Validating the Edinburgh Postnatal Depression Scale (EPDS) for use in less at risk Ugandan postpartum women

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Abstract

Background

Although the Edinburgh Postnatal Depression Scale (EPDS) has been recognized as a reliable screening scale for postpartum depression among mothers worldwide, no study has validated this scale in Uganda. The objective of this study was to establish the accuracy of the EPDS as a screening scale for postpartum depression (PPD) for use in less at risk Ugandan postpartum women in comparison with the Mini-International Neuropsychiatric Interview (MINI 7.0.2) for the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5).

Methods

We conducted a descriptive, cross-sectional study at one regional referral hospital and two peri-urban primary care postpartum clinics that serve a rural community in the southwestern region of Uganda. The study targeted 287 mothers aged 18 to 49 years during their six weeks' postpartum visit. During data collection, mothers were first screened using the EPDS in one of the private rooms and then clinically diagnosed in another private room using the MINI 7.0.2. With the EPDS, PPD was diagnosed if the mother had a cutoff point of ≥ 10. Runyankore-Rukiga was the language used in the Ugandan version of the EPDS and this data was obtained from 11th November 2019 to 10th June 2020. The accuracy of the EPDS was determined using the MINI 7.0.2 as a reference standard.

Results

A total of 287 mothers aged 18 to 49 years during their six weeks' postpartum visit were included in the study. Overall PPD prevalence was 29.5% versus 26.5% with EPDS and the MINI 7.0.2 for the DSM-5 diagnostic criteria for depression respectively, p = 0.239. The sensitivity, specificity, positive predictive value and negative predictive value of the EPDS established by this study were 86.8%, 92.1%, 80.5% and 94.9% respectively. The cut-off point ≥10 was the most acceptable point in detecting mothers suffering from PPD. The area under the ROC curve that shows the overall performance of the scale against the MINI 7.0.2 was 0.89 for Bwizibwera HCIV, 0.97 for Kinoni HCIV and 0.84 for MRRH.

Conclusion

EPDS can successfully screen for postpartum depression in southwestern Uganda at a cutoff score of ≥10. It has a good diagnostic performance to correctly detect PPD among postpartum mothers.

Background

The short and long term impact of postpartum depression (PPD) on the mother, her marital relationship, the children and community make it an important condition to screen, diagnose, treat and prevent (1). Routine use of screening scales for the purpose of identifying PPD symptoms is an effective, simple and economical way to identify women at risk for the disorder (2). Validating these screening scales provides

standard clinical scales to compare symptoms and treatment efficacy across different populations of diverse cultural, emotional and economic backgrounds. There are several screening instruments for PPD and the most commonly used scale is the Edinburgh Postnatal Depression Scale (EPDS) (3, 4). The EPDS was originally developed in Edinburgh by Scottish Health Centers in 1987 (5). It can be self-administered in literate communities and researcher administered for mothers who cannot read and write (3). The health worker administering this scale may not have specialized training in psychiatric disorders but should be familiar with mental health problems (6). The EPDS is used to assess emotional experiences over the previous seven days using ten Likert-scale items by assessing for sadness and fearfulness, loss of interest, anxiety and worry, sleep deficit, self-blame, sense of being overwhelmed, and suicidal ideation in postpartum women (7). It is simple, quick to score and has shown high acceptability levels by patients as well as being readily available without purchase expenses (8).

During validation of the EPDS among Scottish women in Edinburgh, the scale demonstrated a sensitivity of 86%, specificity of 78% yielding a positive predictive value of 73% at a cut-off of 10 or more out of 30 as set by Cox (3). In a primary health care setting the scale is recommended for its ability to detect change in the severity of depression over time (6, 9). The few studies that were conducted in African settings reported the EPDS as a valid scale for assessing PPD. For example, Khalifa and others (10) validated the EPDS against the Mini-International Neuropsychiatric Interview among postpartum women in South Sudan and the sensitivity and specificity were 89% and 82%, respectively. A related validation of the EPDS in Shona language against the DSM-IV criteria for major depression in Zimbabwe recorded sensitivity of 78% and specificity of 89% (11) whereas in the Amharic language in Ethiopia researchers validated the EPDS against the Comprehensive Psychopathological Rating Scale (CPRS) and reported 78.9% sensitivity and 75.3% specificity (12).

