http:// ijp.mums.ac.ir
Systematic Review (Pages: 10533-10540)

Sensitivity and Specificity of the Edinburgh Postnatal Depression Scale (EPDS) among Iranian Mothers: A Psychometric Study

Fatemeh Shoaee[1], Ziba Mohsenpour[1], Mohammad Reza Najarzadegan[2], Soudabeh Nekouhi[3], Parisa Razmjouei[4], Masoudeh Babakhanian[5], *Masumeh Ghazanfarpour[6], Fatemeh Rajab Dizavandi[7], Hossein Kareshki[8]

[1]Kowsar Hospital, Department of Gynecology and Obstetrics, Shiraz University of Medical Sciences, Shiraz, Iran. [2]Psychiatrist, Research Center for Addiction and Risky Behaviors (ReCARB), Iran University of Medical Sciences, Tehran, Iran. [3]Department of Pediatrics, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran. [4]Shahid Faghihi Hospital, Department of Gynecology and Obstetrics, Shiraz University of Medical Sciences, Shiraz, Iran. [5]Abnormal Uterine Bleeding Research Center, Semnan University of Medical Sciences, Semnan, Iran. [6]Nursing Research Center, Kerman University of Medical Sciences, Kerman, Iran. [7]Department of Community Health and Psychiatric Nursing, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran. [8]Department of Educational Psychology, Ferdowsi University of Mashhad, Iran.

Abstract

Background: There are few psychometric studies addressing sensitivity and specificity of the Persian version of the Edinburgh Postnatal Depression Scale (EPDS). Therefore, there is a need for future studies to identify the best cut-off point for EPDS score. The present study is aimed at assessing the validity of the EPDS among Iranian mothers.

Materials and Methods: The study is a secondary analysis on a descriptive correlational design to evaluate the sensitivity and the specificity of the Persian version of EPDS. The study was conducted in Mashhad, Iran, among 200 postpartum women attending routine post-natal care at six health service centers selected through stratified sampling method, and mothers completed the EPDS tool. Statistical analyses were performed using SPSS software version 16.0. The sensitivity and specificity of the EPDS were assessed against the DSM-IV criteria for depression with Receiver operating characteristic (ROC) curves using MedCalc statistical software (version 13.0).

Results: 30% of mothers were depressed based on the Edinburgh scale. The best cut-off point to discriminate mothers with depression (a combination major and minor depression) from normal women in postpartum period was >10 with sensitivity 87.95% and specificity 93.86%. The highest area under the receiver operating characteristic curve (ROC= 0.959). For women with major depression, the best cut-off point was 16 with sensitivity 94.12% and specificity 94.54% (ROC= 0.98).

Conclusion: In conclusion, the finding of this psychometric study showed the Persian version of EPDS can be used as a valid tool at a cut-off score of >10 to screen mothers with a combination major and minor depression and at cut-off score of >16 for screening those with major depression in postpartum period in health care center.

Key Words: Edinburgh Postnatal Depression Scale, Sensitivity, Specificity, Postpartum women.

*Please cite this article as: Shoaee F, Mohsenpour Z, Najarzadegan MR, Nekouhi S, Razmjouei P, Babakhanian M, et al. Sensitivity and Specificity of the Edinburgh Postnatal Depression Scale (EPDS) among Iranian Mothers: A Psychometric Study. Int J Pediatr 2019; 7(12): 1795-1802. DOI: **10.22038/ijp.2019.44006.3653**

Corresponding Author:

Dr. Masumeh Ghazanfarpour, Nursing Research Center, Kerman University of Medical Sciences, Kerman, Iran.

