

Development of Postpartum Depression Screening Scale (PDSS): A Thai Version for Screening Postpartum Depression

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To validate a Postpartum Depression Screening Scale (PDSS) for screening postpartum depressive disorder in Songkhla Thai population, a screening test was conducted. A Thai version of the PDSS was developed using back translation and pre-tested on a prospective cohort of 400 postpartum women at 6-8 weeks from November 2003 to September 2004 in a university hospital, Southern Thailand. The diagnosis of postpartum depression was determined using DSM-IV diagnostic criteria for minor and major depressive disorders. The alpha reliability for the total PDSS was 0.9. The recommended cut-off scores of 51 for screening major or minor depressive disorders and of 90 for screening major depressive disorder. Area under the receiver operating characteristics (ROC) curve was 0.8 for major and minor depressive disorders and 0.9 for major depressive disorder. In conclusion, this is a useful and beneficial instrument as there is no other Thai version validated instrument for postpartum depression.

Keywords: Postpartum depression screening scale, PDSS, Postpartum depression, Screening, Songkhla Thai population

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Depression is one of the most common psychiatric illnesses and a major medical disability throughout the world. It has considerable effects on personal and family life and emotional impairment according to the World Health Organization. Its symptoms result in mood disorders, which affect not only the women's own lives but also mother-baby interaction and social relationships⁽¹⁾. The prevalence or incidence of postpartum depression is around 10-30%, varying by countries depending on diagnostic criteria, selected instruments, risk factors of different populations groups, and timing of detection⁽²⁻⁶⁾. The most common diagnostic criteria of depressive disorder is based on the American Psychiatric Association's Diagnostic and Statistical Manual for Mental

Disorders-Fourth Edition (DSM-IV 1994). Using the DSM-IV requires psychiatrists or trained professionals, clinical interviews, and time to clarify the depressive symptoms. Depressive disorders are classified as minor or major depending on the severity of the depressed mood⁽⁷⁾.

The use of self-reported and accurate screening instruments is essential for early detection and treatment of this illness. Beck, et al⁽⁸⁾ developed a psychometric test they called the Postpartum Depression Screening Scale (PDSS) which has 7 categories (sleeping/eating disturbances, anxiety/insecurity, emotional lability, mental confusion, loss of self, guilt/shame, and suicidal thoughts). Each category contained 5 items and their reliability varied from 0.83 (sleeping/eating disturbances and anxiety/insecurity) to 0.94 (loss of self). Scales of each item use a Likert rating scale which ranges from 1 (strongly disagree) to 5 (strongly agree)⁽⁸⁾. The PDSS describes the symptoms the subject felt over the previous 2 weeks. The original English

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version of this test showed high sensitivity (94% for major depressive disorder and 91% for major and minor depressive disorders) and specificity (98% for major depressive disorder and 72% for major and minor depressive disorders), which were higher than the already existing Edinburgh Postnatal Depression Scale (EPDS) and Beck Depression Inventory-II (BDI-II)⁽⁵⁾. The items of the PDSS are specific for women after childbirth^(5,8,9). It was translated into Spanish, and in this version its reliability and validity psychometrics were slightly lower, but still within an acceptable range when compared to the original English PDSS⁽¹⁰⁾.

However, Beck suggested that researchers who plan to use the PDSS need to construct a Receiving Operating Characteristic (ROC) curve based on characteristics of their various samples to determine the cut-off points in their studies. There are no specific screening instruments for postpartum depressive disorder currently being used in Thailand to determine the magnitude of postpartum women at risk and the need for early diagnosis. Therefore, the present study aimed to develop and validate a Thai PDSS for screening postpartum depressive disorder in Thai cultures and population.

Material and Method

Instrument

Translation

A translation of the original English version of PDSS into a Thai version was followed by a back translation. A bilingual translator translated the original English version into Thai and an other translator blindly translated the Thai version back into English. The two English versions were checked for discrepancies which were discussed among the translators and researchers, as recommended by Beck⁽¹¹⁾. During the process of translation, it was noted that statements such as "I felt like I was jumping out of my skin" and "I felt really overwhelmed" were difficult to translate accurately into Thai and needed to be changed or modified. Final modifications were finally agreed on and a consensus was reached.

Pre-testing

After the completion of the back translation, the Thai version was reviewed by a Thai language teacher for wording and understanding, and a few small modifications of the wording were made. The original and Thai versions of the PDSS were assessed independently with a sample of 10 postpartum women who understood the English language, and no significant

differences of responses for each item in the two languages were found by either Paired t test or Wilcoxon Sign Rank test as appropriate. The statements of "I felt like I was jumping out of my skin" and "I felt really overwhelmed" in the original version still created translation difficulties among the pre-test samples and needed explanation from the researcher. There were no additional qualitative changes to the Thai version indicated from these samples, thus it became the final Thai version.

