Original Article

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Concordance of the Thai versions of the Patient Health Questionnaire and Edinburgh Post-natal Depression Scale for antenatal depression

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Abstract:

Objective: To compare the Thai versions of the Patient Health Questionnaire (PHQ-9) and the Edinburgh Postnatal Depression Scale (EPDS) and examine the associated factors with the degree of concordance for assessing depression in pregnant Thai women.

Material and Methods: This was a cross-sectional study conducted in November-December 2022. The Thai versions of both the PHQ-9 and EPDS were completed by pregnant women at the Antenatal Care Clinic, Songklanagarind Hospital, Thailand. Descriptive data analysis and multivariate logistic regression were performed using The R Program to categorize "normal" and "increased risk of antenatal depression" and examine the statistical agreement, associated factors, and concordance between the two tools.

Results: Of the 135 pregnant Thai women enrolled in the study, most lived in non-restive areas of southern Thailand (80.7%) with a mean age of 31.7 years. Most participants were found "normal" for antenatal depression screening by the Thai versions of both the PHQ-9 and the EPDS (89.6% and 88.9%, respectively). Complete concordance between the PHQ-9 and EPDS tests was found in 122 of the women, with 84.4% of all women found 'normal' and 5.9% found to have "increased risk of antenatal depression" with both questionnaires. The overall agreement between the 2 questionnaires was statistically significant (Kappa=0.4979, p-value<0.0001, Z=5.79). The statistical analysis identified no demographic factors associated with the concordance.

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Conclusion: The Thai versions of the PHQ-9 and the EPDS for antenatal depression screening had significantly moderate agreement. The statistical analysis found no factors associated with the concordance.

Keywords: antenatal screening, depression, Edinburgh Postnatal Depression Scale, Patient Health Questionnaire

Introduction

The World Health Organization (WHO) stated that depression was the second leading cause of burden of disease in 2020, and it will be the global leading cause of "lost years of healthy life" in 2030[1]. Women are at higher risk of developing depression during pregnancy because of hormonal changes and/or certain pregnancy-related physical and psychological conditions[2]. Antepartum depression has been associated with unfavorable pregnancy outcomes such as preterm birth or low birth weight, and a higher risk of postpartum depression[2]. The prevalence of antepartum depression has been found to be higher in low-to-middle income countries, such as Thailand[3]. In 2019-2021, the prevalence of depression among pregnant Thai women was found to be 10.6%-18.9%[4,5].

Many psychometric tools for assessing depression have been translated into the Thai language, with well-constructed validation studies and good internal consistency in both clinical and research settings, for example, the Center for Epidemiological Studies Depression Scale (CES-D)[6] and the Patient Health Questionnaire (PHQ-9)[7]. The PHQ-9 is a 9-item self-reporting questionnaire, based on the criteria of "major depressive disorder" from the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV-TR) of the American Psychiatric Association[7,8]. This tool has been commonly used to screen for depression worldwide and has been translated into more than 70 languages, including the Thai language in 2008[7,8]. The Thai version of the PHQ-9 has shown excellent psychometric properties in both the general and many specific populations, such as various-aged groups of healthcare workers and patients with post-stroke depression[9,10]. To date, the Thai PHQ-9 has been the most common screening tool for depression in both clinical and non-clinical settings in Thailand[7-10]. Although antenatal and postpartum depression studies of the PHQ-9 have shown good internal consistency, specificity, sensitivity and user-friendliness around the world[11,12], a study has been critiqued some of the PHQ-9 items[for over-focus on physical symptoms which could be misinterpreted by physical changes natural in pregnancy[13]. To date, there have been no studies on internal consistency and validation of the PHQ-9 when used for antepartum depression screening in Thailand.

The Edinburgh Postnatal Depression Scale (EPDS) is a 10-item self-assessment tool for post-partum depression, with good accuracy for depressive symptoms in post-natal Thai women[14]. The Thai version of the EPDS has also been found to have good psychometric analysis properties for both perinatal and antenatal depression assessment[15,16]. The questionnaire has been a standard screening tool for both antepartum and postpartum depression for over 10 years, recommended by the Thai Ministry of Public Health[17]. However, to date there have been no studies which have evaluated the accuracy of the EPDS in non-pregnant Thai women, or older women, to evaluate depression throughout the life span. And other studies have suggested that the EPDS is an over-sensitive measure for symptoms across psychiatric treatments in evaluating pregnant women[18,19].

