Detecting Maternal Depression in a Low-Income Country: Comparison of the Self-Reporting Questionnaire and the Edinburgh Postnatal Depression Scale

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Summary

Objective: To validate the Self-Reporting Questionnaire (SRQ-20) and the Edinburgh Postnatal Depression Scale (EPDS) against the Clinical Interview Schedule-Revised (CIS-R).
Design: Two-phase design.
Subjects and methods: 664 mothers were approached, 601 of them completed the EPDS and SRQ questionnaires. The CIS-R was administered to confirm the diagnosis for depression. The diagnostic accuracy was compared using the receiver operating characteristic analysis.
Results: At the threshold of 11, the SRQ had better sensitivity, negative predictive values and positive predictive values compared with the EPDS optimal threshold of 14.
Conclusion: Both measures (EPDS and SRQ) have adequate validity to screen for depression in mothers in Pakistan. However, the SRQ performed better, with participants finding it easy to understand. The scales can be of great value to detect maternal depression in primary care and pediatric settings in low-income countries.

Key words: depression, validation studies, developing countries, self-reporting questionnaire, Edinburgh postnatal depression scale, culture.

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Introduction
Depression is known to be the second most disabling condition projected for the year 2020; however, for women in developing countries, it is the number one cause of disability [1,2]. In particular, women of Pakistani origin have been found to have a high prevalence of depression, with it being linked to limited social support, socioeconomic climate and issues with relationships [3–5].

Postnatal depression (PND) in women manifests in the first 3 months after child birth, and there are reports that 10–15% of women in Western societies experience PND [6,7]; however, the rates in developing countries are as high as 34.7% [8–10]. Further research has indicated that depression in mothers can extend to the later maternal stages (up to 36 months), with it having a profound negative effect on infant care and child psychological development [11]. Due to the many stressors that occur during the maternal phase like that of lack of sleep, changes in routine and isolation, depression is often not detected, and therefore, there is a need for robust measures and instruments that can effectively be used in a primary care setting.

Measures that detect depression are not only useful for mental health professionals; they can also be useful for other medical practitioners who deal with children. Such medical practitioners could be pediatricians, who are in an ideal position to detect and diagnose maternal depression, as mothers are usually present with their children. Pediatricians can be an adequate source of help for mothers who suffer from depression and may provide an opportunity for additional care for the treatment of depression. However, the diagnosis often gets missed due to it not adequately being detected [12].

The Self-Reporting Questionnaire (SRQ) is a screening questionnaire that was developed by the World Health Organization [13] and is often used to detect depression in mothers [9,14]. It has also been shown to be valid after being translated into the Urdu language [15]. The Edinburgh Postnatal Depression Scale (EPDS) [16] is another screening tool often used to detect depression in mothers. It has been found to have excellent sensitivity and specificity in diagnosing PND [16]. The SRQ and EPDS have been used and validated in Pakistan [9,14]; however, we are not aware of any published validation report of the SRQ and EPDS in Pakistani women with pre-school children.

This study aims to investigate the validity and suitability of the SRQ and EPDS to detect depression in low-income mothers with pre-school children in Karachi, Pakistan.

Method

Study area and subjects
Pakistan has a population exceeding 170 million and is the sixth most populous country in the world [17]. Karachi is the biggest city of Pakistan with a population of more than 15 million people [17]. This study was conducted in low-income, urban slum areas of Karachi. The study consisted of physically healthy mothers having a child aged between 0 and 36 months. The women were included if they were within the age range of 17–40 years; not suffering from any medical illness, learning disability, postpartum or other form of psychosis and were not receiving any psychiatric care. Mothers were excluded from the study if they had a child with any serious medical or psychiatric illness.

Procedure
The study was given ethical approval by the Research Ethics Committee of the Pakistan Institute of Learning and Living and the Dow University of Health Sciences. Research assistants were trained on how to administer the questionnaires used in the study. Written informed consent was obtained from all the participants.

Data ascertainment
The study used a two-phase design. In the first phase, mothers were screened with the SRQ and the EPDS. The questionnaires were administered on each mother by the same research assistant on the same day to avoid any effect of day-to-day variation in mood on scores. Instructions and questions were read out by research assistants and they waited for the mother’s responses before moving to the next question. Of the 664 mothers approached, 601 mothers completed the EPDS and the SRQ. Twenty-three mothers refused to participate in the study and the other 40 who did not take part had missing items on the SRQ or the EPDS. In the second phase, all the participating mothers were then interviewed using the Clinical Interview Schedule-Revised (CIS-R) to confirm the diagnosis of depression. The CIS-R was completed on the same day as the SRQ and the EPDS. The interviewers were blind to scores of EPDS and SRQ.

Measures

Self-Reporting Questionnaire. The World Health Organization’s SRQ-20 [13] was administered to assess maternal psychological distress. This questionnaire consists of 20 items and each question has a dichotomous (yes/no) response with each item being scored as 0 or 1. The maximum score for the SRQ is 20 and it inquires about symptoms over the past 30 days. The higher the SRQ score the greater the distress. SRQ has been validated in Pakistan in our previous study [3].

Edinburgh Postnatal Depression Scale. The EPDS [16] was used to screen for maternal depression. EPDS consists of 10 self-report items rated on a
0–3 scale. The higher the EPDS score the greater the severity of depression. The EPDS has been used in our earlier studies [10,14], and it has been validated with the Pakistani population [18].

Clinical Interview Schedule-Revised. The CIS-R [19] is a diagnostic structured interview and was used to confirm the International Classification of Diseases-10th Revision diagnosis of depression. The CIS-R has been used previously in a trial with British women of Pakistani origin to confirm diagnosis of depression [20].

