PREVALENCE AND ASSOCIATED FACTORS OF POSTPARTUM DEPRESSION AMONG WOMEN IN BUON MA THUOT CITY, VIETNAM

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ABSTRACT

Postpartum depression (PPD) is a widespread condition that can severely impact both mothers and their children. Its prevalence varies across regions, and in the Central Highlands, PPD often remains undiagnosed and untreated. This study aims to determine the prevalence of PPD and identify the associated factors among women residing in Buon Ma Thuot City. A cross-sectional study was conducted involving 363 women with infants aged 4 to 48 weeks. PPD was assessed using the Edinburgh Postnatal Depression Scale (EPDS), with related factors evaluated through a semi-structured questionnaire. The findings revealed a PPD prevalence of 12.7% (95% CI: 9.2% - 16.1%) at an EPDS cut-off score of 13. Multivariate analysis identified several significant risk factors, including living alone (PR = 2.81, p = 0.008), low income (PR = 2.23, p = 0.010), dissatisfaction from the husband's family regarding the child's gender (PR = 2.31, p < 0.045), and marital conflict (PR = 5.84, p < 0.001). These findings highlight the considerable prevalence of PPD in Buon Ma Thuot City, with key contributing factors rooted in family dynamics, socioeconomic status, and cultural attitudes. Addressing these risk factors through comprehensive interventions is crucial for reducing the incidence of PPD and improving maternal well-being.

Keywords: *Postpartum depression (PPD), related factors, EDPS, Buon Ma Thuot city.*

1. INTRODUCTION

Postpartum depression (PPD) is a mood disorder that can develop within the first year after childbirth, posing significant risks to both the mother and the child. Affected mothers may experience declines in physical and mental health, difficulties in social interaction, and an increased likelihood of engaging in risky behaviors. For children, PPD may hinder growth, disrupt sleep patterns, and affect cognitive, motor, and social-emotional development. It may also impair crucial aspects of the mother-child bond, such as attachment and breastfeeding (Slomian, J., et al., 2019).

A systematic review of 565 studies across 80 countries revealed an average prevalence of PPD at 17.2%. The highest prevalence was observed in South Africa (39.96%; 95% CI 27.81-53.48), while Southeast Asia showed a lower prevalence of 13.53% (95% CI 11.00-16.52). The review highlighted that PPD prevalences significantly varied depending on factors like marital status, education, social support, spousal care, violence, gestational age, breastfeeding, child mortality, pregnancy planning, financial challenges, partner relationships, life stress, smoking, alcohol use, and living conditions (Wang, Z., et al., 2021). In Vietnam, studies on PPD and its influencing factors show variability in prevalence across different research. A review of 18 studies conducted between 2010 and 2020 indicated a wide range of PPD prevalences, from 8.2% to 48.1%. Factors linked to PPD in these studies include low education, lack of knowledge, history of psychological trauma, insufficient family support, poor marital relationships, caring for sick children, intimate partner violence, child gender preference, economic hardship, rural living, and lack of social support (Huong Thi Thanh Nguyen, et al., 2021).

PPD is a significant health issue in Vietnam, yet it has not received adequate attention from society or the healthcare sector. Many mothers with PPD go undiagnosed, and many postpartum women tend to ignore, underestimate, or deny their condition. In the Central Highlands, particularly, research on PPD is limited. To contribute more data on this issue, a study was conducted in Buon Ma Thuot city with two main objectives: (i) to determine the prevalence of PPD among women in the city and (ii) to identify the factors related to PPD in the study population.

2. MATERIALS AND RESEARCH METHODS

2.1. Research subjects and materials

2.1.1. Research Subjects. The study focuses on

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women residing in Buon Ma Thuot City who have children aged 4 to 48 weeks.

- Inclusion Criteria: Women with children between 4 and 48 weeks old; Registered residents of Buon Ma Thuot City; Registered for vaccination at one of the 8 ward health stations in Buon Ma Thuot City; Willing to participate in the study.

- Exclusion Criteria: Not cognitively capable of answering the question; Failure to complete the full interview questionnaire; Previously interviewed and completed the questionnaire (participants are interviewed only once).