The main objective of this study was to compare the Thai versions of the PHQ-9 and EPDS in assessing antenatal depression, and factors associated with the concordance between the two tools. We wanted to conduct

a first-level assessment to determine if the Thai version of the PHQ-9 could be an alternative instrument to the standard EPDS for assessing depression among pregnant women in Thailand, because some limitations of the standard EPDS have been reported with its use in antenatal screening, for example, assessing pregnant women with prior depression and/or suicidal attempts[18,19].

Material and Methods

This study was part of a larger 3-country study on perinatal depression, under an ASEAN-India research training fellowship of the Department of Science and Technology, Government of India (RTF/2021/00181), and some of the data in this research may have been reported in other articles.

The sample size was calculated based on the prevalence of perinatal depression in the three countries enrolled in this project, India, Indonesia, and Thailand. The sample size calculation indicated that 123 pregnant women were required for each arm of the study, and to allow for a 10% incomplete data rate 135 pregnant women were enrolled from each country, including Thailand (prevalence of perinatal depression in low-and-middle-income countries =20%[20], confidence interval=95%, error=5%)[21].

After ethical approval was obtained from the Faculty of Medicine, Prince of Songkla University (PSU) (REC: 65-441-3-1), the cross-sectional-design study was conducted at Songklanagarind Hospital (PSU Hospital). Every participant was a pregnant woman, 18 years or older, who came to the antenatal clinic with written consent for research in humans. Patients with a clinically diagnosed mental disorder or who were mentally retarded were excluded. The data were collected from 1 November 2022-31 December 2022. All pregnant women attending the antenatal care clinic during the study period were invited into the study until the required sample size was reached.

All participants answered both self-assessment questionnaires of the study on perinatal depression without providing any personal identifying information. Following our initial on-site review of the questionnaires, the women would immediately be informed of the results of the depression screening, and if they had a PHQ-9 or EPDS score greater than or equal to 9 or 10, respectively, which are positive for depression screening, an appointment with a psychiatrist on the research team was recommended fr an in-depth interview and proper management. If they declined an appointment at the psychiatric outpatient clinic, the researcher recommended the "1323" mental health hotline of the Department of Mental Health, Thailand Ministry of Public Health.

Measurements

According to the objectives of this study, the documents given to each participant were questionnaires included a demographic data form and the Thai versions of the PHQ-9 and EPDS.

1. The demographic and clinical data questionnaire included the participant's age, age at marriage, domicile, occupation, religion, household income, pregnancy risks, parity, and expectations on fetal gender.

2. The Thai-version PHQ-9 consisted of nine 4-point Likert scale questions. A score of 9 was used as the cutoff for suggesting an increased risk of antenatal depression, as suggested in a prior study from other countries[19], which an earlier study of the general Thai population found to have specificity and sensitivity values of 84% and 71%, respectively[7].

3. The Thai version of the EPDS consists of ten 3-point Likert scale questions, for which a score of 10 was suggested as the cutoff point for further antepartum depression assessment in an earlier study[14]. A review and meta-analysis of the EPDS reported specificity and sensitivity values of 84% and 85%, respectively[15].

Data analysis

All data analysis was done with the R Program using descriptive analysis, the chi-square test, Fisher's exact test, and multivariate logistic regression. To compare the Thai versions of the PHQ-9 and EPDS, all total scores were classified as "normal" or "increased risk of antenatal depression". Concordance of the two instruments was defined as both scores of the same woman being either "normal" or "increased risk of antenatal depression" by the cut-off points. Using Cohen's kappa, the total PHQ-9 and EPDS scores were evaluated for statistical agreement. A p-value of <0.05 was used to indicate statistical significance for the analysis.

Results

Sociodemographic and pregnancy-related data

Of the 135 study women who used the antenatal care clinic at PSU Hospital during the study period, most were Buddhist (60.0%) and employed (86.7%). Of the ANC attendees in the study, most were there for supervision of a high-risk pregnancy (53.3%). The mean age (S.D.) was 31.8 (4.7) years, with a mean age of marriage (S.D.) of 26.8 (4.7) years. 61.5% were from families with a monthly income of 10,000-30,000 Baht (approximately 350-1,000 US$). Their hometowns were mostly in the southern region of Thailand (98.8%), and 17.0% lived in the armed conflict areas of southern Thailand. 38.5% were expecting their first child, and most participants did not prefer a specific gender for the child (52.6%) (Table 1).

