

# Prevalence and Factors Affecting Postpartum Depression in Buddhachinaraj Phitsanulok Hospital

Punyaphorn Laohachaiaroon MD<sup>1</sup>, Pallop Pongsuthirak MD<sup>1</sup>, Boonchai Nakariyakul MD<sup>1</sup>, Tiyyarat Kayankit MD<sup>2</sup>

<sup>1</sup> Department of Obstetrics and Gynecology, Buddhachinaraj Phitsanulok Hospital, Phitsanulok, Thailand

<sup>2</sup> Department of Psychiatry, Buddhachinaraj Phitsanulok Hospital, Phitsanulok, Thailand

**Objective:** To determine the prevalence and factors affecting postpartum depression in Buddhachinaraj Phitsanulok Hospital.

**Material and Methods:** The present study was cross-sectional study conducted between October and December 2020 among 260 postpartum women who gave birth at Buddhachinaraj Phitsanulok Hospital. The Thai version of the Edinburgh Postnatal Depression Scale (EPDS) questionnaire with a cut-off of 11 points was used to measure postpartum depression.

**Results:** The prevalence of postpartum depression in the present study was 10.4%. Bivariate analysis revealed that gravidity ( $p=0.015$ ), parity ( $p=0.011$ ), and gender of the newborn ( $p=0.038$ ) were associated with postpartum depression. The multivariate analysis suggested that parous women (AOR 3.35, 95% CI 1.11 to 10.14,  $p=0.033$ ) and male newborns (AOR 2.73, 95% CI 1.13 to 6.60,  $p=0.026$ ) were significant factors affecting postpartum depression. Thai EPDS scores in the early postpartum period showed a weak correlation with scores in the 6-week postpartum period ( $r=0.361$ ,  $p<0.001$ ).

**Conclusion:** Postpartum depression is underdiagnosed, and all women should be screened for it at 6-week postpartum as part of routine postnatal care. However, screening with Thai EPDS scores in the early postpartum period may not be necessary because scores at 6-week postpartum could not be predicted from early postpartum scores.

**Keywords:** Postpartum depression; Depression; Perinatal mental illness; Edinburgh Postnatal Depression Scale (EPDS)

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Postpartum depression (PPD) is a treatable mental health problem. It is common in postpartum women<sup>(1)</sup> and affects both the mother and her baby. Onset of the symptoms could be the prenatal period to a year after childbirth, but it mostly occurs within the first month after giving birth<sup>(1-4)</sup>. Factors that could contribute to PPD are loss of self-worth or the sense of losing oneself. Women during pregnancy and after giving birth undergo physical, mental, and social changes, including changes in hormone levels. From mental and social aspects, changing roles from wife to mother and raising her child is considered

one of the most critical periods of life, which could contribute to PPD<sup>(5,6)</sup>.

PPD symptoms are similar to those of other depressive disorders, and can include feelings of sadness, boredom, exhaustion, insomnia, irritability, anxiety, various obsessive-compulsive disorder symptoms, and a lack of interest in oneself and one's surroundings after birth. Furthermore, it affects the relationship with their spouses or family and could lead to divorce. It also affects their baby in several aspects, like intelligence, physical, and emotional development. In particular, if the mother had severe depression, she would think of suicide or killing the baby<sup>(7)</sup>.

In general, severe depression and postpartum psychosis are obvious and diagnosed, but mild depression is often undetected or undiagnosed as both the patient and the caregiver overlook it due to the idea that it is a normal event or just a consequence of childbirth. Therefore, screening for PPD in all postpartum women is recommended by both the American College of Obstetricians and Gynecologists<sup>(8)</sup> and the American Academy of Pediatrics<sup>(9)</sup>, especially in the sixth week postpartum,

## Correspondence to:

Laohachaiaroon P.

Department of Obstetrics and Gynecology, Buddhachinaraj Phitsanulok Hospital, 90 Srithamtripidok Road, Muang Phitsanulok, Phitsanulok 65000, Thailand.

**Phone:** +66-55-270300

**Email:** [Punyaphorn.laoha@gmail.com](mailto:Punyaphorn.laoha@gmail.com)

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since this period is the period for symptom onset. Thus, it is the proper time for postpartum health monitoring. PPD must be differentiated from postpartum blue, which is another type of sadness that can occur in a typical postpartum woman who develops symptoms within two to five days of giving birth and resolves within two weeks. As PPD and postpartum blue have similar symptoms, it is hard to differentiate between the two at the beginning. Therefore, an evaluation in different periods could aid diagnosis<sup>(4)</sup>.