2.1.2 Research materials. A semi-structured questionnaire was used to conduct interviews with mothers. PPD was assessed using the Vietnamese version of the Edinburgh Postnatal Depression Scale (EPDS). This scale contains 10 questions, each scored between 0 and 3 points. The total score ranges from 0 to 30. The EPDS is specifically designed to screen for depression in postpartum women and has proven to be an effective tool for identifying depression in community settings.

2.2. Research methods

2.2.1. Research design

A cross-sectional study was conducted on 363 women with young children from March 2023 to September 2023.

2.2.2. Research sample size

Use the formula for calculating sample size to estimate a proportion:

$$n = Z^2_{1-\alpha/2} \times \frac{p \times (1-p)}{d^2}$$

Where n: Study sample size; Z = 1.96 (α = 0.05); p = 0.181 (PPD prevalence is referenced from the study of Nguyen Thi Hoai Tam et al. in 2019); d: = 0.04

The estimated sample size is 356. In fact, the study collected 363 women who met the inclusion criteria.

2.2.3. Sampling Technique

A consecutive sampling method will be used. Weekly, on a designated day, ward health stations conducted free vaccination clinics for infants under 1 year old. The investigative team recruited mothers attending these clinics by comparing their eligibility to a predetermined selection criteria. This process continued until a sample size of 363 mothers was achieved.

2.2.4. Main Variables

Background and Exposed Variables: Age/ Education level/ Occupation/ Marital status/ Religion.

Ethnicity/ Family economic status/ Maternal reproductive health/ Child health/ Postpartum care and family support.

Outcome Variable: PPD will be assessed using the Vietnamese version of the EPDS. A total EPDS score of ≥ 13 indicates the presence of PPD, while a score < 13 indicates its absence.

2.2.5. Data Collection Method

The study targeted women with children aged 4 to 48 weeks attending ward health stations for immunization. Eligible participants were screened based on inclusion and exclusion criteria and invited to join the study. Weekly, fourth-year medical students conducted face-to-face interviews with these mothers using a structured questionnaire until the sample size of 363 was reached.

The questionnaire comprised six sections: demographic information, mental health (10 EPDS-based questions), reproductive health, child's health, postpartum care and family support, and family/marital conflicts. The process was systematically implemented to ensure data accuracy and reliability.

2.2.6. Data Processing and Analysis

Data were entered using EpiData 3.1 software and analyzed with Stata 16. The Chi-square test was used to compare depression prevalences between groups, with a significance threshold of $p < 0.05$. The association between exposure factors and PPD was assessed using the Prevalence Ratio (PR) index.

Multivariate analysis (Robust Poisson regression) was conducted by including variables with $p < 0.20$ in univariate analysis. Variables with $p > 0.05$ were gradually excluded, and the final model retained only those with $p < 0.05$. The Prevalence Ratio (PR) index was used to report Poisson regression results.

The reliability of the EPDS scale was evaluated using Cronbach's Alpha. A Cronbach's Alpha value of ≥ 0.8 was considered a good and acceptable measure of scale reliability for this study.

2.2.7. Research Ethics

The study received approval from the protocol review board of the Faculty of Medicine and Pharmacy, Tay Nguyen University. Data collection in the community was authorized by the Health Center and Ward Health Stations in Buon Ma Thuot City, with informed consent obtained from all participants. Confidentiality of participants' personal information was strictly maintained. Upon completion of data analysis, results were compiled and presented in tables and charts.

3. RESULTS AND DISCUSSION

Buon Ma Thuot City has 11 ward health stations, of which eight were selected for this study: Thong Nhat, Tan Tien, Tan Thanh, Thanh Nhat, Ea Tam, Tan Lap, Tan Loi, and Tan An. These health stations are responsible for organizing and managing vaccination programs for children. During vaccination sessions, mothers with children in the target age group were approached and interviewed using a structured questionnaire.

The study was limited to eight health stations due to insufficient personnel to cover all 11 stations in the city. However, the selected stations are considered representative of the remaining health stations, ensuring the generalizability of the findings.