Although this scale has been validated in several countries, 60 languages and populations, it has been validated in very few African settings and most of these validations were for specific postpartum populations like postpartum mothers who are living with HIV or antenatal women (2, 5, 13). As far as we know, the EPDS has not been validated to establish the psychometrics in the Ugandan local context, yet a preliminary cross-sectional study revealed a high PPD prevalence of 27.1% using the clinical diagnostic criteria (14), hence there is a need to validate a reliable screening tool in this setting. The few studies on validation of the EPDS could be attributed to the fact that PPD was largely considered to be a Western phenomenon, with infrequent documentation in low-resource settings (9, 15, 16). However, currently PPD is becoming a public health threat in low-resource settings such as Uganda and it requires a method of measuring depressive symptoms that is both valid and practical to administer. Such studies require careful consideration of the impact that culture and language may have upon the validity of the measures used. Whereas in general, PPD is characterized by loss of interest in usual events, sleep challenges, feelings of sadness, fatigability, problems of appetite, and difficulty in coping with daily activities (6), literature suggests that the presentation of PPD is different for African mothers as compared to mothers in high income countries like Scotland. A study carried out by Cox and colleagues revealed that Ugandan women were more likely to describe somatic symptoms like backaches, headaches during their routine postpartum health visits and less likely to express emotional feelings as

compared to the Scottish mothers (6, 17) yet PPD manifests as a psychological clinical profile. This disparity in symptoms compromises accurate screening of mothers suffering from PPD, hence increasing the risk of consequences from this condition. The EPDS was developed to be used among the Scottish postpartum women. Consensus has emerged that such a scale can be used in other settings but that there must be a careful process of translation and validation by establishing its sensitivity, specificity and predictive values before usage to ensure cross-cultural equivalence (18–20). Moreover, researchers stress that a screening instrument must go through a formal validation in a particular population before it is implemented into practice (21). This was the basis on which this study validated the EPDS against the DSM-5 diagnostic criteria using the MINI 7.0.2 in the Ugandan context to determine its appropriateness in detecting PPD among women in southwestern Uganda.

Methods

Study design and setting

This descriptive, cross-sectional study was conducted at one regional referral hospital (Mbarara Regional Referral Hospital-MRRH) and two peri-urban primary care postpartum clinics (Bwizibwera Health Centre IV-BHC IV and Kinoni Health Centre IV-KHC IV that serve the rural community with low incomes and low rates of formal education in Mbarara and Rwampara districts, south western region of Uganda. BHC IV and KHC IV are within a 26.3 km and 39.9 km radius respectively from MRRH located in the centre of Mbarara city. Services are provided free at all the clinics and the staffs at both clinics are employed by the government of Uganda. The most widely spoken language is Runyankore-Rukiga. This was part of a larger research project that determined the prevalence and associated factors of PPD in Mbarara and Rwampara districts, south western Uganda (14).

Study population and eligibility criteria

This study targeted 18 to 49 years old mothers during their six weeks' postpartum visit to the clinic for their routine six weeks' postpartum check-up. This data was obtained from 11th November 2019 to 10th June 2020. The eligibility criteria included women able to speak and understand Runyankore-Rukiga, had delivered a live baby and were willing to participate in the study. Women who were not fluent in Runyankore-Rukiga were excluded, as were mothers who were sick with severe medical illness, personal and family history of mood disorder were excluded as physical symptoms (insomnia, anorexia, decreased concentration and pain etc.) could mimic those of depression and may bias the sample.

Sample size calculation

The sample size estimation for anticipated sensitivity and specificity was determined by the Burderer's formula (22). Because the prevalence of PPD in Uganda was unknown at the time this study commenced but was later determined in a separate part of the current study, an arbitrary value of 50% had been assumed.

$$\text{Sample size (n) based on sensitivity} = \frac{Z^2_{1-\alpha/2} \times S_N \times (1-S_N)}{L^2 \times \text{Prevalence}}, \text{ and}$$

$$\text{Sample size (n) based on specificity} = \frac{Z^2_{1-\alpha/2} \times S_P \times (1-S_P)}{L^2 \times (1-\text{Prevalence})},$$

Where n = required sample size,

S_N = anticipated sensitivity of EPDS as compared to MINI 7.0.2 = 82%. This was calculated as an average of the sensitivities of 89%, 78.9% and 78% that had been reported in Sudan, Ethiopia, and Zimbabwe respectively (11, 23, 24).

S_P = anticipated specificity of EPDS as compared to MINI 7.0.2 = 82.1%. This was calculated as an average of the specificity of 82%, 75.3% and 89% that had been reported in Ethiopia, Zimbabwe and South Africa respectively (11, 23, 24).

α = size of the critical region = 0.1

$z_{1-\alpha/2}$ =1.96

L = absolute precision desired on either side of sensitivity or specificity = 0.09

After additional 10% to cater for non-response, a sensitivity based sample size of 287 postpartum mothers were enrolled into the study.

Data collection tools

The Edinburgh Postnatal Depression Scale (3) is a 10-item Likert scale (range 0–30). It is designed to screen for PPD by assessing for sadness and fearfulness, loss of interest, anxiety and worry, sleep deficit, self-blame, sense of being overwhelmed, and suicidal ideation (3). The original authors recommended that the cutoff point of this scale should be set at ≥ 10 out of a total score of 30 (3). They further noted that this scale does not rely on somatic symptoms, which is common in postpartum women irrespective of depression.

The MINI 7.0.2 according to the DSM-5 (25) was used to diagnose mothers suffering from postpartum depression. This is a semi-structured interview that assesses 17 most common disorders in mental health according to the DSM-5 but for this study we focused on symptoms of major depression.