Antenatal depression screening by the Thai versions of the PHQ-9 and EPDS

With the Thai version of the PHQ-9, the mean (S.D.) total score was 4.6 (3.0) with the scores ranging from 0-13. The prevalence of antenatal depression among the women whose score of >9 indicated an "increased risk of antepartum depression" was 10.4%, while a further 37.0% were recommended for "re-evaluation" for depressive symptoms, if possible (scores in the range of 5-9)[7]. Only 6.7% of the patients showed a significantly increased risk of depression by the questionnaire guideline (PHQ-9 score >10)[7] (Figure 1, Table 1).

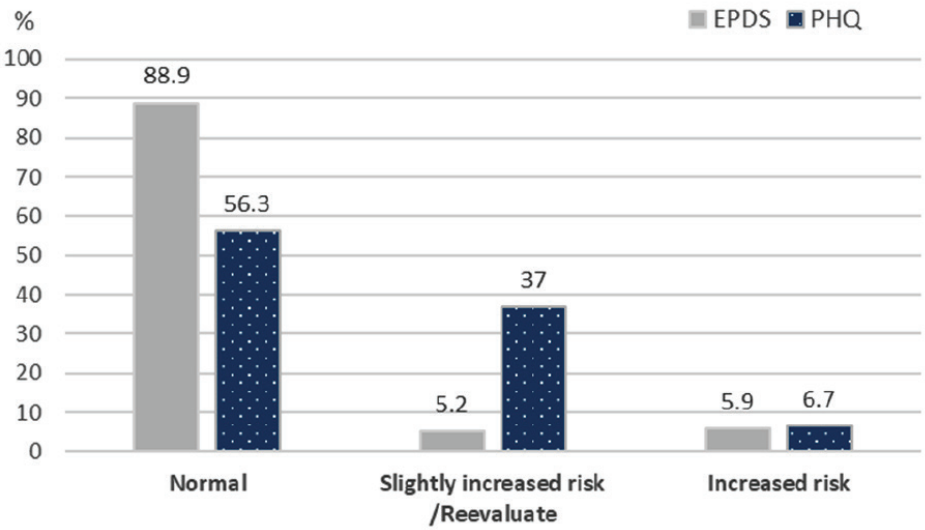
Table 1 Demographic and clinical data of the study women (n=135)

Variable	Number (%)
Age (year)	
Mean (S.D.)	31.8 (4.7)
Age at marriage (year)	
Mean (S.D.)	26.8 (4.7)
Domicile	
Non-restive area of southern Thailand	109 (80.7)
Restive area of southern Thailand	23 (17.0)
Other region of Thailand	3 (2.2)
Employment	
Unemployed	18 (13.3)
Employed	117 (86.7)
Income per month (Baht)	
No income to 10,000	37 (27.4)
10,001-30,000	83 (61.5)
30,001 or more	15 (11.1)
Religion	
Buddhist	81 (60.0)
Muslim	51 (37.8)
Other	3 (2.2)

Table 1 (continued)

Variable	Number (%)
Pregnancy risk	
High risk	72 (53.3)
Low risk	63 (46.7)
Parity	
Primiparous	52 (38.5)
Multiparous	83 (61.5)
Expectation on fetal gender	
Male	33 (24.4)
Female	31 (23.0)
No expectation	71 (52.6)
PHQ-9 screening: mean (S.D.), min-max	
Normal (score <9)	4.5 (3.0), 0-13 (89.6)
Increased risk of antenatal depression (score >9)	14 (10.4)
EPDS screening: mean (S.D.), min-max	4.3 (3.8), 0-15
Normal (score <10)	120 (88.9)
Increased risk of antenatal depression (score >10)	15 (11.1)

S.D.=standard deviation, PHQ=Patient Health Questionnaire, EPDS=Edinburgh Postnatal Depression Scale



EPDS=Edinburgh Postnatal Depression Scale, PHQ=Patient Health Questionnaire

Figure 1 Antepartum depression as assessed by the Thai versions of the PHQ-9 and EPDS categorized into three groups

Using the Thai version of the EPDS with a cut-off of 10 points, the mean (S.D.) total score was 4.3 (3.8) with a range of 0-15, and 11.1% of the participants were found to be at "increased risk of antepartum depression" (Table 1). 5.2% of the women had a slightly increased risk of depression (score of 10-11), whilst 5.9% had a significantly heightened risk of depression (EPDS score >12) (Figure 1).