The diagnosis of depression requires a comprehensive assessment of symptoms and individual circumstances by trained mental health professionals, which can be both time-intensive and costly. To address this challenge, the EPDS offers a rapid and efficient screening method for PPD within community settings. This tool is particularly valuable in resource-limited areas, enabling the early identification of mothers who may require further evaluation and support. Globally, the EPDS is widely utilized, with approximately 68% of studies incorporating this instrument (Moraes et al., 2017).

In Vietnam, the EPDS has been translated, validated, and recommended for screening depression in pregnant and postpartum women. Different studies, however, employ varying cut-off scores. For example, Bang Thi Hoai (2018), Le Thi My Nhung (2021), Huynh Nguyen Phuong Quang (2021), and Nguyen Hoai Thao Tam (2019) used a cut-off score of 13, whereas Tran Tho Nhi (2023) applied a threshold of less than 13. This study adopted a cut-off score of ≥13 to define depression, consistent with the majority of national studies, thereby enhancing comparability. Moreover, this threshold minimizes the occurrence of false-positive cases, reducing unnecessary distress among participants.

The study utilized the Vietnamese version of the EPDS tool, and the analysis revealed a Cronbach's Alpha value of 0.87, indicating high reliability. Among the 363 women surveyed, the average age was 30 ± 5.2 years. The majority (98.3%) were over 20 years old, 4.4% had a primary education level or less, 82.9% were of Kinh ethnicity, and 10% reported difficult financial circumstances.

Prevalence of PPD

Using a cut-off score of 13 on the EPDS scale, 46 out of 363 surveyed women were identified with PPD, representing 12.7% (95% CI: 9.2% - 16.1%). This prevalence aligns with the range of 8.2% to 48.1% reported in a meta-analysis of studies conducted in Vietnam between 2010 and 2020 (Huong Thi Thanh Nguyen et al., 2021). When compared to international findings, our study's prevalence falls within the global range of 3% to 41% (Hahn-Holbrook, J., et al., 2017).

Table 1. Prevalences of postpartum depression according to some maternal demographic characteristics

Characteristics	PPD (%)	Non-PPD (%)	PR (95% CI)	p-value
Mother's age				
< 20 years old	*2 (33.3)*	*4 (66.7)*	*2.70 (0.84-8.67)*	*0.125*
≥ 20 years old	*44 (12.3)*	*313 (87.7)*	-	
Single mother				
Yes	*8 (47.1)*	*9 (52.9)*	*4.28 (2.38-7.70)*	*< 0.001*
No	*38 (11.0)*	*308 (89.0)*	-	
Mother's Education				
Illiterate/ Primary	*3 (18.8)*	*13 (81.2)*	-	
Middle school/ High school	*28 (15.1)*	*158 (84.9)*	*1.25 (0.42-3.65)*	*0.210*
High school+	*15 (9.3)*	*146 (90.7)*	*2.01 (0.65-6.22)*	
Mother's Occupation				
Civil Servant/ Employee/ Trader	*20 (12.7)*	*137 (87.3)*	-	
Worker/ Farmer	*2 (5.9)*	*32 (94.1)*	*2.17 (0.53-8.83)*	*0.433*
Housewife/ Other	*24 (13.9)*	*148 (86.1)*	*0.91 (0.53-1.59)*	
Mother's ethnicity				
E De	*13 (21.0)*	*49 (79.0)*	*1.91 (1.07-3.42)*	*0.031*
Kinh	*33 (11.0)*	*268 (89.0)*	-	

Characteristics		PPD (%)	Non-PPD (%)	PR (95% CI)	p-value
Low maternal income					
	Yes	*13 (36.1)*	*23 (63.9)*	*3.58 (2.08-6.15)*	*< 0.001*
	No	*33 (10.1)*	*294 (89.9)*	-	

PR (Prevalence Ratio) ; CI (Confidence Interval)

Based on previous studies, the prevalence of PPD in Buon Ma Thuot City falls within both national and international ranges. Variations in PPD prevalences across studies can be attributed to differences in measurement tools, timing of subject selection post-childbirth, study settings (community vs. hospital), and rural or urban environments. With a PPD prevalence of 12.7%, it highlights a significant public health concern in the city. The health sector should introduce screening programs, early detection, and provide psychological support to postpartum women to prevent adverse outcomes for both mother and child. Routine screening for PPD at vaccination sites such as ward health stations, where most mothers with children under 1 year old come to get their children vaccinated, could be considered.