Translation and back translation of the EPDS before data collection

After obtaining permission from the original authors, the English version of the EPDS was translated into Runyankore-Rukiga by trained, bilingual professional translators (psychiatrist, graduate nurse and a midwife) who were on the study team. The team met to discuss the translations and ensure a version almost identical to the original one. The translated copies were then back translated to English for

consistency and accuracy by two independent bilingual Runyankore-Rukiga speaking Ugandans, neither of whom are mental health experts. The translated and back translated content received no modification as this version was identical with the original English EPDS and this was in accordance with the principles for translation of the EPDS described in the EPDS manual (6). To evaluate if the initial translation was accurately performed, a pilot analysis was done with five women in Municipal Health Centre IV which is out of the study area. The Runyankore-Rukiga version of the EPDS is provided as Additional files 1.

Participant recruitment and data collection process

Before study initiation, staff at the three postpartum clinic sites attended a 3-day training session conducted by investigators, in which the study procedures were explained in detail, including data collection and interview techniques with a focus on how to administer the different scales in different rooms. To evaluate criterion validity of the EPDS, we validated it against the MINI 7.0.2. The MINI 7.0.2 is designed to be administered by trained mental health workers. After obtaining consent from the eligible mothers and enrolling them into the study at each site, they were screened with the EPDS. The consenting, recruitment and screening process was implemented by trained nurses or midwives in one of the private rooms at each study site. Shortly afterwards, a clinical diagnosis was made on each participant in another private room by a psychiatric medical doctor or clinician using a MINI 7.0.2 for DSM-5. The MINI 7.0.2 was considered the gold standard. Total scores of the EPDS were calculated and scored by the first author at the end of each data collection day as a quality control. The clinicians conducting the MINI 7.0.2 diagnostic evaluations were blinded to the initial screening results of the EPDS. Recruitment of study participants was carried out until the sample size was achieved. All participants were subjected to the EPDS and a clinical evaluation using the MINI 7.0.2.

Data management

The EPDS data set was reviewed against the MINI 7.0.2 data set. To determine psychometric properties of the EPDS, data set of the EPDS was retrieved, reviewed, analyzed and compared against the data set obtained using the MINI 7.0.2. Among the cases with PPD, the true positives (positive on both scales) and false negatives (positive on the MINI 7.0.2 and negative on the EPDS) were identified. This process was also repeated for the controls without PPD where the true negatives and false positives were identified).

The sensitivity was calculated by dividing the number of participants who are true positive against the total number of cases identified using the MINI 7.0.2 and multiplied by 100%. For the specificity of the EPDS, the participants who tested negative on both scales were divided by the total number of controls as identified by the MINI 7.0.2 and multiplied by 100%.

The non-parametric Youden index ROC analysis method was used to generate the sensitivity, specificity and the predictive values for each cutoff point based on the EPDS score. It defines the optimal cutoff point which is the difference between true positive rate and false positive rate over all possible cutoff point values.

Statistical analysis

Data from the EPDS and structured clinical interview were analyzed regarding their sensitivity, specificity, positive predictive (PPV) and negative predictive values (NPV) using the software package EPI-INFO software version 7.2. Confidence intervals were computed by embedding the calculations in a logistic regression. To estimate the ability of the EPDS to discriminate a group of women with postpartum depression from the group without postpartum depression, the average scores of both groups were calculated and compared. The sensitivity, specificity, positive predictive value and negative predictive value of the translated version of EPDS were obtained to determine the psychometric properties of EPDS.

Results

Socio-demographic Characteristics of the Study Population

The sample was comprised 287 postpartum women who were enrolled into the study between November 2019 and June 2020, with 149 enrolled from MRRH, 92 from BHC-IV and 46 from KHC-IV. The socio-demographic characteristics were described in terms of age, marital status, tribe, level of education, type of residence, religion, occupation and type of housing. Of 287 women, the group with the largest proportion were between 25 and 34 years (45.6%), were married (95.5%), identified as Banyankore by tribe (76.7%), had attained at least secondary school education (36.9%), were residing in urban areas (66.2%), were protestants by religion (49.8%), business women (39.7%) and were dwelling in permanent houses (79.1%) See Table 1.