Concordance of the Thai versions of the PHQ-9 and EPDS and the factors associated with concordance between the PHQ-9 and EPDS

Categorizing the participants who completed the Thai-version PHQ-9 and EPDS tests into two groups, low and high risk for antenatal depression (cut off points at scores >9 and >10 respectively), 122 pregnant women had general agreement of the Thai-version PHQ-9 and EPDS (90.4%), with 94.2% of the concordant group classified as "normal" or at low risk of antenatal depression. 9.6% of all participants showed discordant scores, with 53% of the discordant group having a PHQ-9 score <9, and an EPDS score >10 (Table 2).

The Thai versions of the PHQ-9 and EPDS were concordant by statistical analysis (Z=5.79, p-value<0.001) The agreement of these two psychometric instruments for antenatal depression was moderate (Kappa 0.4979)

Regarding identifying the factors associated with the concordance between the Thai versions of the PHQ-9 and EPDS, all demographic characteristics and all screening outcomes were included in the univariate analysis, and those with a p-value less than 0.2 were included in the multivariate logistic regression analysis. The clinical and demographic factors entered into the univariate analysis were age, age at marriage, religion, occupation, domicile, risk of pregnancy complications and parity. However, the univariate analysis showed no factors associated with the concordance between the Thai versions of the PHQ-9 and EPDS in terms of assessing antepartum depression in Thailand (p-value>0.2). Thus, no multivariate analysis was employed (Table 3).

Discussion

This study is the first study directly aimed at evaluating the feasibility of using the Thai version of the PHQ-9 for assessing antepartum depression by comparing it with the Thai version of the EPDS, the standard screening tool used for this purpose in Thailand. Although this study was not designed to assess the overall prevalence of antenatal depression in Thailand, the prevalences suggested by the Thai PHQ-9 and EPDS in an earlier study were 10.4% and 11.1%, respectively, which were similar to the prevalence of antepartum depression screening found in the same setting in 2021 (10.6%)[4].

Table 2 Antepartum depression screening results by the Thai versions of the EPDS and PHQ-9 (n=135)

EPDS score	PHQ-9 score	
	Normal (<9)	Increased risk of antenatal depression (>9)
Normal (<10)	114 (94.2)	6 (42.9)
Increased risk of antenatal depression (>10)	7 (5.8)	8 (57.1)

*Cohen's kappa=0.4979 (Z=5.79, p-value<0.0001)

EPDS=Edinburgh Postnatal Depression Scale, PHQ=Patient Health Questionnaire

Table 3 Association of demographic and clinical factors with the degree of concordance between PHQ-9 and EPDS

Variable	Inconcordance n=13	Concordance n=122	t-test p-value
Age (years)			0.389
Mean (S.D.)	30.8 (3.3)	32 (4.8)	
Age at marriage (years)			0.996
Mean (S.D.)	26.8 (3.0)	26.8 (4.8)	
Domicile			1[a]
Non-restive area of southern Thailand	11 (84.6)	98 (80.3)	
Restive area of southern Thailand	2 (15.4)	21 (17.2)	
Other region of Thailand	0	3 (2.5)	
Employment			1[a]
Unemployed	1 (7.7)	17 (13.9)	
Employed	12 (92.3)	105 (86.1)	
Income (Baht)			0.622[a]
No income to 10,000	2 (15.4)	35 (28.7)	
10,001 to 30,000	10 (76.9)	73 (59.8)	
30,001 or more	1 (7.7)	14 (11.5)	
Religion			0.301[a]
Buddhist	12 (92.3)	95 (77.9)	
Muslim	1 (7.7)	27 (22.1)	
Pregnancy Risk			0.402
High risk	5 (38.5)	67 (54.9)	
Low risk	8 (61.5)	55 (45.1)	
Parity			0.761
Primiparous	4 (30.8)	48 (39.3)	
Multiparous	9 (69.2)	74 (60.7)	
Expectation on fetal gender			0.804[a]
Male	4 (30.8)	29 (23.8)	
Female	2 (15.4)	29 (23.8)	
No expectation	7 (53.8)	64 (52.5)	