Email: Masumeh.ghazanfarpour@yahoo.com

Received date: Apr.19, 2019; Accepted date: Oct.22, 2019

1- INTRODUCTION

The postpartum period is one of the most vulnerable stages of women's life, as they experience various physical, mental and psychological complications during this period (1, 2). Postpartum depression is one of the most common psychological disorders after childbirth (3). Postpartum depression can be seen within two to six weeks after delivery in some women and is known to be a major depression disorder by the American Psychiatric Association, it is associated with mood symptoms such as appetite changes, insomnia, energy loss, low self-esteem, cognitive problems and anxiety (4, 5). Various studies reported a different prevalence of postpartum depression; for example, about 10-15% after the first birth (6), and about 34.8% in Iran (7). Postpartum depression has negative and destructive effects on the mother, infant and family, marital relationships, interactions and behavior with the infant, and exposes the infant to impairment in growth and development. It also causes behavioral, cognitive, social and emotional problems in the infants until the age of 4-8 years (8-10).

The long-term adverse effects of postpartum depression on mothers and infants have caused the researchers to seek valid tools for rapidly detecting depression during the postnatal period; one of which is the Edinburgh Postnatal Depression Scale (EPDS) developed by Cox in 1987 on the basis of deep interview (11). This questionnaire is suitable because of several features including ease of use, objectivity, targeting symptoms of depression and its shortened form (12). The validity and reliability of EPDS have been reported by few studies in Iran (11-13), with fewer studies (13, 14) addressing the two clinical aspects of each EPDS instrument: the sensitivity (the ability of a test to correctly diagnose a disorder), and the specificity (the ability of a test to correctly diagnose individuals without that disorder). Other clinical features of a tool include negative predictive value (the probability that subjects with a negative screening test truly do not have the disease), and positive predictive value (the probability that subjects with a positive screening test truly have the disease) (15). Kheirabadi et al. tested EPDS against the Hamilton Depression Rating Scale (HDRS) as gold standard. The optimal cut-off point was 12 with the sensitivity of 78% and specificity 75% and the area under the curve of 0.84 (13). Only one study assessed EPDS against the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV) as valid (14). Therefore, there is a need for future studies to identify optimal cut-off for EPDS score. The aim of the psychometric study was to analyze receiver operating characteristics (ROC) analysis to determine the sensitivity and specificity of the EPDS for identifying postpartum depression among Iranian postpartum women.

2- MATERIALS AND METHODS

2-1. Study Design

The study is a secondary analysis of a descriptive correlational design to evaluate the sensitivity and the specificity of EPDS among postpartum women. The study was conducted in Mashhad, Iran, among 200 postpartum women attending routine post-natal care at six health service centers selected through stratified sampling method between February and June 2018. Mothers were required to be able to understand both written and spoken Persian and be capable of completing a self-assessment scale (EPDS). All participants were required to give written consent prior to participating and full ethical approval for this study was obtained. Mothers were asked to complete the EPDS by the first author.

2-2. Exclusion criteria

Exclusion criteria included receiving mental health services from a health care provider and meeting the criteria for a current affective disorder, substance use disorder, anxiety disorder (excluding simple phobia), or psychosis determined by the Structured Clinical Interview for DSM-IV Childhood Diagnoses (KID-SCID) (16).

2-3. Instrument

EPDS was designed and developed by Cox et al. in 1987 in England to screen mothers with depression (11). The EPDS, focuses on psychic symptoms of depression and is designed to reduce the focus on somatic symptoms (i.e. poor sleep, weight gain or loss) that are common among women with depression. The EPDS has established psychometric properties and is one of the most widely used self-reported instruments to assess depressive symptoms in postpartum women, including minorities and teenagers. EPDS is a self-administered, 10-item scale; each item has four possible responses from 0 to 3, with a minimum score of 0 and a maximum of 30. The cutoff point used to identify women as high risk for postpartum depression varies, with most studies using a cutoff score of $\geq$10 or $\geq$12 (17, 18). Calculation of sensitivity, specificity, positive validation of questionnaire was assessed on a sample of 84 mothers through the Research Diagnostic Criteria for depressive illness, it has a satisfactory sensitivity and specificity (19). We evaluated the accuracy and validity of the EPDS for identifying postpartum mothers who met criteria for a major depressive disorder against the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) (14). All respondents signed a consent form prior to data collection and completed the EPDS questionnaire.