Subjects and setting

The subjects were 6-8 week postpartum women who had antenatal care and delivered at a university hospital in Southern Thailand from November 2003 to September 2004. Women having a language problem or currently diagnosed with and receiving treatment for a psychiatric disorder were excluded.

Procedures

Pregnant women of a gestational age of 36-40 weeks who were willing to participate in the study signed the consent form. Baseline characteristics (age, religious status, income, academic degree and occupation) were obtained. Their delivery dates were checked regularly and an appointment was made at 6-8 weeks postpartum to complete the Thai PDSS by a research assistant, then for an interview by 2 standardized psychiatrists who did not know the PDSS scores or baseline characteristics. The gold standard for diagnosis is the clinical interview using DSM-IV criteria. The two settings of depressive disorders in the present study were defined as 1) both minor and major depressive disorders [normal (= 0)/minor or major (= 1)] and 2) major depressive disorder only [normal and minor (= 0)/major (=1)]⁽⁷⁾. Postpartum women found to have depressive disorders were treated and followed up by a psychiatrist.

Statistics

Preliminary analysis

A total of 165 postpartum women in the first 3-month period of the present study were analyzed to recalculate the sample size based on the sensitivity and specificity of the study setting. The incidence of postpartum depression, including minor and major depressive disorders diagnosed by DSM-IV, was 9.7% (8.5% for minor depressive disorder and 1.2% for major depressive disorder). According to the sensitivity of 69% and specificity of 76%, with an acceptable error of 15% and level of confidence at 95%, at least 37

postpartum women with depressive disorders must be included thus at least 382 postpartum women were needed.

Study analysis

Data were recorded in EpiData and analyzed by Stata 7.02 (Stata Corporation, Texas, USA). The internal consistency for the total PDSS and each category (sleeping/eating disturbances, anxiety/insecurity, emotional lability, mental confusion, loss of self, guilt/shame, and suicidal thoughts) was analyzed by Cronbach's alpha. The appropriate cut-off score was determined by ROC curve with sensitivity, specificity, and positive and negative predictive values for screening minor and major depressive disorders versus major depressive disorders.

Ethics

The study protocol was approved by the Institutional Ethics Committee of the Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkhla, Thailand. Western Psychological Services (WPS) Rights and Permissions approved the translation copyright.

Results

Four hundred women during the postpartum period 6-8 weeks came to complete the Thai PDSS and have an interview. The age of the women ranged from 15 to 43 years (mean \pm SD = 27.9 \pm 5.9); 89% were Buddhists and 10% Muslim. Two thirds of the women had a family income less than 10,000 Baht/month. Forty percent of participants graduated from secondary school.

Among 400 postpartum women, 360 (90%) were psychologically normal and 40 (10%, 95% confidence interval 7-13%) were diagnosed with depressive disorders indicating 36 as minor depressive disorders (9%) and 4 as major depressive disorders (1%) according to DSM-IV criteria. All women with depressive disorders were diagnosed and treated by a psychiatrist.

Total PDSS scores ranged from 35 to 153 with a median of 43. The median scores of sleeping/eating disturbances, anxiety/insecurity, emotional lability, mental confusion, loss of self, guilt/shame, and suicidal thoughts were 6, 7, 7, 6, 5, 5 and 5, respectively. The Cronbach's alpha for the total PDSS was 0.9 and for the 7 categories ranged from 0.7 to 0.8. The scores of each category correlated between 0.6 and 0.9 with the PDSS total score. The score of suicidal thoughts showed the lowest correlation.

The performance of the PDSS over the range of cut-off scores using DSM-IV major or minor and major only depressive disorder criteria is shown in Table 1. Using a PDSS sum score of 51 as a cut-off, postpartum depression with major or minor depressive disorders were detected with a sensitivity of 72%, specificity of 79%, positive predictive value of 28% and negative predictive value of 96%. At this cut-off score, 28% of depressed postpartum women were missed and 21% of non-depressed women were false positive. A positive screening test (sum score greater than 51) is about 3.5 times more likely to be made in the diagnosis of minor or major depressive disorders at postpartum than normal postpartum women (the likelihood ratio for positive test = 3.5) and the likelihood ratio of the negative test (1-sensitivity/specificity) was 0.3.