Table 1
Socio-demographic characteristics of the participants

Characteristic	N = 287 Frequency (n)	Percent (%)
Health facility	92	32.1
Bwizibwera	46	16.0
Kinoni	149	51.9
MRRH		
Age	16	5.6
< 20	102	35.5
20−24	131	45.6
25−34	38	13.2
35−49		
Residence	97	33.8
Rural	190	66.2
Urban		
Tribe	220	76.7
Munyankore	17	5.9
Muganda	30	10.5
Mukiga	20	6.97
Others		
Education	4	1.4
None	96	33.5
Primary	106	36.9
Secondary	81	28.2
Tertiary		
Marital status	13	4.5
Unmarried	274	95.5
Married		

Characteristic	N = 287 Frequency (n)	Percent (%)
Religion	91	31.7
Catholic	143	49.8
Protestant	24	8.4
Moslem	29	10.1
Others		
Occupation	60	20.9
Unemployed	114	39.7
Business	55	19.2
Subsistence farmer	48	16.7
Professional	10	3.5
Manual labourer		
Housing	227	79.1
Permanent	60	20.9
Temporary		

EPDS cutoff point

Cutoff points are used to assess the threshold above which the tests are most accurate to identify the presence of PPD in a given setting. For this, the corresponding measures of determining the validity indices of different cutoffs of the EPDS for screening for PPD were computed against the clinical diagnosis as guided by the MINI 7.0.2 according to the DSM-5. The levels of sensitivity (proportion of mothers suffering from PPD according to MINI 7.0.2 that were correctly identified by EPDS), specificity (proportion of mothers not suffering from PPD correctly identified as such by EPDS), positive predictive value (proportion of true positives among all positives identified by EPDS) and negative predictive value (proportion of true negatives among all negatives identification by EPDS) were computed. The best cutoff point of the EPDS was found at 10 (Table 2).

Table 2
EPDS cutoffs point

Cut-off point	Sensitivity	Specificity
> 7	92.1%	65.8%
> 8	89.5%	72.8%
> 9	88.2%	82.7%
> 10	86.8%	92.1%
> 11	76.3%	95.1%
> 12	67.1%	97%
> 13	54%	98%
> 14	48.7%	98.5%
> 15	35.5%	99%

The level of accuracy of the EPDS compared to the MINI 7.0.2 in determining the prevalence of PPD among women in south western Uganda

Following the validation results, the EPDS was used to determine the overall postpartum depression prevalence at a cutoff point of ≥ 10 and this test yielded 29.5% based on the EPDS as compared to 26.5% with the MINI 7.0.2. The overall PPD prevalence of the two tests was not statistically significant (p = 0.239). This resulted in 66 women as levels of true positives / TP and 16 as levels of false positives / FP (Table 3). The level of accuracy of the EPDS versus the MINI 7.0.2 is 90.6%

= ((TN + TP) / Total) * 100

= ((186 + 66) / 278) * 100,

This high level of concordance between the diagnostic MINI 7.0.2 and the EPDS implies that there is not statistical difference between the two tests in detecting PPD among women in the Ugandan context.

Table 3
Comparing the level of accuracy of the EPDS against the MINI 7.0.2

Diagnosis by Gold standard test (MINI 7.0.2)			Total
	Positive (+ ve)	Negative (-ve)	
Screening by EPDS Positive (+ ve)	66 (True positive/TP)	16 (False positive/FP)	82
Negative (-ve)	10 (False negative/FN)	186 (True negative/TN)	196
Total	76	202	278

Psychometric properties of the EPDS at ≥ 10 cut off point in screening for of PPD

The psychometric properties of the EPDS using a cutoff point of ≥ 10 were calculated with the actual PPD status of the participants according to the MINI 7.0.2. The test characteristics overall revealed a sensitivity of 86.8% and specificity of 92.1%. The likelihood ratio (LR) for PPD when the test is positive (LR + ve) is 10.96, and the LR of a negative test (LR − ve) is 0.14. There is a strong positive relationship between EPDS and the MINI 7.0.2 illustrated by an odds ratio of 76.72. The Positive predictive value (PPV) and negative predictive value (NPV) were both calculated, resulting in 80.5% and 94.9% respectively as described below:

Sensitivity = 66/66 + 10 = 0.868 = 86.8%

Specificity = 186/186 + 16 = 0.921 = 92.1%

PPV = 66/66 + 16 = 0.805 = 80.5%

NPV = 186/186 + 10 = 0.949 = 94.9%

The psychometric properties were also stratified by health facility and age category in order to establish any variations between the study sites; no statistically significant variations were noted, see Table 4.

Table 4
Psychometric properties of the EPDS at ≥ 10 cut off
point in screening for PPD

Diagnostic Parameter	95% (CI)
Sensitivity	86.8 (77.1−93.5)
Specificity	92.1 (87.5−95.4)
Positive Predictive value (PPV)	80.5 (70.3−88.4)
Negative Predictive value (NPV)	94.9 (90.8−97.5)

Area under the Receiver Operating Characteristic (ROC) for EPDS versus the MINI 7.0.2 in screening for PPD across different health facilities

The accuracy of EPDS for PPD is demonstrated in the Receiver Operating Characteristic (ROC) curve for the EPDS against the MINI 7.0.2. ROC curve for the determination of sensitivity and specificity at a cutoff point of ≥ 10 was plotted by computing area under the curve (AUC) as Fig. 1. The nonparametric analysis of the ROC yielded an area under the curve of 0.89 for Bwizibwera HCIV, 0.97 for Kinoni HCIV and 0.84 for MRRH (overall 95% confidence interval 0.85−0.93). This indicates that the test can significantly distinguish between postpartum mothers who are truly depressed and those mothers who are not depressed at the cutoff point of ≥ 10.