Factors associated with PPD

Factors associated with PPD were identified through univariate analysis. Mothers not living with their partner or husband had a significantly higher risk of PPD compared to those living with their partner (PR=4.28; $p < 0.001$). Similarly, mothers facing economic hardship were more likely to experience PPD than those with stable finances (PR=3.58; $p < 0.001$). These findings highlight the stress that social and financial pressures place on mothers, increasing their vulnerability to depression. This aligns with previous studies, including those by Le Thi My Nhung et al. (2021) and Agrawal et al. (2022). Notably, this study also found that Ede mothers had a higher prevalence of PPD compared to Kinh mothers (PR=1.91; $p = 0.031$), likely due to the additional family pressures women may face in Ede's matriarchal society.

We found no significant association between maternal reproductive characteristics-such as a history of miscarriage, cesarean section, or the number of children-and PPD. While these factors may seem intuitively related to PPD, current evidence suggests they may not play a significant role. On the other hand, child health factors such as night crying (PR=2.33; p=0.002) and poor weight gain (PR=1.76; p=0.042) were strongly linked to an increased risk of PPD. These findings are consistent with research results in Vietnam (Nguyen Hoai Thao Tam et al., 2019; Bang Thi Hoai et al., 2018; Huynh Nguyen Phuong Quang et al., 2021) and align with global studies (Agrawal, I. et al., 2022; Wang, Z. et al., 2021). This emphasizes the need to address maternal mental health through pediatric care and early intervention for children experiencing health issues.

Table 2. Prevalence of postpartum depression according to some characteristics of mothers and child

	Variables		PPD (%)	Non-PPD (%)	PR (95% CI)	p-value
MOTHER	miscarriage/abortion					
		Yes	*12 (17.9)*	*55 (82.1)*	*1.56 (0.85-2.85)*	*0.153*
		No	*34 (11.5)*	*262 (88.5)*	-	
	cesarean section					
		Yes	*27 (14.7)*	*157 (85.3)*	*1.38 (0.80-2.40)*	*0.245*
		No	*19 (10.6)*	*160 (89.4)*	-	
	number of children					
		< 3 children	*36 (13.3)*	*235 (86.7)*	*1.22 (0.63-2.36)*	*0.547*
		≥ 3 children	*10 (10.9)*	*82 (89.1)*	-	
	has no son					
		Yes	*17 (15.2)*	*95 (84.8)*	*1.31 (0.75-2.29)*	*0.338*
		No	*29 (11.6)*	*222 (88.4)*	-	
	has no daughter					
		Yes	*37 (14.3)*	*221 (85.7)*	*1.67 (0.84-3.34)*	*0.134*
		No	*9 (8.6)*	*96 (91.4)*	-	

	night crying				
	Yes	*20 (22.2)*	*70 (77.8)*	*2.33 (1.37-3.97)*	*0.002*
	No	*26 (9.5)*	*247 (90.5)*	-	
	not exclusively breastfed				
	Yes	*30 (15.4)*	*165 (84.6)*	*1.62 (0.91-2.86)*	*0.094*
	No	*16 (9.5)*	*152 (90.5)*	-	
CHILD	weight gain				
	little gain/ weight loss	*30 (16.1)*	*156 (83.9)*	*1.76 (1.01-3.16)*	*0.042*
	gain ≥ 1000 grams	*16 (9.0)*	*161 (91.0)*	-	
	child's health				
	have chronic diseases	*18 (15.8)*	*96 (84.2)*	*1.40 (0.81-2.43)*	*0.227*
	don't have chronic diseases	*28 (11.2)*	*221 (88.8)*	-	