For postpartum depression with major depressive disorder only, using a PDSS sum cut-off score of 90, the sensitivity was 75%, specificity was 99%, positive predictive value was 43% and negative predictive value was 100%. At this cut-off score, 25% of depressed postpartum women were missed and only 1% of non-depressed women falsely screened positive. A positive screening test (sum score greater than 90) was about 74.3 times more likely to be made in the diagnosis of major depressive disorders than in normal postpartum women, or with a minor depressive disorder (the likelihood ratio for positive test = 74.3). The likelihood ratio of the negative test was 0.2. When the cut-off score was reduced to 48, no depressed women were missed but the normal women identified as diseased increased to 32%. Sensitivity dropped from 100% to 75% when the cut-off score was changed from 48 to 49. The area under the curve (AUC) of the ROC curve was 0.80 (95% confidence interval 0.72-0.88) for major and minor depressive disorders and 0.92 (95% confidence interval 0.77-1.00) for major depressive disorders as shown in Fig. 1 and 2, respectively.

Discussion

A Thai version of the PDSS developed fills a gap of lacking the specific screening instruments for postpartum depression. This Thai version of the PDSS was constructed by back translation and compared with the original version by pre-testing, and the internal consistencies and the correlation of the total scores overall and in each category were good. This instrument is easily self-administered, and is the first such Thai instrument which is acceptably sensitive and specific for the identification of postpartum women at

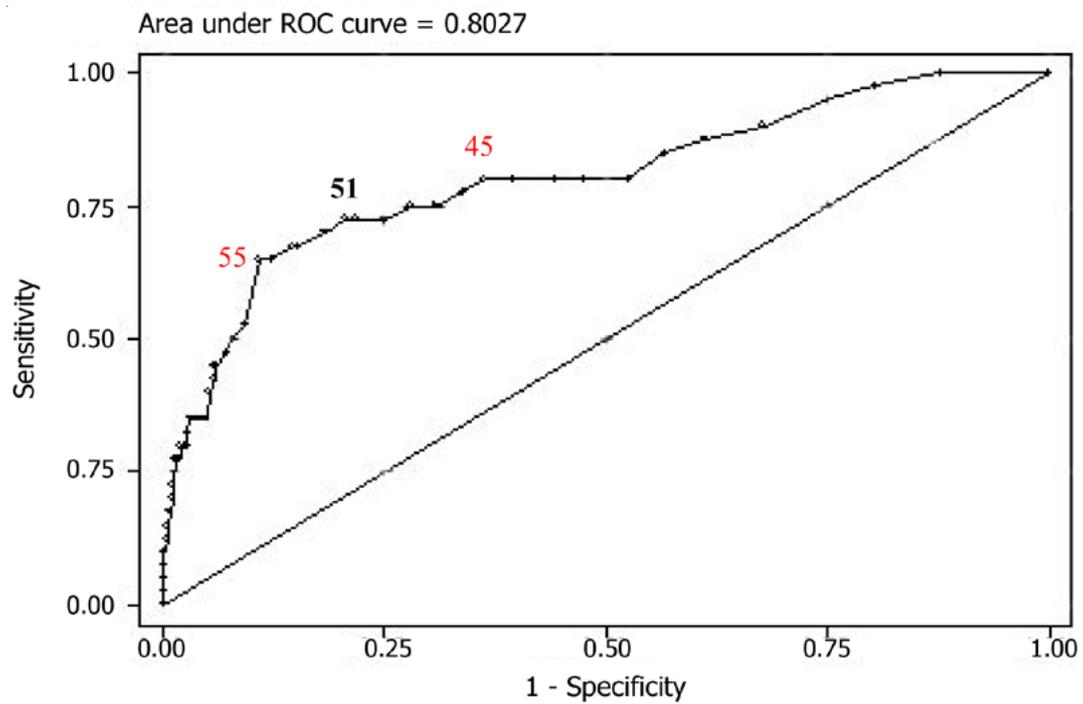


Fig. 1 Receiver operating characteristics (ROC) curve for the Thai version of the Postpartum Depression Screening Scale (PDSS) in detecting major and minor depressive disorders