Discussion

The EPDS is a simple, valid and effective screening scale for detection of postpartum depression among postpartum mothers in an urban and peri-urban primary care setting serving the rural community with high postpartum depression prevalence. We found an overall PPD prevalence of 29.5% using the Edinburgh Postnatal Depression scale (EPDS) at a cutoff point of ≥ 10 and this was comparable with a prevalence of 26.5% as determined by the MINI 7.0.2. The PPD prevalence rate determined by these scales falls within the same range with results of various studies in African countries such as South Africa (31.7%) (26), Zimbabwe (33%) (11), and Nigeria (22.9%) (27). Other studies in Africa have however reported a much lower prevalence rate of 12% in Tanzania (28), 9.2% in Sudan (23) and 13% in Kenya (29). Although all these studies used EPDS scale, it is difficult to compare results of the current study with the above studies because of the variations in the PPD prevalence potentially due to the different categories of postpartum women, sample sizes used, cutoff points, reference scales and timeframe of assessment with regard to their risk of PPD. Having excluded women with the most important risk factors for postpartum depression from this research, could also reach prevalence values higher than 26.5% as determined by the MINI 7.0.2. These results therefore imply that in the if the general Ugandan population of postpartum women is subjected to the EPDS, about half of them may be found to be suffering from PPD.

A cut off point for a local setting like Uganda is essential for accurate detection and PPD burden estimation. As such, the present study confirmed that a cutoff point of ≥ 10 as the suitable cutoff point for the EPDS which is similar to the cutoff identified in the original English version by (3). These findings are also in the same range with cutoff points reported by other validation studies in African countries such as Ghana ≥ 10 (30), Zimbabwe ≥ 10 (11). However, the cutoff point established by this study was higher than related studies carried out in Nigeria ≥ 8) (31), and Ethiopia ≥ 5 (32). The variation between the present study and other validation studies in Africa is attributed to diversity in economic circumstances, socio-cultural norms and the heterogeneous nature of study populations. It is particularly important to choose accurate psychometric property findings in a low-income setting as they may not place a burden on the health service through an overly high false-positive rate.

The sensitivity, specificity, positive predictive value and negative predictive value of the EPDS was established by this study to be 86.8%, 92.1%, 80.5% and 94.9% respectively. The sensitivity between 80 and 90% is considered to have good diagnostic performance meaning that the EPDS can correctly identify women who are suffering from postpartum depression, hence in this population the EPDS provides good sensitivity. Similarly, specificity of 92.1% is also considered quite good to correctly identify women who do not have postpartum depression. In addition, the study stratified mothers according to the health facility and age category to compare the psychometric properties of the EPDS across variables and to also ensure generalizability of the findings. The level of accuracy of this scale is comparable and within this sample no statistically significant variations occurred even when stratified. Therefore, the EPDS is identified as a valid scale in measuring postpartum depression in the Ugandan context in this study sample. These study findings are consistent with data from other validation studies in low resource settings where EPDS has been validated in local languages in similar demographically representative settings. For example, systematic reviews reported strong reliability and validity of EPDS for detecting perinatal common disorders among women in low and lower-middle income countries (11, 12, 23). The high sensitivity test reveals that the index scale can establish that there are few false negative results, and thus fewer cases of disease are missed. This also applies to the high specificity revealed as this is important for ruling in disease or mothers with PPD (33). In low-resource settings like Uganda, the strength of the EPDS lies in its high NPV, meaning that with negative results there is high level of confidence that women are free from PPD. The acceptable sensitivity and specificity findings will help in the identification of Ugandan postpartum women at risk of depression.

The present study carried out a nonparametric analysis of the ROC which yielded an area under the curve of 0.89 for Bwizibwera HCIV, 0.97 for Kinoni HCIV and 0.84 for MRRH, implying that the EPDS can effectively distinguish between postpartum mothers who are truly depressed and those women who are not depressed at the cutoff point of ≥ 10.

Strengths and Limitations

The strength of our study is that it was conducted in an urban and peri-urban setting that serves the rural population. Although some studies had utilized this scale in screening for PPD without validation to the

Ugandan population (34), this is the first study that translated and established the accuracy of the EPDS in screening mothers with PPD in Uganda. An important limitation of this study was not including women receiving postpartum services from the private clinics and the general population of postpartum women therefore it may not be generalized to this population as it is likely to be higher than the current findings. In addition, this study only focused on the current episode of major depression without assessing for the past episodes of depression as the EPDS only considers the current depression. Not including past episodes of depression does not inform us whether the mothers had depression before the postpartum period but this limitation could be overcome in future studies. In addition, by recruiting women attending health facilities, we may have missed women who do not utilize these services. They could be more prone to PPD. Women who do not attend postpartum services in a health facility setting are more likely to have postpartum check-ups with midwives in their neighborhoods. Village midwives could be a great asset in locating these types of women in future studies. The authors also used a wide precision gap of 0.09 which is the upper limit in order to target a smaller recruitment given the unpredictable timing of the covid-19 pandemic during data collection.

