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Detection of Postnatal Depression

Development of the 10-item Edinburgh Postnatal Depression Scale

J. L. COX, J. M. HOLDEN and R. SAGOVSKY

The development of a 10-item self-report scale (EPDS) to screen for Postnatal Depression in the community is described. After extensive pilot interviews a validation study was carried out on 84 mothers using the Research Diagnostic Criteria for depressive illness obtained from Goldberg's Standardised Psychiatric Interview. The EPDS was found to have satisfactory sensitivity and specficity, and was also sensitive to change in the severity of depression over time. The scale can be completed in about 5 minutes and has a simple method of scoring. The use of the EPDS in the secondary prevention of Postnatal Depression is discussed.

In the last decade several studies (Paykel *et al*, 1980; Cox *et al*, 1982; Kumar & Robson, 1984; O'Hara *et al*, 1984; Watson *et al*, 1984) have provided substantial confirmation for the earlier finding of Pitt (1968) that the months following childbirth are frequently characterised by psychiatric disorder, and that at least 10–15% of mothers experience a marked depressive illness at this time.

Furthermore, the results of a follow-up study showed that postnatal depression was usually accurately recalled by the mothers 3 years later; and that at least half of the depressed mothers had not recovered by the end of the first postpartum year (Cox *et al*, 1984). The finding that the children of such depressed mothers may show behaviour disturbance at 3 years (Wrate *et al*, 1985) or cognitive defects at 4 years (Cogill *et al*, 1986) suggests that postnatal depression may have a long-term negative impact on the family.

In our earlier study (Cox *et al*, 1982), we found that 13 of the 101 women interviewed had a marked post-natal depressive illness and yet the majority of these depressed mothers had not received any sustained treatment from their primary care workers nor had they been referred to a psychiatrist; the three women who had been referred were not those who were depressed. This failure to identify depression in the puerperium, especially when such mothers were usually known to their GP, Community Midwife or Health Visitor, was obviously a cause for much clinical concern.

A further difficulty in identifying depressed mothers is that screening scales for depression appear to have a number of limitations when used on childbearing women. In our earlier study from Edinburgh, for example, the Anxiety and Depression Scale (SAD) of Bedford & Foulds (1978) was found to have uncertain validity; of the 13 pregnant women who scored 6+ (Foulds' threshold for personal illness) only three had any form of psychiatric disorder, while four had minor symptoms only and six had no psychiatric illness whatsoever (Cox *et al*, 1983). The 30-item General Health Questionnaire of Goldberg *et al* (1970) has been assessed by Nott & Cutts (1982) for possible use in the puerperium and was also found to require some slight modifications. These authors reported that 89 (45%) of 200 puerperal women scored highly on the 30-item GHQ, but only 37 (18%) were found to be psychiatric cases. Similar difficulties with the Beck Depression Inventory (Beck *et al*, 1961) for use in identifying depression in the puerperium were reported by O'Hara *et al* (1983). In this study only 11 of the 19 women who scored above the cut-off score fulfilled Research Diagnostic Criteria (RDC) for Depression, and of the 23 who scored below the cut off there were four false negatives. Furthermore, the finding that measures of self control predicted postnatal depression as measured by the Beck Scale were not confirmed when a clinical syndrome diagnosis of depression was made using Research Diagnostic Criteria suggests that studies using this scale as the only measure of depression following childbirth may give misleading results (O'Hara *et al*, 1984).

The possible explanation for these apparent limitations of well established scales when used on childbearing women include their emphasis on the somatic symptoms of psychiatric disorder which may be caused by normal physiological changes associated with childbearing, as well as the reluctance of community workers to use questionnaires which may be regarded as time-consuming or which

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appear to lack face validity. These limitations may also be relevant to a consideration of the Zung Depression Scale (Zung, 1965) for use in the puerperium.

To be useful as a screening test for depression following childbirth, therefore, a self-report scale must be fully acceptable to women who may not regard themselves as unwell, or as in need of medical help. The scale needs also to be simple to complete, and not require the health worker to have any specialist knowledge of psychiatry. It must have satisfactory reliability and validity.

Furthermore, Williams *et al* (1980) have appropriately emphasised that rating scales which had been validated on hospital samples must be revalidated if they are used in community populations where the differences between psychiatric illness and normality is often less distinct. The earlier work of Snaith (1981, 1983) in this regard was also important, as he clearly recognised the need to modify existing scales of depression for use in new specific clinical situations and in particular was aware of the need to develop a screening questionnaire to detect postnatal depression. Others, such as Kumar (1982) and Cox *et al* (1983), had also emphasised that this task was an important current research priority.

Spurred on by these observations of our colleagues as well as by the pressing need for primary care workers to have practical help in identifying postnatal depression, we therefore decided to develop a self-report scale to detect mothers who were depressed following childbirth.