2-4. Statistical analysis

Statistical analyses were performed by using SPSS (version 20.0; SPSS, Chicago, Ill), and Receiver operating characteristic (ROC) analysis was done by MedCalc software version 13.0 (MedCalc Software, Mariakerke, Belgium). The ROC curve is a plot of the sensitivity versus [1-specificity] over all possible threshold values of the test being validated. EPDS's accuracy (proportion of results, both positive and negative, correctly identified by the EPDS) was estimated by the area under the ROC curve, against the DSM-IV criteria for depression using ROC curves. Youden's J index (Y=sensitivity+specificity−100) was calculated by ROC to identify the best cut-off for EPDS (19).

3- RESULTS

Mean age of postpartum women was 26.02 ±4.49 years old (range=16-35), and most mothers (n=71, 50.7%) had a high school degree (**Table.1**). 30% of mothers were depressed based on the Edinburgh scale. The best cut-off point based on the Youden Index to discriminate mothers with depression (a combination major and minor depression) from normal women in postpartum period was >10 with sensitivity 87.95% and specificity 93.86% (**Figure.1 and Table.2**).

The highest area under the receiver operating characteristic curve (ROC= 0.959±0.0128; p<0.001; 95% confidence interval (CI): 0.925 to 0.984 (**Table.2**). For women with major depression, the best cut-off point was 16 with sensitivity 94.12% and specificity 94.54%, respectively. The highest area under ROC= 0.98±0.00918; p<0.001; 95% CI: 0.949 to 0.994 (**Figure.2**).

Table-1: Characteristics of the sample included in the validation of the Edinburgh Postnatal Depression Scale (n = 200).

Variables	Number (%)/ Mean ± SD
Age, year	25.91±4.5
Number Of Children	3.18±1.92
Mother's Education	Number (%)
Illiterate	4(2)
Primary School	26(13)
Secondary School	33(16.5)
High School	101(50.5)
University	36(18)
Spouse's Education	Number (%)
Illiterate	3(1.5%)
Primary School	22(11%)
Secondary School	58(29%)
High School	79(39.5%)
University	38(19%)
Income Level	Number (%)
Less than Sufficient	43(21.5)
Sufficient	155(77.5)
More than Sufficient	2(10)
Exercise	Number (%)
Yes	22(11%)
No	178(89%)

SD: standard deviation.

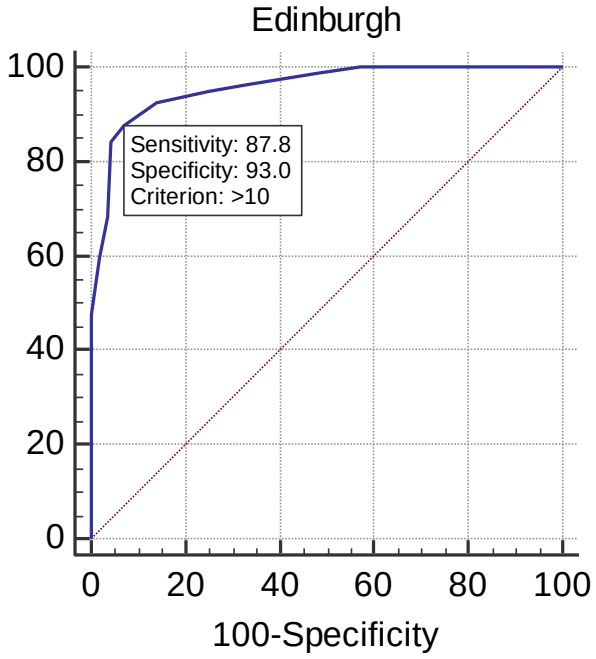

Fig.1: ROC curve according to the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV) for a combination major and minor depression.

Table-2: The sensitivity, specificity, accuracy (95% confidence intervals) for different EPDS cutoff points (n = 200).