Implications and Recommendations

Screening for postpartum depression should be integrated into routine postpartum care in areas with high PPD prevalence. By routinely using the EPDS to screen mothers with PPD, the awareness of health care providers can improve early detection of postpartum depression. In turn this can lead to positive health outcomes for both mothers, babies and their families, which is an important goal of health care provision and promotion. In addition, incorporating PPD screening in the nursing-midwifery education curricular may be impactful.

This scale may also be validated in postpartum women living with HIV and antepartum mothers suffering from antepartum depression as this may increase the chances of identifying PPD at an early phase. Midwives, nurses, traditional birth attendants, family health practitioners and other primary health care workers can easily apply this screening scale and be encouraged to refer women suspected to have PPD to health facilities for further evaluation. This will ensure that most cases of PPD do not go undetected and untreated.

There is an urgent need for a better understanding of a feasibility study and acceptability study or survey of routine screening of postpartum women utilizing the validated EPDS in south western Uganda to provide appropriate support most especially during this pandemic period when depression is at a high rise.

Conclusion

From our study findings, overall, it can be concluded that the EPDS is a satisfactory instrument for screening for PPD and can be successfully used to screen postpartum depression at a cutoff score of ≥ 10 among southwestern Ugandan women attending routine postpartum check-up.

Abbreviations

AUC
Area under the curve
BHC-IV
Bwizibwera Health Centre IV
DSM-5
Diagnostic and Statistical Manual of Mental Disorders, 5th Edition
EPDS
Edinburgh Postnatal Depression Scale
HIV
Human Immunodeficiency Virus
KHC-IV
Kinoni Health Centre IV
MRRH
Mbarara Regional Referral Hospital
NPV
Negative Predictive Value
PPV
Positive Predictive Value
PPD
Postpartum Depression
ROC
Receiver Operating Characteristics
S_N
Sensitivity
S_P
Specificity

Declarations

Ethical Approval and Consent to Participate

Ethical approval was obtained from the Mbarara University of Science and Technology (MUST), Faculty Research Committee (FRC) and Research Ethics Committee (MUST-REC). After obtaining ethical approval, permission was sought from the hospital Director, Mbarara Regional Referral Hospital and the District Health Officers of Bwizibwera and Kinoni HCIV. The approval letters were then presented to Uganda National Council of Science and Technology (UNCST) for approval and further submitted to the head of department obstetrics and gynecology ward, MRRH, heads of departments, postnatal wards of Bwizibwera and Kinoni health center IVs, plus the Local Councils in Rwampara and Kashari County, Mbarara District.

The study adhered to the following key ethical principles: informed consent, confidentiality, and anonymity, voluntary participation, protection of participants from harm, trustworthiness, and transparency. Written informed consent was sought from all the participants and were identified by number and not their names. The findings from this study were stored in a computer secured with a password for purposes of confidentiality. For those mothers who were diagnosed with PPD, they were referred to the Mental Health Clinic for further clinical assessment and management. While administering the EPDS and the MINI 7.0.2, participants had immediate access to counseling services in the event that they triggered emotions that posed the participants' health and wellbeing.

Consent for publication

Not applicable

Availability of data and material

The data that support the findings of this study are available from the first and corresponding author, CA but restrictions apply under license for the current study.

Competing interests

The authors declare no competing interest.

Authors' contributions

CA conceived and designed the study. CA implemented the study and together with DA, they analysed the study findings. LB, GN and GZR supervised the study. CA, LB, GN, NJ, DA and GZR interpreted study results: CA wrote the first draft of the manuscript. CA, LB, GN, NJ, DA and GZR reviewed and corrected the draft manuscript. All authors read and approved the final manuscript.

References

1. Letourneau NL, Dennis C-L, Benzies K, Duffett-Leger L, Stewart M, Tryphonopoulos PD, et al. Postpartum depression is a family affair: addressing the impact on mothers, fathers, and children. Issues Ment Health Nurs. 2012;33(7):445–57.

2. Cox JL, Chapman G, Murray D, Jones P. Validation of the Edinburgh Postnatal Depression Scale (EPDS) in non-postnatal women. J Affect Disord. 1996;39(3):185–9.

3. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression: development of the 10-item Edinburgh Postnatal Depression Scale. Br J psychiatry. 1987;150(6):782–6.

4. Hewitt C, Gilbody S, Brealey S, Paulden M, Palmer S, Mann R, et al. Methods to identify postnatal depression in primary care: an integrated evidence synthesis and value of information analysis. NIHR Health Technology Assessment programme: Executive Summaries; 2009.

5. Cox J. Thirty years with the Edinburgh Postnatal Depression Scale: voices from the past and recommendations for the future. Br J Psychiatry. 2019;214(3):127–9.