The prevalence of PPD can be varied due to differences in region, ethnicity, study method, diagnostic criteria, questionnaire, and different postpartum periods. From a literature review, the prevalence of PPD ranges from 8 to 33.82%<sup>(10-18)</sup>. Buddhachinaraj Phitsanulok Hospital, Thailand, is a large tertiary care center with 1,030 beds and an average of 3,500 to 4,000 women giving birth per year. However, there is no report of PPD prevalence due to the lack of screening for depression in postpartum women. Therefore, the purpose of the present study was to determine the prevalence of PPD, and factors related to postpartum maternal depression in women who gave birth at Buddhachinaraj Phitsanulok Hospital, Thailand.

## Materials and Methods

The present study was a cross-sectional descriptive study. It was approved by the Institutional Review Board (IRB No. 128/63) and conducted in Buddhachinaraj Phitsanulok Hospital between October and December 2020. Enrollment of Thai women who gave birth in Buddhachinaraj Phitsanulok Hospital was done. Women who had communication difficulties such as deafness, mental retardation, active psychosis, or inability to complete a questionnaire for any reason were excluded. The sample size was calculated using Cochran's formula on an assumed PPD prevalence of 17% from a previous study of worldwide PPD prevalence<sup>(10)</sup> and a 95% confidence interval, and 10% was added to the calculated number using the formula in participation of any incomplete data. The final calculated sample size was 240.

The present study aimed to determine the prevalence of PPD in Buddhachinaraj Phitsanulok Hospital. The secondary objectives were to determine factors affecting PPD and to evaluate the correlation between Thai Edinburgh Postnatal Depression Scale (EPDS) scores at early and 6-week postpartum.

All eligible participants were asked to sign the informed consent before taking part in the present study. The questionnaire consisted of three main

information, which were personal information, pregnancy and delivery information, and diagnostic of PPD using Thai edition of EPDS that was translated and validated by Vacharaporn et al<sup>(19)</sup>. All participants were asked to complete all questionnaire within 72 hours after giving birth and repeat only EPDS at 6-week postpartum.

The data were analyzed from R4.1.0 with Rstudio 1.4.1717. The prevalence of PPD was determined by 11 points or more of EPDS score<sup>(19)</sup>. Mean, standard deviation, median, frequency, and percentage were used for descriptive data. Chi-square test, Fisher's exact test, logistic regression analysis, and ANOVA test were used for inferential statistics. The correlation between EPDS scores at early and 6-week postpartum was determined by Spearman's rank correlation coefficient. A p-value of less than 0.05 was considered as statistically significant.

## Results

According to the results of the 260 eligible women, it was shown that the average age of pregnant women was 28.1 years, the youngest was 14 years old, and the oldest was 48 years old. Nine-point six percent of participants graduated from primary school, 65.4% from high school, and 25.0% higher. Eleven-point two percent of them were younger than 20 years old, 67.3% of them were 20 to 34 years old, and 21.5% of them were 35 years old or older. Most of them were Buddhist (98.1%), unemployed (29.6%), registered marriage was 37.3%, but living together was 84.2%. The proportion of the sample with a familial history of psychiatric disease was 0.8%, and 6.9% had a history of drinking or smoking. Eighty-four-point two percent reported their family income was higher than 10,000 THB or about 300 USD. Most (75.4%) of the participants reported having enough income to cover their expenses.

From the information about pregnancy and childbirth, it was found that 42.3% was the first pregnancy, 47.3% was the first child, and 17.3% had a history of miscarriage. Most of them had planned before pregnancy (55.0%), had more than five antenatal care visits (93.1%), and were ready to have a child (86.2%). The gender of the infants met the expectations in 50.0%, while 47.3% were not interested in the gender of the child. The percentage of vaginal delivery and cesarean delivery were 55.0% and 45.0%, respectively. Most of the newborns stayed with their mother (88.9%) and were at term (88.1%) (Table 1).