PR (Prevalence Ratio) ; CI (Confidence Interval)

The study found that various family and social factors were significantly associated with PPD. These included lack of help with housework (PR=3.43; p<0.001), disapproval from the husband's family regarding the child's gender (PR=6.16; p<0.001), poor relationships with the husband or his family (PR=6.53; p<0.001), inability to confide in the husband (PR=3.79; p=0.003), threats or physical abuse by the husband (PR=3.95; p<0.001), and forced sex by the husband (PR=5.06; p<0.001). These factors appear to be primary contributors to PPD. Similar associations have been observed in studies conducted in Vietnam and other countries (Tran, N. T., et al., 2018; Tran Tho Nhi, et al., 2023; Agrawal, I., et al., 2022; Wang, Z., et al., 2021).

Table 3. Prevalence of postpartum depression based on various social factors

Variables		PPD (%)	Non-PPD (%)	PR (95% CI)	p-value
Mothers are not helped with housework					
	Yes	*8 (38.1)*	*13 (61.9)*	*3.43 (1.84-6.39)*	*< 0.001*
	No	*38 (11.1)*	*304 (88.9)*		
Husband's family doesn't likes the baby's current gender					
	Yes	*9 (64.3)*	*5 (35.7)*	*6.16 (3.74-10.14)*	*< 0.001*
	No	*36 (10.4)*	*309 (89.6)*		
Discord with husband/in-law's family					
	Yes	*38 (23.3)*	*125 (76.7)*	*6.53 (3.00-14.22)*	*< 0.001*
	No	*7 (3.6)*	*189 (96.4)*		
Can't confide in husband					
	Yes	*4 (44.4)*	*5 (55.6)*	*3.79 (1.73-8.32)*	*0.003*
	No	*41 (11.7)*	*309 (88.3)*		
Husband threatens / beats					
	Yes	*7 (43.8%)*	*9 (56.2%)*	*3.95 (2.10-7.42)*	*< 0.001*
	No	*38 (11.1%)*	*305 (88.9%)*		
Husband forced sex					
	Yes	*3 (60.0%)*	*2 (40.0%)*	*5.06 (2.34-10.92)*	*0.001*
	No	*42 (11.9%)*	*312 (88.1%)*		

PR (Prevalence Ratio) ; CI (Confidence Interval)

Multivariate Analysis

In the multivariate analysis, factors that reached a significance level of $p < 0.2$ were included in a Poisson regression model to control for confounding or interaction effects (Hosmer, D. W., & Lemeshow, S., 2000). The final analysis identified four key factors with the most significant impact on PPD:

(i) Being a single mother: Single mothers, especially those without a support system, face immense challenges in caring for their child alone. The lack of emotional and financial support increases their susceptibility to depression.

(ii) Economic hardship: As previously mentioned, financial struggles are a consistent predictor of PPD, emphasizing the need for social safety nets and financial support for new mothers.

(iii) Family disapproval of the child's gender: Cultural pressures surrounding the child's gender can be emotionally draining, especially in patriarchal societies where male children are often preferred.

(iv) Marital conflict: Unresolved conflicts within the marriage can erode the emotional stability of the household, leaving the mother vulnerable to mental health disorders.

PPD is a multifaceted issue influenced by a range of social, economic, and familial factors. By recognizing and addressing these key contributors - such as relationship dynamics, financial stress, cultural expectations, and child health issues - healthcare providers and policymakers can create more effective interventions. Supporting mothers through counseling, financial aid, and family mediation can significantly reduce the prevalence of PPD, leading to healthier mothers and families.