[a]Fisher's exact test: there were missing values for some variables

Regarding the optimum cut-off points of the PHQ-9 and EPDS, collective data analysis suggested the optimum cut-off point of the PHQ-9 was a score of 10 for further screening for depression in women during their antenatal period and 1 year after giving birth (sensitivity 0.81 and specificity 0.89)[19]. A recent meta-nalysis of the EPDS in screening for perinatal depression suggested a cut-off score of 11-13[15]. However, other studies of depression in pregnant women have recommended an optimum cut-off point of a score of 10 for the EPDS for early detection[14,15]. Even with no studies on the psychometric properties in pregnant Thai women specifically of the Thai-version EPDS, the cut-off score of 11 has been generally accepted as the cut-off score for post-partum depression[21]. A previous and the largest study of the psychometric properties of the Thai-version PHQ-9 in Thailand suggested a cut-off score of 9 for the general population and primary care use[7]. Another prior study reported a statistically significantly strong concordance (90.4%) but only moderate agreement between the PHQ-9 and EPDS scores, as we found in this study[22]. This suggests that there may be a difference in diagnostic accuracy between the Thai-versions of PHQ-9 and EPDS, and some specific associated factor or factors. Therefore, the Thai version of the PHQ-9 may be an

alternative screening instrument for antepartum depression in Thailand, but more studies are required in pregnant Thai women to confirm its diagnostic accuracy.

Currently, we have encouraged the use of either the Thai-version PHQ-9 or EPDS at any level of the clinical setting to assess depression among every pregnant Thai woman for early detection of depression and appropriate intervention[12].

Clinical implications

The Thai version of the PHQ-9 showed a significantly strong concordance, but moderate agreement, with the Thai version of the EPDS. And other studies have reported that the Thai version of the EPDS demonstrated excellent psychometric properties for assessing both antepartum and postpartum depression in Thailand. However, the Thai version of the PHQ-9 has also shown excellent results in terms of depression screening in general populations and various age- and gender-specific groups worldwide, while the EPDS has had no studies on its validity in other groups of Thai women. According to the concept of mental health awareness through the lifespan, the Thai version of the PHQ-9 may be an option for long-term or life-long screening in cases at increased risk of depression, such as pregnant teenagers, patients with a history of mental disorders, or those who have attempted suicide[22,23]. However, according to currently available evidence, we believe that the standard Thai-version EPDS is still the instrument of choice for assessing antepartum depression.

Limitations and suggestion

Certain limitations of this study must be recognized. First, the research was conducted at a university hospital, so most of the pregnant women who were enrolled into the project were high-risk pregnancies and lived in the southern part of Thailand, because PSU Hospital is a supra-tertiary hospital and the major referral center in southern Thailand. Thus, the findings must be carefully interpreted. Further studies should be multi-center studies or include participants from multiple regions to represent the conditions of pregnant women in the whole country. To confirm our findings regarding the Thai version of the PHQ-9 for screening for antepartum depression in Thai women, there should be studies on the validity of the instrument, in specific groups of pregnant women, and further studies on the Thai version of the EPDS in other groups of women for life-long assessment of depression. The additional studies should examine the validity of the instruments, analyze the individual items, and compare the assessments with interviews by psychiatrists, as the gold standard to identify antepartum depression.

Conclusion

The concordance of the Thai versions of the PHQ-9 and the EPDS for assessing antenatal depression was strong. However, the statistical agreement between the two psychometric instruments had moderate significance. Age, age at marriage, domicile, occupation, religion, household income, risk of pregnancy complication, parity, and expectations on fetal gender were not significantly associated with the concordance between the two psychometric instruments.

