% of the sample (37/122). Among the 37 elderly women with perinatal obsessive-compulsive symptoms, 64.86% (24/37) exhibited both compulsive thinking and behavior, 21.62% (8/37) had compulsive thinking as the primary symptom, and 13.51% (5/37) had compulsive behavior as the primary symptom. The positive rate of perinatal OCD in this study was significantly higher than reported in Mahjani B and other literature (Mahjani et al, 2020). This increased prevalence may be attributed to the elderly age of the participants.

As women age, they undergo various physiological changes, such as alterations in hormone levels and decreased ovarian function, which can lead to physical and psychological instability and elevate the risk of perinatal OCD.

These findings suggest that obsessive-compulsive symptoms can have a serious impact on the perinatal life and health of elderly parturient women. It is essential to consider their individual differences and specific needs comprehensively, providing appropriate support and treatment. Through multidisciplinary collaboration, expertise and skills can be integrated to offer more effective treatment and support, ultimately improving the quality of life and health outcomes for these patients.

The survey results revealed that the most common obsessive-compulsive thoughts were related to fears of causing harm (48.65%) and contamination (35.14%). The most frequently observed obsessive-compulsive behaviors were compulsive checking (51.35%) and compulsive cleaning (32.43%). These findings may be attributed to the fact that the survey was conducted postpartum. At this stage, individuals with OCD often experience anxieties related to their newborn's health, such as fears of inadvertently harming the baby or inadequately disinfecting items like clothes and bottles. As a result, they engage in repetitive behaviors, such as checking the safety of the environment, arranging items in a specific order, and excessive hand washing.

Recent studies have indicated that parturients with perinatal obsessive-compulsive disorder are significantly more likely to develop preeclampsia and postpartum venous thromboembolism compared to those without the condition ([Phillips et al, 2022](#); [Pozza et al, 2021](#)). Nighttime compulsive checking of their newborns has been found to lead to reduced sleep quality, increased anxiety and depression, decreased self-confidence, and impaired social functioning among individuals with postpartum obsessive-compulsive disorder ([Ratzoni et al, 2021](#)). These consequences profoundly impact the quality of life for parturients, highlighting the importance of analyzing factors influencing perinatal obsessive-compulsive disorder in older women.

Multivariate logistic regression analysis showed that a history of multiple pregnancies, absence of pregnancy complications, normal fetal health, and SOC-13 scores were protective factors against positive perinatal obsessive-compulsive symptoms in elderly parturient women. In contrast, SAS and EPDS scores were identified as independent risk factors. The findings suggest a close relationship between the occurrence of positive perinatal obsessive-compulsive symptoms and factors such as maternal history, pregnancy complications, fetal health status, SAS scores, EPDS scores, and SOC-13 scores. Compared to younger parturients, elderly primiparae face additional challenges, including a lack of experience and understanding of the birthing process, societal and cultural expectations, and delivery-related pressures. These factors can heighten anxiety and stress levels, thereby increasing the risk of perinatal obsessive-compulsive disorder. A study has confirmed that perinatal complications during pregnancy, such as edema, preterm delivery, low birth weight, and low neonatal Apgar scores, can serve as predictive factors for the occurrence of perinatal obsessive-compulsive disorder ([Fairbrother et al, 2022](#)).

According to biological theory, dysfunctions in neurotransmitters and hormones can contribute to the development of perinatal obsessive-compulsive disorder. During the perinatal period, significant fluctuations in estrogen and progesterone levels can impact the secretion of serotonin and dopamine, potentially leading to the onset of perinatal obsessive-compulsive disorder. Research suggests that following childbirth, women often experience intrusive thoughts about intentionally or accidentally harming their babies due to the formation of new attachment relationships and increased stress (Collardeau et al, 2019). If patients excessively focus on these intrusive thoughts and attempt various methods to alleviate the distress they cause, this can progress into postpartum obsessive-compulsive disorder.

A study has shown that negative emotions are both a cause and a consequence of obsessive-compulsive symptoms (Holingue et al, 2021). Common negative emotions associated with obsessive-compulsive disorder include anxiety and depression. Evidence indicates that obsessive-compulsive symptoms often arise from distorted cognition, where irrational beliefs about events lead to adverse emotional reactions. Individuals then engage in specific behaviors to temporarily alleviate these negative emotions. However, recognizing that these behaviors are incorrect can result in self-remorse and self-disgust, which intensify negative emotions and further reinforce obsessive-compulsive behavior, creating a vicious cycle (Thompson et al, 2023).

The SAS and EPDS scores of the perinatal obsessive-compulsive disorder positive group were significantly higher compared to those of the negative group, while the SOC-13 score was significantly lower. These differences were statistically significant. This suggests that the severity of perinatal obsessive-compulsive disorder increases with higher levels of anxiety and depression and is less severe when individuals have better resilience. Therefore, implementing targeted interventions based on the negative moods of pregnant women could improve their ability to manage stress and reduce the incidence of perinatal obsessive-compulsive disorder.