Table 4. Association between postpartum depression and some factors after multivariate analysis

Variables		PR	95% CI	p-value
single mothers				
	Yes	2.81	1.31 – 6.00	0.008
	No	-		
low maternal income				
	Yes	2.23	1.21 - 4.21	0.010
	No	-		
husband's family doesn't like the baby's current gender				
	Yes	2.31	1.15 – 5.54	< 0.045
	No	-		
conflict/argument with husband				
	Yes	5.84	2.71 – 12.57	< 0.001
	No	-		

RR (Prevalence Ratio) ; CI (Confidence Interval)

Our study has some limitations. First, the EPDS serves as a screening tool rather than a diagnostic one. Women who score positive still require a comprehensive clinical evaluation to confirm PPD. Without an effective referral system to mental health services, those identified as at risk may not receive adequate care. Second, the reliability of the EPDS depends on participants' ability and willingness to recognize and disclose their symptoms. Stigma surrounding mental health can lead to underreporting, which may result in an underestimation of the true prevalence of PPD in the community. Third, this study was conducted at one point in time (cross-sectional study), so the factors related to PPD in this study may not necessarily have a causal relationship.

The provided information strongly supports the following recommendations: implementing a PPD screening program at ward health stations, where mothers bring their children under one year old for weekly vaccinations; training health workers to be able to provide mental health counseling; conducting further longitudinal studies to determine the incidence of PPD and clearly identify risk factors for women in the Central Highlands region.

4. CONCLUSION

In 2023, using the EPDS scale to screen for PPD and related factors among 363 women with infants aged 4 to 48 weeks in 8 wards of Buon Ma Thuot City, the findings were as follows:

The prevalence of PPD was 12.7% (95% CI: 9.2% - 16.1%).

Univariate analysis identified several factors associated with PPD, including: single mothers, being of the Ede ethnic group, economic difficulties, frequent crying of the child at night, the child losing or not gaining weight, lack of household help, the husband's family disliking the child's gender, conflicts with the husband's family, conflicts with the husband, threats from the husband, and forced sexual activity by the husband.

Multivariate analysis further highlighted significant factors: single mothers, low maternal income, the husband's family disliking the child's gender, and conflicts with the husband.

TỶ LỆ TRẦM CẢM SAU SINH VÀ MỘT SỐ YẾU TỐ LIÊN QUAN Ở PHỤ NỮ THÀNH PHỐ BUÔN MA THUỘT, VIỆT NAM

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TÓM TẮT

Trầm cảm sau sinh (TCSS) là một vấn đề sức khỏe thường gặp, có thể gây ra những hậu quả nghiêm trọng cho cả mẹ và con. Tỷ lệ mắc TCSS và các yếu tố ảnh hưởng có sự khác biệt giữa các khu vực, song tại Tây Nguyên, vấn đề này vẫn chưa được quan tâm đúng mức. Nghiên cứu này nhằm xác định tỷ lệ TCSS và một số yếu tố liên quan ở phụ nữ tại thành phố Buôn Ma Thuột. Nghiên cứu được thực hiện theo phương pháp cắt ngang trên 363 phụ nữ có con từ 4 đến 48 tuần tuổi cư trú tại TP Buôn Ma Thuột. TCSS được đánh giá bằng thang đo Edinburgh Postnatal Depression Scale (EPDS), kết hợp khảo sát các yếu tố liên quan thông qua bộ câu hỏi bán cấu trúc. Kết quả cho thấy tại điểm cắt 13 của thang đo EPDS, tỷ lệ TCSS là 12,7% (KTC95%: 9,2% - 16,1%). Phân tích đa biến xác định các yếu tố liên quan chặt chẽ đến TCSS, bao gồm: sống một mình (PR = 2,81, p = 0,008), thu nhập thấp (PR = 2,23, p = 0,010), gia đình chồng không hài lòng với giới tính của trẻ (PR = 2,31, p < 0,045), và mâu thuẫn với chồng (PR = 5,84, p < 0,001). Những phát hiện này cho thấy TCSS là một vấn đề sức khỏe phổ biến tại TP Buôn Ma Thuột, với các yếu tố nguy cơ liên quan đến hôn nhân, kinh tế và văn hóa. Do đó, cần có các biện pháp can thiệp toàn diện nhằm giảm thiểu nguy cơ và hỗ trợ tốt hơn cho phụ nữ sau sinh.

Từ khóa: *Trầm cảm sau sinh, yếu tố liên quan, EDPS, thành phố Buôn Ma Thuột.*

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