Method

A detailed analysis of the suitability of the Irritability, Depression and Anxiety Scale (IDA) (Snaith *et al*, 1978), the Hospital Anxiety and Depression Scale (HAD) (Zigmond & Snaith, 1983), and the Anxiety and Depression Scale of Bedford & Foulds (1978) was carried out and we eventually selected 21 items, including several of our own construction, which we thought to be appropriate for the detection of postnatal depression. These items were then tested during extensive pilot interviews with mothers of young babies. The detailed wording of items, their acceptability to mothers and health workers, as well as their likelihood of detecting postnatal depression was then carefully evaluated. Thirteen items were eventually selected as being those most likely to detect postnatal depression; seven of these were items constructed by ourselves and the other six were adapted from the IDA and the HAD.

The validity of this 13-item scale was then established on a sample of 63 purperal women who attended a health centre in Livingston (see Cox, 1986 for details). This study showed that these 13 items distinguished clearly between depressed and non-depressed women, although a rotated factor analysis revealed that the two items from the irritability subscale of the IDA, together with an item concerning the enjoyment of motherhood, formed a separate 'non-depression' factor; this latter finding providing confirmation of Snaith's earlier observation that irritability was often identified as a separate mood from depression and anxiety. As this analysis of our data had suggested that the specificity of the scale might be increased by omitting these three items, we decided to carry out a further validation study using only the 10 items which were more clearly related to depression. This 10-item scale would also have the advantage of taking less time to complete.

The validation study of the 10-item EPDS to be reported in this paper was carried out on 84 mothers living in Edinburgh or at Livingston new town. Most of the mothers, who were taking part in a study to determine the effectiveness of counselling by health visitors in the treatment of postnatal depression, had been identified by their health visitors at about 6 weeks following delivery as being potentially depressed. The health visitors had been asked to indicate whether, in their opinion, these mothers were 'normal', 'depressed', or were considered as having 'problems'. As we envisaged that a useful function of the scale would be to confirm the diagnosis of depression in women already suspected by their primary care worker as being possibly depressed, this sample was particularly appropriate. We also considered it important to determine whether the scale would satisfactorily identify postnatal depression when it was administered in a domestic environment. The mother's home was, therefore, an optimum setting in which to validate the 10-item scale; home visits by health visitors being regarded as an important link between the assessment of puerperal mothers and other members of the primary care team. Mothers in our sample were interviewed by R.S. using Goldberg's Standardised Psychiatric Interview (SPI) (Goldberg *et al*, 1970) and the majority of such interviews took place in the mothers own home (SPI-1). At this home visit the EPDS was first completed by the mother and was then placed in a sealed envelope so that the interviewer remained blind to the score while subsequently administering the SPI. To prevent any possible bias effect caused by the interviewer knowing that the subject may have been regarded by the health visitor as being 'depressed' or as having problems, 12 normal women were also included in the sample. The criteria used for the diagnosis of a depressive illness were the Research Diagnostic Criteria of Spitzer *et al* (1975). Mothers who were observed to have a depressed mood but who did not meet full RDC criteria for depression were, however, also separately identified. As recruitment of subjects into the study was slower than expected, a further 12 women were interviewed by J.C. at a local health clinic. Both interviewers had been trained in the use of the SPI and difficult ratings were jointly discussed. The validation of the 10-item EPDS was determined for the total sample by comparing the EPDS scores with the RDC clinical diagnosis of depression.

Results

Validation sample

The mean age of women was 26 years, and that of their babies was 3 months. Seventy-five percent had had normal

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deliveries, 15% Caesarian sections and a further 10% had forceps delivery. The majority (81%) were married, whilst 13% had a permanent partner. Only 6% were single parents. Social class distribution (according to husband's, or partner's occupation where one was present, or according to the mother's previous occupation in the case of single parents) was as follows: Social Class II:7%, III:35%, IV:31%, V:27%.

Validation of the 10-item EPDS

The results of the validation of the 10-item EPDS are shown in Fig. 1.

A threshold score of 12/13 was found to identify all of the 21 women with an RDC diagnosis of Definite Major Depressive Illness and two of the three women with Probable Major Depressive Illness. Four of the 11 women with Definite Minor Depression were false negatives, i.e. they scored 12 or below, and there were 11 'false positives', although six of these 11 women had depressive symptoms but did not meet full Research Diagnostic Criteria for depression. The subject with the highest false positive score (21) had a marked personality disorder; while the three women with a psychiatric diagnoses other than depression all scored below the cut-off.

The sensitivity of the EPDS, the proportion of RDC depressed women ($n=35$) who were true positives ($n=30$), was 86%; the specificity, proportion of non-depressed women ($n=49$) who were true negatives ($n=38$), was 78%. The positive predictive value, the proportion of women above threshold on the EPDS ($n=41$) who met RDC criteria for depression ($n=30$), was 73%. As it is important in some clinical or research settings for actual cases of depression not be missed, our data suggest that the failed detection of cases can be reduced to under 10% with a cut-off score of 9/10.