Cutoff points	Sensitivity, %	95% CI	Specificity, %	95% CI
≥1	100.00	95.6 - 100.0	0.00	0.0 - 3.2
>5	100.00	95.6 - 100.0	42.61	33.4 - 52.2
>6	98.78	93.4 - 100.0	52.17	42.7 - 61.6
>7	96.34	89.7 - 99.2	66.96	57.6 - 75.4
>8	95.12	88.0 - 98.7	74.78	65.8 - 82.4
>9	92.68	84.8 - 97.3	86.09	78.4 - 91.8
>10	87.80	78.7 - 94.0	93.04	86.8 - 96.9
>11	84.15	74.4 - 91.3	95.65	90.1 - 98.6
>12	68.29	57.1 - 78.1	96.52	91.3 - 99.0
>13	59.76	48.3 - 70.4	98.26	93.9 - 99.8
>14	47.56	36.4 - 58.9	100.00	96.8 - 100.0

95% CI: 95% confidence interval.

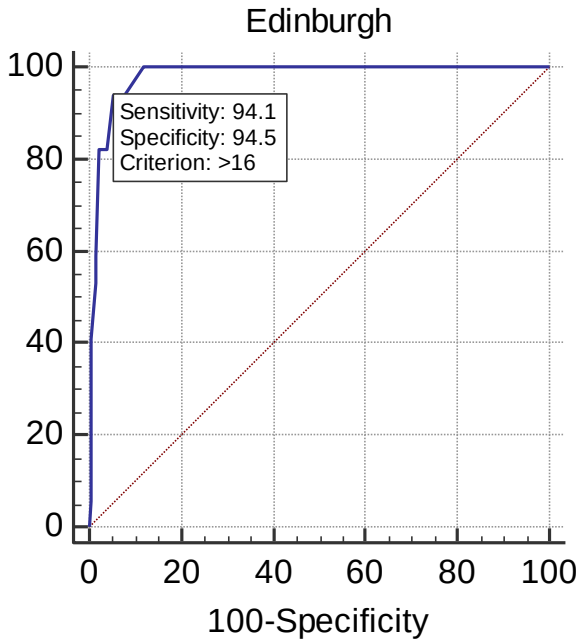

Fig.2: ROC curve according to the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV) for major depression.

4- DISCUSSION

The EPDS is widely used and accepted for screening depression in postnatal period in primary health care. However, the performance of the EPDS over the range of cut-off score with sensitivity, specificity and positive predictive values in an acceptable range were reported in different cultural contexts (20). The aim of this study was to assess some psychometric properties of the Persian version of the EPDS including, cut-off points, sensitivity and specificity. Our finding of the Persian version of

EPDS suggested that the best cutoff scores for a combined major and minor and major depression were 10/11 and >16, respectively. The original version of the EPDS conducted for the validation of the EPDS suggested a cut-off 12/13 to screen depression during pregnancy (19). With a similar, cutoff (12/13), our study showed sensitivity and specificity, 68 and 96%, respectively. Shrestha et al. conducted a systematic review to provide a review of reliability and validity of EPDS among women in low- and lower-middle-income countries. Accordingly, this study, version of the EPDS reported a cut-off score of 12/13, sensitivity 68.4%, specificity: 93.8%, Indian version showing cut-off score of 12/13, sensitivity 100% and specificity 84.9%, Nigeria version indicating a cut-off score of 9/10, sensitivity 86.7%, and specificity 91.5%, Pakistan version showing 13/14, sensitivity 79% and specificity: 74%, Bangladesh showing a cut-off score of 9/10, sensitivity 88.9% and specificity 86.8%, Ethiopia version indicating a cut-off score of 6/7, sensitivity 78.9% and specificity 75.3% (21).