6. Cox J, Holden J, Henshaw C. Perinatal Mental Health: The Edinburgh Postnatal Depression Scale (EPDS) Manual. 2nd ed.: RCPsych publications; 2014.

7. Beck CT, Gable RK. Further validation of the postpartum depression screening scale. Nurs Res. 2001;50(3):155–64.

8. Buist A, Condon J, Brooks J, Speelman C, Milgrom J, Hayes B, et al. Acceptability of routine screening for perinatal depression. J Affect Disord. 2006;93(1–3):233–7.

9. Gibson J, McKenzie-McHarg K, Shakespeare J, Price J, Gray R. A systematic review of studies validating the Edinburgh Postnatal Depression Scale in antepartum and postpartum women. Acta psychiatrica Scandinavica. 2009;119(5):350–64.

10. Khalifa DS, Glavin K, Bjertness E, Lien L. Determinants of postnatal depression in Sudanese women at 3 months postpartum: a cross-sectional study. BMJ open. 2016;6(3):e009443.

11. 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. Arch Women Ment Health. 2010;13(3):201–6.

12. 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 Childbirth. 2016;16(1):1–19.

13. Atuhaire C, Brennaman L, Cumber SN, Rukundo GZ, Nambozi G. The magnitude of postpartum depression among mothers in Africa: a literature review. The Pan African Medical Journal. 2020;37.

14. Atuhaire C, Rukundo GZ, Nambozi G, Ngonzi J, Atwine D, Cumber SN, et al. Prevalence of postpartum depression and associated factors among women in Mbarara and Rwampara districts of south-western Uganda. BMC Pregnancy and Childbirth. 2021;21(1).

15. Chorwe-Sungani G, Chipps J. A systematic review of screening instruments for depression for use in antenatal services in low resource settings. BMC Psychiatry. 2017;17(1):1–10.

16. e Couto TC, Brancaglion MYM, Alvim-Soares A, Moreira L, Garcia FD, Nicolato R, et al. Postpartum depression: A systematic review of the genetics involved. World J psychiatry. 2015;5(1):103.

17. Benvenuti P, Ferrara M, Niccolai C, Valoriani V, Cox JL. The Edinburgh postnatal depression scale: validation for an Italian sample. J Affect Disord. 1999;53(2):137–41.

18. Rahman A, Iqbal Z, Harrington R. Life events, social support and depression in childbirth: perspectives from a rural community in the developing world. Psychol Med. 2003;33(7):1161.

19. Cox J. Use and misuse of the Edinburgh Postnatal Depression Scale (EPDS): a ten point 'survival analysis'. Springer; 2017.

20. Cox JL, Holden J, Henshaw C. Perinatal mental health: the Edinburgh postnatal depression scale (EPDS) manual: RCPsych publications London:; 2014.

21. Kozinszky Z, Dudas RB. Validation studies of the Edinburgh Postnatal Depression Scale for the antenatal period. J Affect Disord. 2015;176:95–105.

22. Buderer NMF. Statistical methodology: I. Incorporating the prevalence of disease into the sample size calculation for sensitivity and specificity. Acad Emerg Med. 1996;3(9):895–900.

23. Khalifa DS, Glavin K, Bjertness E, Lien L. Postnatal depression among Sudanese women: prevalence and validation of the Edinburgh Postnatal Depression Scale at 3 months postpartum. Int J women's health. 2015;7:677.

24. Tesfaye M, Hanlon C, Wondimagegn D, Alem A. Detecting postnatal common mental disorders in Addis Ababa, Ethiopia: validation of the Edinburgh postnatal depression scale and Kessler scales. J Affect Disord. 2010;122(1–2):102–8.

25. First M, Williams J, Karg R, Spitzer R. Structured clinical interview for DSM-5—Research version (SCID-5 for DSM-5, research version; SCID-5-RV). Arlington, VA: American Psychiatric Association. 2015:1–94.

26. Hung KJ, Tomlinson M, le Roux IM, Dewing S, Chopra M, Tsai AC. Community-based prenatal screening for postpartum depression in a South African township. Int J Gynaecol Obstet. 2014;126(1):74–7.

27. Chinawa JM, Odetunde OI, Ndu IK, Ezugwu EC, Aniwada EC, Chinawa AT, et al. Postpartum depression among mothers as seen in hospitals in Enugu, South-East Nigeria: an undocumented issue. Pan African Medical Journal. 2016;23(1).

28. Rogathi JJ, Manongi R, Mushi D, Rasch V, Sigalla GN, Gammeltoft T, et al. Postpartum depression among women who have experienced intimate partner violence: A prospective cohort study at Moshi, Tanzania. J Affect Disord. 2017;218:238–45.

29. Madeghe BA, Kimani VN, Vander Stoep A, Nicodimos S, Kumar M. Postpartum depression and infant feeding practices in a low income urban settlement in Nairobi-Kenya. BMC Res Notes. 2016;9(1):506.