The Thai EPDS scores during early postpartum

**Table 1.** The socio-demographic characteristics of the study population and proportion of PPD (n=260)

Characters	Total; n (%)	PPD; n (%)		p-value
		Yes (n=27)	No (n=233)	
<b>Age</b>				
Mean, SD	28.1, 6.9			
<20 years	29 (11.2)	2 (6.9)	27 (93.1)	0.270
20 to 34 years	175 (67.3)	16 (9.1)	159 (90.9)	
35 years or more	56 (21.5)	9 (16.1)	47 (83.7)	
<b>Religion</b>				
Buddhism	255 (98.1)	27 (10.6)	228 (89.4)	>0.999 <sup>F</sup>
Others	5 (1.9)	0 (0.0)	5 (100.0)	
<b>Educational level</b>				
Primary school	25 (9.6)	1 (4.0)	24 (96.0)	0.170
High school	170 (65.4)	22 (12.9)	148 (87.1)	
Higher	65 (25.0)	4 (6.2)	61 (93.8)	
<b>Having a career</b>				
Yes	183 (70.4)	20 (10.9)	163 (89.1)	0.825
No	77 (29.6)	7 (9.1)	70 (90.9)	
<b>Gravidity</b>				
Primigravida	110 (42.3)	5 (4.5)	105 (95.5)	0.015*
Multigravida	150 (57.7)	22 (14.7)	128 (85.3)	
<b>Parity</b>				
Primipara	123 (47.3)	6 (4.9)	117 (95.1)	0.011*
Multipara	137 (52.7)	21 (15.3)	116 (84.7)	
<b>Having financial problem</b>				
Yes	64 (24.6)	10 (15.6)	54 (84.4)	0.178
No	196 (75.4)	17 (8.7)	179 (91.3)	
<b>Registered marriage</b>				
Yes	97 (37.3)	15 (15.5)	82 (84.5)	0.063
No	163 (62.7)	12 (7.4)	151 (92.6)	
<b>Living with spouse</b>				
Yes	219 (84.2)	24 (11.0)	195 (89.0)	0.589 <sup>F</sup>
No	41 (15.8)	3 (7.3)	38 (92.7)	
<b>Route of delivery</b>				
Vaginal delivery	143 (55.0)	16 (11.2)	127 (88.8)	0.790
Cesarean delivery	117 (45.0)	11 (9.4)	106 (90.6)	
<b>Gestational age</b>				
<37 weeks	31 (11.9)	3 (9.7)	28 (90.3)	>0.999 <sup>F</sup>
37 weeks or more	229 (88.1)	24 (10.5)	205 (89.5)	
<b>Sex of newborn</b>				
Male	129 (49.6)	19 (14.7)	110 (85.3)	0.038*
Female	131 (50.4)	8 (6.1)	123 (93.9)	
<b>Admission of newborn</b>				
Stay with mother	231 (88.9)	24 (10.4)	207 (89.6)	>0.999 <sup>F</sup>
Nursery	18 (6.9)	2 (11.1)	16 (88.9)	
NICU	11 (4.2)	1 (9.1)	10 (90.9)	

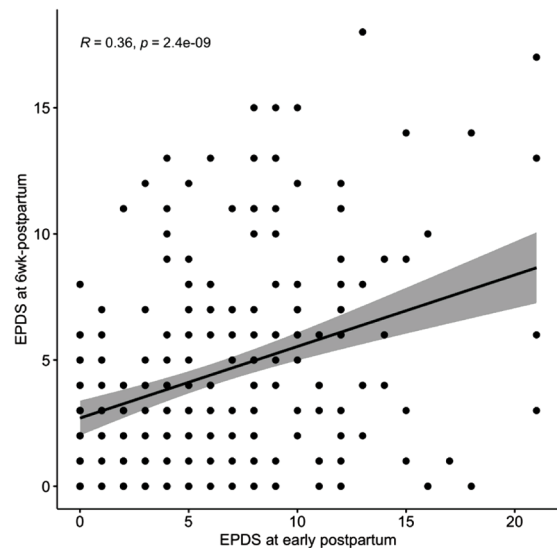
PPD=postpartum depression; NICU=neonatal intensive care unit; SD=standard deviation

\* Statistically significant at p<0.05 determined by chi-square, <sup>F</sup> Fisher's exact test

**Table 2.** Factors influencing the development of postpartum depression as classified according to the EPDS score

Factors	Adjusted odd ratio	95% confident interval	p-value
Teenage	1.00	0.93 to 1.08	0.978
Married	2.23	0.96 to 5.19	0.063
Multipara	3.35	1.11 to 10.14	0.033*
Male newborn	2.73	1.13 to 6.60	0.026*

\* Statistically significant at p<0.05 determined by logistic regression analysis



**Figure 1.** Scatter plot and linear distribution diagram shows the correlation between the EPDS scores at the early postpartum and 6-week postpartum.

ranged from 0 to 21, with a median of 5, while scores at 6-week postpartum ranged from 0 to 18, with a median of 3. The prevalence of PPD at 6-week postpartum (11 points or higher of Thai EPDS scores) was 10.4%. Factors associated with PPD were gravidity (p=0.015), parity (p=0.011), and gender of newborn (p=0.038). Gravidity, parity, adolescent status, marital status, and the gender of the newborn are all characteristics that may influence PPD, according to the preliminary investigation. As a result, these variables were included in the logistic regression test, which demonstrated that, as suggested by the multivariate analysis, parous women (adjusted odds ratio [AOR] 3.35, 95% CI 1.11 to 10.14, p=0.033) and male newborns (AOR 2.73, 95% CI 1.13 to 6.60, p=0.026) were significant factors affecting PPD (Table 1, 2).