The variability seen in the findings of these studies may be related to differences in the target populations. Chibanda et al. (20) reported a similar limit for cut-off (>10), and sensitivity (0.88), but lower values for specificity (0.88). Weobong et al. reported a similar cut-off (>10), but lower values for sensitivity (0.78), and specificity (0.73) (22). In Mazhari and Nakhaee's study (14), the best cut-off scores to detect major depression was 12/13 with a sensitivity 95.3% and specificity 87.9%; while, the best cut-off scores was found to be >16 in the current study. Kheirabadi et al. (13) tested EPDS against the Hamilton Depression Rating Scale (HDRS) as the gold standard. The optimal cut-off point was 13 with the sensitivity of 78% and specificity 75% and the area under the curve of 0.84. 67.3%. The discordance in finding between our study and Kheirabadi et al.'s study (13) could be due to the differences in the gold standard as well as the target populations. In Ahmadi kani Golzar and Golizadeh's study, 31.6% of women had depression based on the Edinburgh scale and the Beck inventory, respectively; while only 19.7% were diagnosed to be depressed using the clinical structured interview (12). In our study, 30% of mothers were depressed based on the Edinburgh scale and 45.5% were diagnosed to be depressed using the clinical structured interview. Differences in populations may be responsible for variations seen in the cut-off between our study and other systematic review-meta-analysis (24, 25).

4-1. Sstrengths and Limitations of the study

One of strengths of the subjects of this study was the illiteracy rate (4.5%) which caused a response bias which was lower than previous studies conducted in Iran (14). Another of strength, was that this study was conducted in Mashhad, the second most populous city and has with a multicultural population, in which people from various ethnic groups lived (23); our sample can therefore be considered as a representative of the population as a whole. There were some limitations in this study. First, the sample size was relatively small. The prevalence rate of postnatal depression for current studies was 30%. It is more than of the prevalence rate found in national and international meta-analysis. A meta-analysis of 14 studies in Iran published in 2013 reported a prevalence rate of 25.3% (95% CI: 22.7%–27.9%) (24). The world prevalence rate was reported to be 17% according to a meta-analysis of 58 studies published in 2018 (25). Generalizability of current studies is limited by this fact, the positive and negative predictive value may be affected by the prevalence rate (20).

5- CONCLUSION

In conclusion, the findings of this psychometric study showed that the Persian version of EPDS can be used as a valid tool at a cut-off score of >10 to screen mothers with a combination major and minor depression and at a cut-off score of >16 for screening those with major depression in the postpartum period in health care centers.

6- CONFLICT OF INTEREST: None.

7- REFERENCES

1. Mirmolaei T, Amel Valizadeh M, Mahmoodi M, Tavakkol Z. The effect of postpartum care at home on maternal received care and satisfaction. Evidence Based Care. 2011; 1(1):35-50.

2. Effati Daryani F, Mohammad Alizadeh Charandabi S, Zarei S, Mohammadi A, Mirghafourvand M. Effect of Lavender cream with or without footbath on anxiety, stress and depression of women in postpartum: A clinical randomized controlled trial. The Iranian Journal of Obstetrics, Gynecology and Infertility. 2017; 20(10):52-61.

3. Nehbandani S, Nahidi F, Kariman N, Nasiri M. Relationship between gestational diabetes and postpartum depression. The Iranian Journal of Obstetrics, Gynecology and Infertility. 2016; 19(7):18-24.

4. Edition F. Diagnostic and statistical manual of mental disorders: Am Psychiatric Assoc; 2013.

5. Ghazanfarpour M, Dizavandi FR, Kargarfard L, Heidari E, Khadivzadeh T, Saeidi M, et al. Psychotherapy for Postpartum Depression in Iranian Women: A Systematic Review and Meta-Analysis. Analysis. 2018; 6(6):7781-90.

6. Almond P. Postnatal depression: a global public health perspective. Perspectives in public health. 2009; 129(5):221-7.

7. Taherifard P, Delpisheh A, Shirali R, Afkhamzadeh A, Veisani Y. Socioeconomic, psychiatric and materiality determinants and risk of postpartum depression in border city of ilam, Western Iran. Depression research and treatment. Depress Res Treat. 2013; 2013: 653471.

8. Patel M, Bailey RK, Jabeen S, Ali S, Barker NC, Osiezagha K. Postpartum depression: a review. Journal of health care for the poor and underserved. 2012; 23(2):534-42.