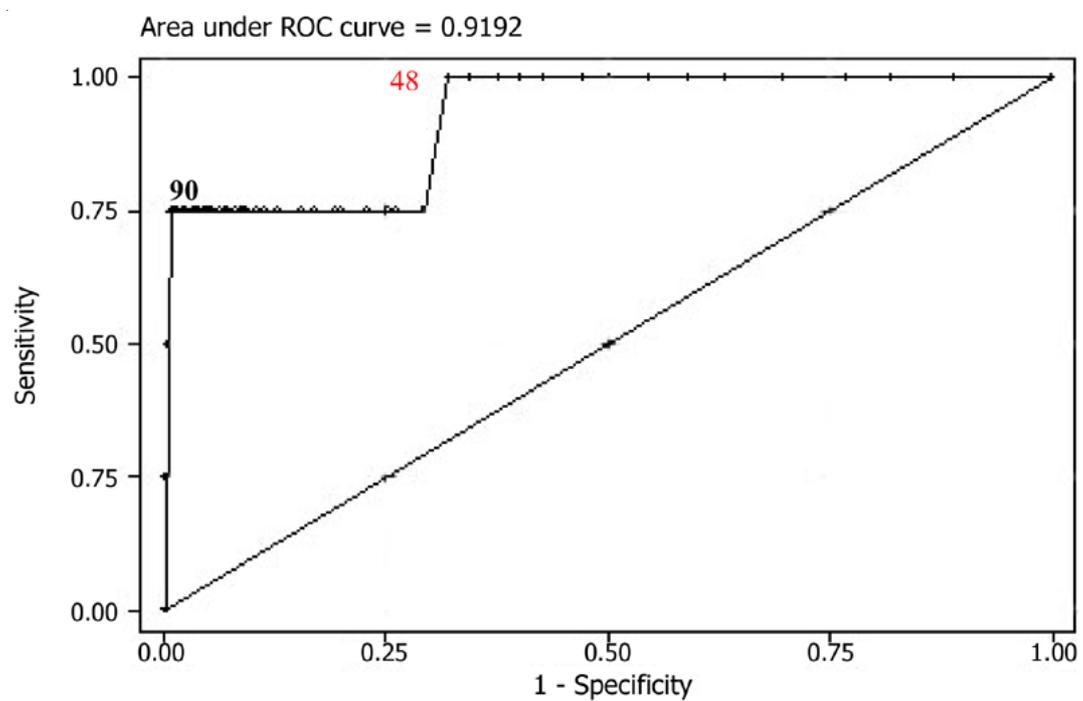


Fig. 2 Receiver operating characteristics (ROC) curve for the Thai version of the Postpartum Depression Screening Scale (PDSS) in detecting major depressive disorders

Table 1. Performance of the PDSS over a range of cut-off scores using DSM-IV (Major or Minor) and (Major only) depressive disorder criteria

PDSS cut-off score	DSM-IV (Major or Minor) depressive disorder			
	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
45/46	80	64	20	97
48/49	75	72	23	96
51/52	72	79	28	96
52/53	70	82	30	96
55/56	65	88	37	96
60/61	45	94	45	94

PDSS cut-off score	DSM-IV (Major only) depressive disorder			
	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
45/46	100	60	2	100
48/49	100	68	3	100
55/56	75	83	4	100
80/81	75	97	23	100
90/91	75	99	43	100

DSM-IV: Diagnostic and Statistical Manual for Mental Disorders-Fourth Edition
 PDSS: Postpartum Depression Screening Scale

risk of depressive disorders, the low positive predictive value in the present study setting notwithstanding.

Postpartum major depressive disorders in the present study were lower than in other reports. The original PDSS, tested in Connecticut in the USA, using DSM-IV as the gold standard, showed 12% of postpartum women with a major depressive disorder and 19% with a minor depressive disorder^(8,9). In another study, a lower prevalence of both major (6.6%) and minor (3.4%) depressive disorders was found in Norway⁽¹²⁾. Lee, et al⁽¹³⁾ found that postpartum depression diagnosed by DSM-III-R was 5.5% for major depressive disorders and 6.2% for minor depressive disorders in Hong Kong. There might be many reasons for such differences - for instance, one study suggested that the prevalence of postpartum depression depends on the sample setting and the study design⁽¹⁴⁾.

The postpartum time is a period of hormonal imbalance and many adjustments to being a mother, which make a woman prone to depressive disorders. The etiology of depression and postpartum depression is thought to be a combination of hormonal and social factors⁽¹⁵⁾. If postpartum depression is not recognized by health professionals, it can affect the marital relationship and maternal-infant interaction^(16,17). A good screening instrument is, thus an important

component of the physician's care of mothers, and perhaps more so in certain cultures^(8,13).