The scatter plot for Thai EPDS scores at the early and 6-week postpartum periods and the linear distribution diagram showed a weak correlation

(Spearman's correlation coefficient ( $r$ )=0.36,  $p<0.001$ ) between Thai EPDS scores at the early and 6-week postpartum period (Figure 1).

## Discussion

In the present study aimed to investigate the prevalence of PPD and the factors associated with PPD among 260 postpartum women gave birth at Buddhachinaraj Phitsanulok Hospital, Thailand. The prevalence of PPD at the sixth week after childbirth was 10.4%, similar to the study of Pitanupong and Vacharaporn as the prevalence and factors associated with the incidence of PPD in Songkhla Nakarin Hospital, Thailand<sup>(20)</sup>. The study had shown the prevalence of PPD was 9.5% in the four to six weeks after giving birth. Moreover, the study of Chaopanitwet investigated the prevalence and factors associated with PPD in Bangkok Metropolitan Administration General Hospital, had also found the prevalence to be 10.4% during the sixth-week postpartum period<sup>(21)</sup>. Another study by Panyayong, which was a national survey of PPD among Thai women, showed the prevalence of PPD was 8.4% between sixth and eighth-week postpartum<sup>(22)</sup>. The difference of prevalence of PPD may be due to the different cut-off points of the Thai EPDS scores and different timing of the study.

The authors have found that the factors associated with PPD were gravidity, parity, and the gender of the child. The results of the multiple logistic regression analysis revealed that second pregnancies or more and male infant were the contributing factors to the incidence of major PPD ( $p=0.033$  and  $0.026$ , respectively).

The women in their second pregnancy or more had a higher risk about 3.4 times than the first pregnancy to develop PPD (AOR 3.35, 95% CI 1.11 to 10.14), which can be explained by the stress and overload in their family when they already had other children. The male infant was a 2.7 times higher risk to develop PPD than giving birth to the female infant (AOR 2.73, 95% CI 1.13 to 6.60), which was similar to the study of Sarah Myers, which found the women giving birth to a male infant was found to be 1.71 to 1.79 times associated with the incidence of PPD and women who gave birth to male newborn have more proinflammatory cytokine, which correlate with PPD<sup>(23)</sup>.

The results of the Thai EPDS scores show that the scores during the early postpartum period had a weak correlation with the scores at 6-week postpartum period. This finding might indicate that the scores at

early postpartum cannot be assumed to be the same as the scores at 6-week postpartum, so routine screening of PPD with the Thai EPDS questionnaire in early postpartum might not be necessary.

The findings of the present study indicate that the burden of mental health is underestimated by health professionals, so this information should alert healthcare workers that PPD needs to be screened in the routine postnatal care. The screening with the Thai EPDS scores at the early postpartum period might not be necessary because the scores at 6-week postpartum could not be strongly predicted from the scores in the early postpartum period. The data obtained from the present study could be applied to in-screening, diagnosis, therapy, and organizing a surveillance system for PPD in women to receive quality diagnosis and treatment.

The present research has limitations, including data collection with questionnaires, where the participants answer the questionnaires themselves. Thus, it could have high discrepancies due to questions being answered by feelings and understanding. In addition, the data collection of depression was performed using a Thai version of the EPDS, which had low sensitivity but high specificity<sup>(19)</sup>. Therefore, it is highly possible that the screening of patients with low severity of PPD was lower than reality.

In particular, it was also a cross-sectional study, and the sample numbers were calculated to determine the prevalence. Therefore, it could not be concluded that the factors associated with PPD are also the risk factors for PPD.

From such limitations, the authors suggest that interviewing patients and using DSM-V to confirm the diagnosis of PPD may be helpful. The prevalence of PPD should be investigated in a larger population and longer period for the predictions and guidelines for further prevention.

## Conclusion

PPD is underdiagnosed, and all women should be screened for it at 6-week postpartum as part of routine postnatal care. However, screening with Thai EPDS scores in the early postpartum period may not be necessary because scores at 6-week postpartum could not be predicted from early postpartum scores.

## What is already known on this topic?

Previous studies in Thailand have shown that the prevalence of PPD in Thai patients is lower than the global prevalence. There was also a significant positive correlation between Thai EPDS scores in

the early postpartum period and scores at 6-week postpartum.

### What this study adds?

The prevalence of PPD in postpartum women at Buddhachinaraj Phitsanulok Hospital was 10.4%, which is similar to the other studies in Thailand but lower than the global prevalence. There is a weak correlation between Thai EPDS scores at early postpartum and 6-week postpartum with a Spearman's correlation coefficient of 0.36. Routine screening of PPD in early postpartum might not be necessary.

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### Conflicts of interest

The authors declare no conflict of interest.

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