9. Pour EG, Azizi A, Mohamadi J. The Efficacy of Detached Mindfulness in Meta-Cognitive Therapy on Postpartum Depression. Journal of Nursing Education 2016;5(5):17-22.

10. Nasiri S, Kordi M, Ebrahimzadeh S, Modarres Gharavi M. The effect of problem solving skills training on severity of depression symptoms in postpartum period. J Fundament Ment Health. 2012; 14(55):226-35.

11. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. Br J Psychiatry 1987, 150:782–86.

12. Ahmadi kani Golzar A, GoliZadeh Z. Validation of Edinburgh Postpartum Depression Scale (EPDS) for screening postpartum depression in Iran. Iranian Journal of Psychiatric Nursing. 2015; 3(3):1-10.

13. Kheirabadi GR, Maracy MR, Akbaripour S, Masaeli N. Psychometric properties and diagnostic accuracy of the edinburgh postnatal depression scale in a sample of Iranian women. Iranian journal of medical sciences. 2012; 37(1):32.

14. Mazhari S, Nakhaee N. Validation of the Edinburgh postnatal depression scale in an Iranian sample. Archives of women's mental health. 2007; 10(6):293-7.

15. Mojiri F, Shekari E, Ashoorion V. Determination of psychometric characteristics of Isfahan primary school teachers' specific voice disorders questionnaires. J Res Rehabil Sci 2014; 9(6): 1038-49.

16. Hein D, Matzner F, First M, Spitzer R, Williams J, Gibbons M. Structured Clinical Interview for DSM-IV Childhood Disorders, KID-SCID. New York, NY: Department of Psychiatry, Columbia University Medical School; 1998.

17. Murray L, Carothers AD. The validation of the Edinburgh Post-natal Depression Scale on

a community sample. Br J Psychiatry. 1990; 157: 288–90.

18. Lawrie TA, Hofmeyr GJ, de Jager M, Berk M. Validation of the Edinburgh Postnatal Depression Scale on a cohort of South African women. S Afr Med J. 1998; 88(10): 1340–44.

19. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression: development of the 10-item Edinburgh Postnatal Depression Scale. The British Journal of Psychiatry. 1987; 150(6):782-6.

20. Chibanda D, Mangezi W, Tshimanga M, Woelk G, Rusakaniko P, Stranix-Chibanda L, et al. Validation of the Edinburgh Postnatal Depression Scale among women in a high HIV prevalence area in urban Zimbabwe. Archives of women's mental health. 2010; 13(3):201-6.

21. Shrestha SD, Pradhan R, Tran TD, Gualano RC, Fisher JR. Reliability and validity of the Edinburgh Postnatal Depression Scale (EPDS) for detecting perinatal common mental disorders (PCMDs) among women in low-and lower-middle-income countries: a systematic review. BMC pregnancy and childbirth. 2016; 16(1):72.

22. Weobong B, Akpalu B, Doku V, Owusu-Agyei S, Hurt L, Kirkwood B, et al. The comparative validity of screening scales for postnatal common mental disorder in Kintampo, Ghana. Journal of affective disorders. 2009; 113(1-2):109-17.

23. Saboori F, Pishghadam R. English Language Teachers' Burnout within the Cultural Dimensions Framework. The Asia-Pacific Education Researcher. 2016; 25(4):677-87.

24. Yousef Veisani, Ali Delpisheh, Kourosh Sayehmiri, and Shahab Rezaeian. Trends of Postpartum Depression in Iran: A Systematic Review and Meta-Analysis. Depression Research and Treatment, vol. 2013, Article ID 291029, 8 pages, 2013. https://doi.org/10.1155/2013/291029.

25. Shorey S, Chee CYI, Ng ED, Chan YH, San Tam WW, Chong YS. Prevalence and incidence of postpartum depression among healthy mothers: a systematic review and meta-analysis. Journal of psychiatric research. 2018; 104: 235-48.