Conclusion

In conclusion, perinatal obsessive-compulsive disorder is highly prevalent, with obsessive-compulsive thoughts primarily centered on fears of harm and contamination, and behaviors focused on compulsive checking and cleaning. The occurrence of perinatal obsessive-compulsive disorder is associated with factors such as pregnancy history, complications during pregnancy, fetal health, negative emotions, and stress resilience. Clinical interventions can be effective in reducing the incidence of this disorder. However, this study has limitations, including the lack of longitudinal observation of changes in perinatal obsessive-compulsive disorder. Future research will aim to increase the sample size and thoroughly investigate the evolving patterns and influential factors of perinatal obsessive-compulsive disorder in older women.

Key Points

- Maternal obsessive-compulsive thoughts primarily involve fears of causing harm.
- Maternal compulsive behaviors are mainly characterized by compulsive checking.
- The occurrence of maternal obsessive-compulsive disorder is associated with maternal history and psychological factors.
- Maternal obsessive-compulsive disorder is closely linked to fetal health.

Availability of Data and Materials

All data included in this study are available upon request by contact with the corresponding author.

Author Contributions

JLW and FFJ made substantial contributions to the concept and design of the review. JLW drafted the manuscript. Both authors contributed to important editorial changes in the manuscript. Both authors read and approved the final manuscript. Both authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

This study protocol was reviewed and approved by the Ethics Committee of Panjin Central Hospital, approval number No. PJZXYY-LW-20240701. All participating pregnant women received both oral and written information regarding the study's purpose, voluntary participation, confidentiality, and anonymity, and informed consent was obtained from all study participants.

Acknowledgement

Not applicable.

Funding

This research received no external funding.

Conflict of Interest

The authors declare no conflict of interest.

References

- Brockington IF, Macdonald E, Wainscott G. Anxiety, obsessions and morbid preoccupations in pregnancy and the puerperium. *Archives of Women's Mental Health*. 2006; 9: 253–263.