Statistical analysis
To estimate the optimal threshold score, Receiver Operating Characteristic (ROC) analysis was used. ROC analysis compared the ability of EPDS and SRQ to discriminate between cases and non-cases. Performance indices included sensitivity, specificity, positive predictive value (PPV), negative predictive value and percentage agreement. These performance indices were calculated using the best cut-off determined by the ROC analysis. To assess the effects of sociodemographic variables on misclassification by questionnaire, the odds ratio of being a false-negative among cases and of being false-positive among non-cases were calculated using Fisher’s exact test.

Results
ROC analysis was applied to the two screening instruments. The ROC curve for the SRQ shows the value for the ROC area under the curve of 0.87 (95% confidence interval: 0.84–0.90) (Figure 1).

The corresponding value for EPDS is 0.85 (95% confidence interval: 0.81–0.89) (Figure 2). The values can range from 0.5 (ability to discriminate case from non-case no better than chance) to 1.0 (which is perfect discrimination).

Validity coefficients for various thresholds of two screening instruments were computed. Table 1 and Table 2 give a range of SRQ and EPDS thresholds along with the corresponding values of sensitivity (i.e. the proportion of depressed women correctly identified) and specificity (i.e. the proportion of non-depressed women correctly identified) as well as the PPV (i.e. the proportion of women identified as depressed who are truly depressed) and negative predictive value (i.e. the proportion of women identified as non-depressed who are truly non-depressed) of the questionnaires.

Table 1 shows that at a lower cut-off of 6, the SRQ has excellent sensitivity, i.e. 100% with 68% PPV, but has much lower value for specificity, i.e. 31%. Similarly, the EPDS (Table 2) has 100% sensitivity at cut-off point of 6, but has lower specificity, i.e. 34%. At cut-off point of 11, the SRQ correctly identifies 84% of mothers with depression, with specificity of 74%. In comparison, the EPDS at a cut-off point of 14 correctly identifies 79% of women with depression, with specificity of 74%.

Discussion
This study demonstrated that both the SRQ and EPDS are useful screening instruments to detect depression in women with little or no education. Both scales have good sensitivity and specificity when being assessed against the criterion of the CIS-R. However, for this population, the SRQ has better diagnostic accuracy when compared with the EPDS. The study established an ideal cut-off for the SRQ to be 11, where it has a sensitivity of 84% and a PPV of 83%. Whereas the ideal cut-off for the EPDS was found to be 14; at this cut-off point, the EPDS has a sensitivity of 79% and a PPV of 82%.
The SRQ was well accepted by the participants, with questions being easily understood and completed by the participants. Even individuals with little or minimal education were able to answer the questions with relative ease. The instrument was also found to be easy to administer by the research team. However, the EPDS was found to be a little complex to understand and administer when compared with the SRQ, which appears to be more suitable to the study population due to its simplicity and it being a dichotomous scale, a finding similar to that reported by Rahman et al [18].

In a translated version of the SRQ developed by Scholte et al [21], the research has established that the SRQ is considered to be a good screening measure, with it obtaining good reliability scores when being used with women in developing countries [21,22]. Using the Urdu version of the SRQ-20 may have allowed the participants to understand and more adequately relate to the questions, illustrating the importance of appropriately translated measures. In line with research from other developing countries, we recommend a high cut-off point for the SRQ to effectively screen for maternal depression.

Rahman et al [18] conducted a study to compare effectiveness of SRQ and EPDS for screening PND and found that at a cut-off point of 7/8, SRQ has a sensitivity value of 81% and a specificity of 65.1% with PPV of 47. In contrast, results from the present study have suggested a higher cut-off point, i.e. 11, to achieve greater sensitivity and specificity. Rahman et al [18] suggested that for routine assessment, higher cut-off point of 9/10 is more preferable, as women experience more physical symptoms during postnatal period and the SRQ contains many items regarding somatic symptoms. The Bradford Somatic Inventory has previously been used to assess depression in developing countries [23]. In a study comparing the Bradford Somatic Inventory with the SRQ, it was found that an optimal cut-off for SRQ was 7/8, with a sensitivity of 78% and a specificity of 81%. The study concluded that although both scales were effective screening instruments, the SRQ was more versatile [24].

The EPDS is a widely used tool in developing countries, with many studies having used a cut-off point of 10/11 [25,26]. Cox et al [27] however suggested a cut-off value of 12/13 as a recommended threshold in primary care settings to ensure accuracy of the EPDS to detect depression. We found a higher cut-off point of 14 to be most appropriate to this study population, as it generated high sensitivity, specificity and PPV values.

One limitation of this study is the modest sample size. Also, participants were from one urban geographical area and may not be generalizable to the other areas of Pakistan like the rural population. Future research should be carried out with different groups in Pakistan, including the rural population with even lower literacy levels. In addition, the study ascertained that the SRQ and the EPDS were effective screening measure. However, it has to be highlighted that the SRQ and EPDS are screening instruments and do not infer specific psychiatric diagnosis. Furthermore, the difference in number of items in these instruments needs to be considered when making comparisons between the measures.

### Conclusion

To our knowledge, this is the first study to look at validation of the SRQ and the EPDS in Pakistani women with pre-school children. Both psychiatric measures were found to be equally effective in detecting maternal depression; however, the SRQ is preferred due to its simpler format and higher sensitivity and specificity. Considering the high rates of depression in Pakistan, the scales can be of great value and importance in primary care and pediatric settings.

### References