The original PDSS was developed and validated in English, and soon followed by a Spanish translation⁽⁸⁻¹⁰⁾. The alpha reliability of this Thai version for total PDSS score and each category was slightly lower than those of the original and Spanish versions, but still within an acceptable range. Using a cut-off score of 60 for screening major and minor postpartum depression and of 80 for screening major postpartum depressive disorders as the original PDSS recommends⁽⁹⁾, the sensitivity and positive predictive value of the Thai version were lower, influenced by the low prevalence of postpartum depression in the present study population. The likelihood ratio of a positive test using the Thai PDSS for screening minor or major depressive disorders was similar to the original PDSS (3.5 versus 3.2, respectively) but for major depressive disorders it was higher (74 versus 47, respectively)^(5,9).

At a recommended score of 51 for minor or major depressive disorders, the sensitivity of the Thai PDSS was higher but the specificity was lower than the original instrument. At a recommended score of 90 for major depressive disorders, the sensitivity and specificity of the Thai PDSS was similar⁽⁵⁾. Using a ROC curve to assess reliability, the area under the curve

represents the accuracy of a screening instrument. The larger the area under an ROC curve, the more accurate the instrument⁽¹⁸⁾. Although the area under the ROC curve in detecting postpartum depression with the major depressive disorders was larger than the major or minor depressive disorders, there was a limitation caused by the low number of postpartum women with a major depressive disorder in the present study.

High levels of the internal consistency reliably supported the accuracy of the assessments. Based on the validation of this PDSS, a cut-off score of 51 is recommended for screening postpartum women with major or minor depressive disorders and a cut-off score of 90 for those with major depressive disorder. As there is no other Thai-version validated screening instrument for postpartum depression, this is a useful and beneficial instrument, although further studies in other settings using this Thai PDSS are still needed.

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การสร้างแบบสอบถาม Postpartum Depression Screening Scale (PDSS) ฉบับภาษาไทย เพื่อคัดกรองโรคซึมเศร้าหลังคลอด

อานนท์ วิทยานนท์, ทิพวรรณ เลียบสีตระกุล, จารุรินทร์ พิณฑุพงษ์

การศึกษานี้มีวัตถุประสงค์เพื่อสร้างและประเมินคุณภาพของแบบสอบถาม Postpartum Depression Screening Scale (PDSS) ในการคัดกรองโรคซึมเศร้าหลังคลอด แบบสอบถามนี้มีการแปลมาจากฉบับจริงด้วยวิธี back translation และทดสอบในสตรีหลังคลอดที่ 6-8 สัปดาห์จำนวน 400 ราย ระหว่างเดือนพฤศจิกายน พ.ศ. 2546 ถึงเดือนกันยายน พ.ศ. 2547 ในโรงพยาบาลมหาวิทยาลัยในภาคใต้ของประเทศไทย โดยใช้เกณฑ์การวินิจฉัยโรคซึมเศร้าหลังคลอดจำแนกเป็นโรคซึมเศร้าอย่างรุนแรง (major depression) และไม่รุนแรง (minor depression) ของ Diagnostic and Statistical Manual for Mental Disorders-Fourth Edition ผลการวิจัยพบว่า ข้อคำถามในแบบสอบถามน่าเชื่อถือ โดยมี Cronbach's alpha เท่ากับ 0.9 ระดับคะแนนรวมที่มีความไว ความจำเพาะ และความสามารถในการทำนายผลบวกและลบที่เหมาะสมในการวินิจฉัยโรคซึมเศร้าทั้งชนิดไม่รุนแรงและรุนแรงเท่ากับ 51 ส่วนระดับคะแนนรวมที่มีความไว ความจำเพาะ และความสามารถในการทำนายผลบวกและลบที่เหมาะสมในการวินิจฉัยโรคซึมเศร้าเฉพาะชนิดรุนแรง เท่ากับ 90 แบบสอบถามนี้มีความสามารถในการจำแนกผู้ที่เป็นโรคออกจากผู้ไม่เป็นโรคได้ดี โดยโรคซึมเศร้าเฉพาะชนิดรุนแรงมีค่าพื้นที่ใต้กราฟเท่ากับ 0.9 ส่วนโรคซึมเศร้าทั้งชนิดไม่รุนแรงและรุนแรงมีค่าพื้นที่ใต้กราฟเท่ากับ 0.8 โดยสรุปแบบสอบถามนี้มีความน่าเชื่อถือ และมีความสามารถในการจำแนกผู้ที่ไม่เป็นโรคซึมเศร้าหลังคลอดออกจากผู้เป็นโรคได้ จึงเป็นประโยชน์อย่างมาก เนื่องจากยังไม่มีแบบสอบถามชนิดนี้ฉบับภาษาไทยเพื่อวินิจฉัยที่เฉพาะเจาะจงต่อโรคซึมเศร้าหลังคลอดมาก่อน