<https://doi.org/10.1007/s00737-006-0134-z>

- Burton HAL, Pickenhan L, Carson C, Salkovskis P, Alderdice F. How women with obsessive compulsive disorder experience maternity care and mental health care during pregnancy and postpartum: A systematic literature review. *Journal of Affective Disorders*. 2022; 314: 1–18. <https://doi.org/10.1016/j.jad.2022.06.041>
- Cao J, Xu W, Liu Y, Zhang B, Zhang Y, Yu T, et al. Trends in maternal age and the relationship between advanced age and adverse pregnancy outcomes: a population-based register study in Wuhan, China, 2010–2017. *Public Health*. 2022; 206: 8–14. <https://doi.org/10.1016/j.puhe.2022.02.015>
- Collardeau F, Corbyn B, Abramowitz J, Janssen PA, Woody S, Fairbrother N. Maternal unwanted and intrusive thoughts of infant-related harm, obsessive-compulsive disorder and depression in the perinatal period: study protocol. *BMC Psychiatry*. 2019; 19: 94. <https://doi.org/10.1186/s12888-019-2067-x>
- Dunstan DA, Scott N. Norms for Zung's Self-rating Anxiety Scale. *BMC Psychiatry*. 2020; 20: 90. <https://doi.org/10.1186/s12888-019-2427-6>
- Fairbrother N, Collardeau F, Albert AYK, Challacombe FL, Thordarson DS, Woody SR, et al. High Prevalence and Incidence of Obsessive-Compulsive Disorder Among Women Across Pregnancy and the Postpartum. *The Journal of Clinical Psychiatry*. 2021; 82: 20m13398. <https://doi.org/10.4088/JCP.20m13398>
- Fairbrother N, Collardeau F, Woody SR, Wolfe DA, Fawcett JM. Postpartum Thoughts of Infant-Related Harm and Obsessive-Compulsive Disorder: Relation to Maternal Physical Aggression Toward the Infant. *The Journal of Clinical Psychiatry*. 2022; 83: 21m14006. <https://doi.org/10.4088/JCP.21m14006>
- Frick AP. Advanced maternal age and adverse pregnancy outcomes. *Best Practice & Research. Clinical Obstetrics & Gynaecology*. 2021; 70: 92–100. <https://doi.org/10.1016/j.bpobgyn.2020.07.005>
- Guglielmi V, Vulink NCC, Denys D, Wang Y, Samuels JF, Nestadt G. Obsessive-compulsive disorder and female reproductive cycle events: results from the OCD and reproduction collaborative study. *Depression and Anxiety*. 2014; 31: 979–987. <https://doi.org/10.1002/da.22234>
- Hauschildt M, Dar R, Schröder J, Moritz S. Congruence and discrepancy between self-rated and clinician-rated symptom severity on the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) before and after a low-intensity intervention. *Psychiatry Research*. 2019; 273: 595–602. <https://doi.org/10.1016/j.psychres.2019.01.092>
- Holingue C, Samuels J, Guglielmi V, Ingram W, Nestadt G, Nestadt PS. Peripartum complications associated with obsessive compulsive disorder exacerbation during pregnancy. *Journal of Obsessive-Compulsive and Related Disorders*. 2021; 29: 100641. <https://doi.org/10.1016/j.jocrd.2021.100641>
- Hudepohl N, MacLean JV, Osborne LM. Perinatal Obsessive-Compulsive Disorder: Epidemiology, Phenomenology, Etiology, and Treatment. *Current Psychiatry Reports*. 2022; 24: 229–237. <https://doi.org/10.1007/s11920-022-01333-4>
- Jin Y, Bi Q, Song G, Wu J, Ding H. Psychological coherence, inclusive leadership and implicit absenteeism in obstetrics and gynecology nurses: a multi-site survey. *BMC Psychiatry*. 2022; 22: 525. <https://doi.org/10.1186/s12888-022-04137-1>
- Mahjani B, Klei L, Hultman CM, Larsson H, Devlin B, Buxbaum JD, et al. Maternal Effects as Causes of Risk for Obsessive-Compulsive Disorder. *Biological Psychiatry*. 2020; 87: 1045–1051. <https://doi.org/10.1016/j.biopsych.2020.01.006>
- Oliveira TA, Luzetti GGCM, Rosalém MMA, Mariani Neto C. Screening of Perinatal Depression Using the Edinburgh Postpartum Depression Scale. *Revista Brasileira De Ginecologia E Obstetricia*. 2022; 44: 452–457. <https://doi.org/10.1055/s-0042-1743095>
- Osnes RS, Eberhard-Gran M, Follestad T, Kallestad H, Morken G, Roaldset JO. Mid-pregnancy insomnia is associated with concurrent and postpartum maternal anxiety and obsessive-compulsive symptoms: A prospective cohort study. *Journal of Affective Disorders*. 2020; 266: 319–326. <https://doi.org/10.1016/j.jad.2020.01.140>
- Osnes RS, Roaldset JO, Follestad T, Eberhard-Gran M. Insomnia late in pregnancy is associated with perinatal anxiety: A longitudinal cohort study. *Journal of Affective Disorders*. 2019; 248: 155–165. <https://doi.org/10.1016/j.jad.2019.01.027>
- Phillips WL, Keim SA, Crerand CE, Jackson JL. Maternal Obsessive-Compulsive Symptoms and Infant Feeding Practices. *Breastfeeding Medicine*. 2022; 17: 259–268. <https://doi.org/10.1089/bfm.2021.0062>

- Pozza A, Marazziti D, Mucci F, Angelo NL, Prestia D, Dèttore D. Sexual response in obsessive-compulsive disorder: the role of obsessive beliefs. *CNS Spectrums*. 2021; 26: 528–537. <https://doi.org/10.1017/S1092852920001649>
- Ratzoni N, Doron G, Frenkel TI. Initial Evidence for Symptoms of Postpartum Parent-Infant Relationship Obsessive Compulsive Disorder (PI-ROCD) and Associated Risk for Perturbed Maternal Behavior and Infant Social Disengagement From Mother. *Frontiers in Psychiatry*. 2021; 12: 589949. <https://doi.org/10.3389/fpsy.2021.589949>
- Saccenti E, Timmerman ME. Approaches to Sample Size Determination for Multivariate Data: Applications to PCA and PLS-DA of Omics Data. *Journal of Proteome Research*. 2016; 15: 2379–2393. <https://doi.org/10.1021/acs.jproteome.5b01029>
- Sun M, Luo M, Wang T, Wei J, Zhang S, Shu J, et al. Effect of the interaction between advanced maternal age and pre-pregnancy BMI on pre-eclampsia and GDM in Central China. *BMJ Open Diabetes Research & Care*. 2023; 11: e003324. <https://doi.org/10.1136/bmjdr-2023-003324>
- Thompson KA, White JP, Bardone-Cone AM. Associations between pressure to breastfeed and depressive, anxiety, obsessive-compulsive, and eating disorder symptoms among postpartum women. *Psychiatry Research*. 2023; 328: 115432. <https://doi.org/10.1016/j.psychres.2023.115432>
- Wigert H, Nilsson C, Dencker A, Begley C, Jangsten E, Sparud-Lundin C, et al. Women's experiences of fear of childbirth: a metasynthesis of qualitative studies. *International Journal of Qualitative Studies on Health and Well-Being*. 2020; 15: 1704484. <https://doi.org/10.1080/17482631.2019.1704484>