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Conflict of interest

None

References

1. World Health Organization. Depression: let's talk [homepage on the Internet]. Geneva: WHO; 2019 [cited 2023 Feb 23]. Available from: https://www.who.int/mental health/management/depression/en/
2. Dadi AF, Miller ER, Bisetegn TA, Mwanri L. Global burden of antenatal depression and its association with adverse birth outcomes: an umbrella review. BMC Public Health 2020;20:173.
3. Gelaye B, Rondon MB, Araya R, Williams MA. Epidemiology of maternal depression, risk factors, and child outcomes in low-income and middle-income countries. Lancet Psychiatry 2016;3:973-82.
4. Choosuk P, Pitanupong J, Suwanrath C. Prevalence and factors associated with antepartum depression: a university hospital-based. Siriraj Med J 2021;73:652–60.
5. Tuksanawes P, Kaewkiattikun K, Kerdcharoen N. Prevalence and associated factors of antenatal depressive symptoms in pregnant women living in an Urban area of Thailand. Int J Womens Health 2020;12:849-58.
6. Ross R, Sawatphanit W, Zeller R. Depressive symptoms among HIV-positive pregnant women in Thailand. J Nurs Scholarsh 2009;41:344-50.
7. Lotrakul M, Sumrithe S, Saipanish R. Reliability and validity of the Thai version of the PHQ-9. BMC Psychiatry 2008;8:46.
8. Carroll HA, Hook K, Perez OFR, Denckla C, Vince CC, Ghebrehiwet S, et al. Establishing reliability and validity for mental health screening instruments in resource-constrained settings: systematic review of the PHQ-9 and key recommendations. Psychiatry Res 2020;291:113236.
9. Murray AL, Hemady CL, Do H, Dunne M, Foley S, Osafo J, et al. Measuring antenatal depressive symptoms across the world: a validation and cross-country invariance analysis of the Patient Health Questionnaire-9 (PHQ-9) in eight diverse low-resource settings. Psychol Assess 2022;34:993-1007.
10. Dajpratham P, Pukrittayakamee P, Atsariyasing W, Wannarit K, Boonhong J, Pongpirul K. The validity and reliability of the PHQ-9 in screening for post-stroke depression. BMC Psychiatry 2020;20:291.
11. Flanagan T, Avalos LA. Perinatal obstetric office depression screening and treatment. Obstet Gynecol 2016;127:911–5.
12. Ransing R, Deshpande SN, Shete SR, Patil I, Kukreti P, Raghuveer P, et al. Assessing antenatal depression in primary care with the PHQ-2 and PHQ-9: can it be carried out by auxiliary nurse midwife (ANM)? Asian J Psychiatr 2020;53: 102109.
13. Zhong Q, Gelaye B, Rondon M, Sanchez SE, Garcia PJ, Sanchez E, et al. Comparative performance of Patient Health Questionnaire-9 and Edinburgh Postnatal Depression Scale for screening antepartum depression. J Affect Disord 2014;162:1-7.
14. Santos IS, Matijasevich A, Tavares BF, da Cruz Lima AC, Riegel RE, Lopes BC. Comparing validity of Edinburgh scale and SRQ20 in screening for post-partum depression. Clin Pract Epidemiol Ment Health 2007;3:18.
15. Levis B, Negeri Z, Sun Y, Benedetti A, Thombs BD, Group DESDE. Accuracy of the Edinburgh Postnatal Depression Scale (EPDS) for screening to detect major depression among pregnant and postpartum women: systematic review and meta-analysis of individual participant data. BMJ 2020;371:m4022.
16. Roomruangwong C, Withayavanitchai S, Maes M. Antenatal and postnatal risk factors of postpartum depression symptoms in Thai women: a case-control study. Sex Reprod Healthc 2016;10:25-31.
17. Boobpamala S, Netimetee S, Jindapaisan S. Depression prevention in pregnant adolescents. Thai J Nurs 2022;71:63–72.
18. Mao F, Sun Y, Wang J, Huang Y, Lu Y, Cao F. Sensitivity to change and minimal clinically important difference of Edinburgh postnatal depression scale. Asian J Psychiatr 2021;66:102873.
19. Wang L, Kroenke K, Stump TE, Monahan PO. Screening for perinatal depression with the Patient Health Questionnaire depression scale (PHQ-9): a systematic review and meta-analysis. Gen Hosp Psychiatry 2021;68:74-82.
20. Bluett-Duncan M, Kishore MT, Patil DM, Satyanarayana VA,

Sharp H. A systematic review of the association between perinatal depression and cognitive development in infancy in low and middle-income countries. PLoS One 2021;16:e0253790.

21. Limlomwongse N, Liabsuetrakul T. Cohort study of depressive moods in Thai women during late pregnancy and 6-8 weeks of postpartum using the Edinburgh Postnatal Depression Scale (EPDS). Arch Womens Ment Health 2006;9:131-8.
22. Yawn BP, Pace W, Wollan PC, Bertram S, Kurland M, Graham D, et al. Concordance of Edinburgh Postnatal Depression Scale (EPDS) and Patient Health Questionnaire (PHQ-9) to assess increased risk of depression among postpartum women. J Am Board Fam Med 2009;22:483-91.
23. Uthaipaisanwong A, Rungruxsirivorn T, Roomruangwong C, Taechakraichana N, Chaithongwongwatthana S. Associated factors of prenatal depression among teenage pregnant women at King Chulalongkorn Memorial Hospital. J Med Assoc Thai 2015;98:437–43.