30. 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. J Affect Disord. 2009;113(1–2):109–17.

31. Uwakwe R. Affective (depressive) morbidity in puerperal Nigerian women: validation of the Edinburgh Postnatal Depression Scale. Acta psychiatrica Scandinavica. 2003;107(4):251–9.

32. Hanlon C, Medhin G, Alem A, Araya M, Abdulahi A, Hughes M, et al. Detecting perinatal common mental disorders in Ethiopia: validation of the self-reporting questionnaire and Edinburgh Postnatal Depression Scale. J Affect Disord. 2008;108(3):251–62.

33. Levis B, Negeri Z, Sun Y, Benedetti A, Thombs BD. 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.

34. Kakyo TA, Muliira JK, Mbalinda SN, Kizza IB, Muliira RS. Factors associated with depressive symptoms among postpartum mothers in a rural district in Uganda. Midwifery. 2012;28(3):374–9.
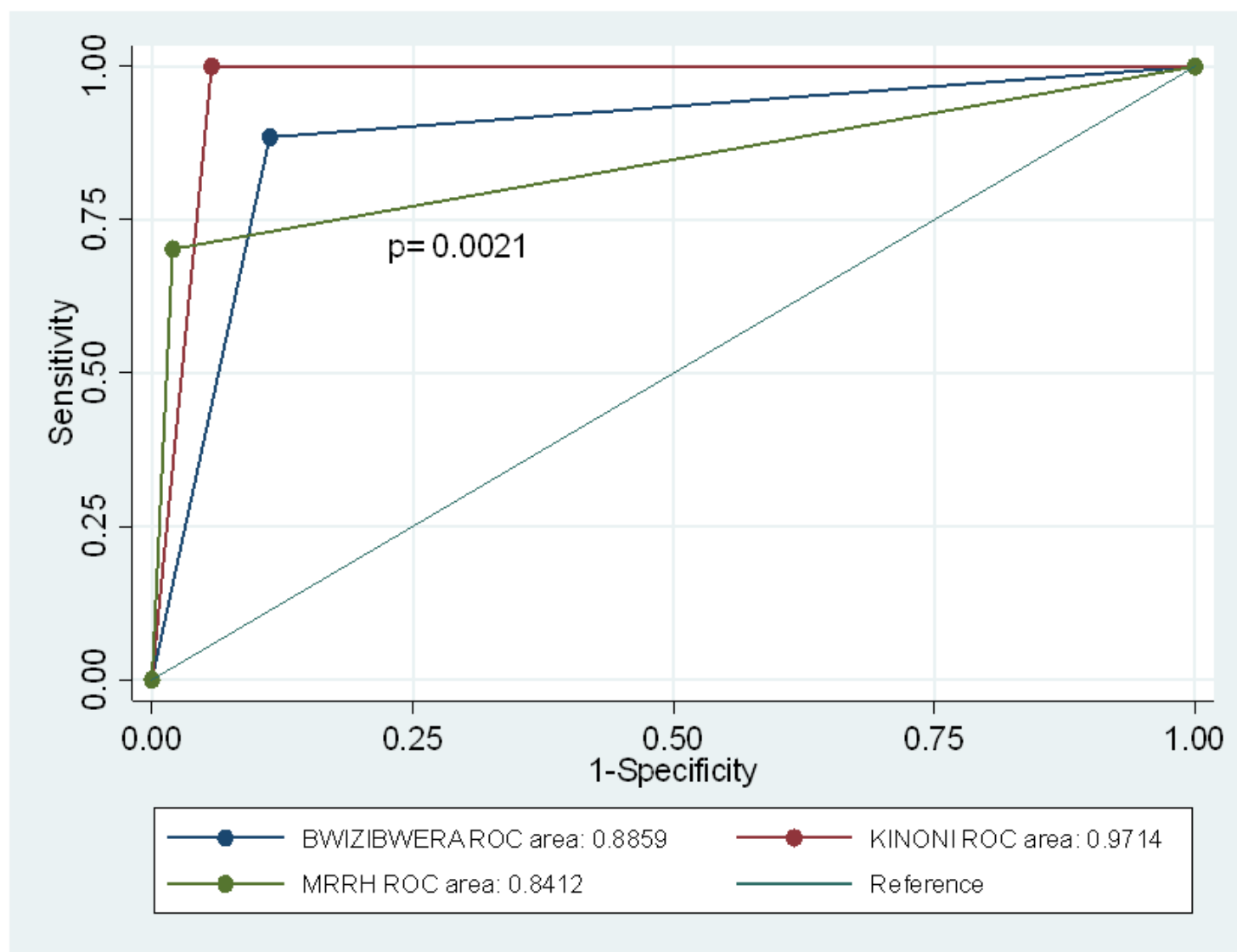
Figures

Figure 1

Graph comparing Area under the ROC for EPDS versus the MINI 7.0.2 in screening for PPD across different health facilities