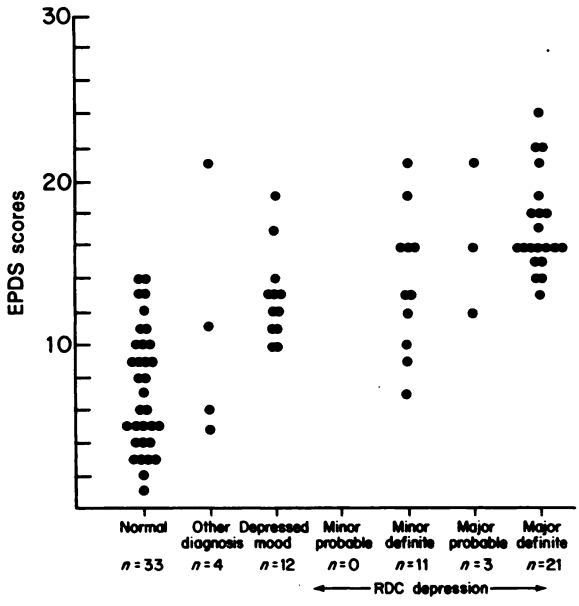


FIG. 1 Validation of Edinburgh Postnatal Depression Scale.

When analysis of our data was carried out on only those women ($n=60$) interviewed by R.S. (excluding the 12 women with no previously identified problems, as well as the 12 subjects interviewed by J.C. at the Health Centre) the optimum threshold score was almost the same as in the larger sample, sensitivity 85%, specificity 77%, the positive predictive value having increased to 83%. The split-half reliability of the scale was found to be 0.88, and the standardised α-coefficient 0.87.

Sensitivity to change in the severity of depression over time was also established on a subsample by comparing the EPDS score at the first interview (EPDS-1), when mothers were taken into the counselling intervention study, with that obtained at the 11-week follow-up interview. At this second home interview the EPDS was completed for a second time (EPDS-2), and a repeat SPI (SPI-2) was carried out, the interviewer again remaining blind to both the EPDS-1 and the EPDS-2 scores.

Analysis of this data showed that those mothers who were depressed according to RDC criteria at both interviews ($n=15$), showed no significant difference between their EPDS-1 (16.5) and EPDS-2 (15.38) mean scores on these two occasions, whereas mothers who were depressed at Interview 1 but not at Interview 2 ($n=16$) had a reduction of score between EPDS-1 and EPDS-2 which was highly significant. (EPDS-1 mean score = 15.8, EPDS-2 mean score = 9.8, $t=3.72$, $P=0.002$). The EPDS-2 score in all but one subject fell to below the threshold of 12/13; the mother whose EPDS-2 score increased, but who was not depressed, had a probable cancer of the cervix and was diagnosed as having an anxiety neurosis.

Analysis of the possible influence on the EPDS score of another family member being present when the scale was completed suggested that under these circumstances women tended either to exaggerate, or to minimise, their psychiatric problems. Thus three subjects who had the highest 'false positive' score, and three of the four 'false negatives', had not been alone when they were interviewed.

Discussion

Our study has shown that the 10-item Postnatal Depression Scale, which was derived from the earlier work of Snaith, had satisfactory validity, split-half reliability and was also sensitive to changes in the severity of depression over time. Furthermore, we found that the scale was fully acceptable to the child-bearing women and was usually completed within 5 minutes. The simple method of scoring was an advantage and the health visitors recognised that the scale would greatly assist them in the detection of mothers who were depressed postpartum.

We believe it to be a substantial advantage that this validation study of the 10-item scale was carried out in a community setting and on women who were

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as close as possible to mothers regarded by their primary care workers as having problems. Our data nevertheless suggested that sensitivity and specificity of the scale may be increased if it is completed when other family members are not present.

It seems likely that the scale will be useful in the routine work of community health workers (e.g. health visitors, community psychiatric nurses and General Practitioners) and assist to identify postnatal depression in mothers thought by their health worker to be at risk. It may also be of use in treatment studies of postnatal depression when carried out on mothers living in the community.

Our data suggested that women who scored above a threshold of 12/13 were most likely to be suffering from a depressive illness of varying severity, and should therefore be further assessed by the primary care worker to confirm whether or not clinical depression is present. The EPDS is not a substitute for this clinical assessment, and a score just below the cut-off should not be taken to indicate the absence of depression, especially if the health professional has other reasons to consider this diagnosis. Our data also suggest that a threshold of 9/10 might be appropriate if the scale was considered for routine use by primary care workers.

We now plan to validate the scale for possible use during pregnancy and also to determine its usefulness in other populations. The scale could, for example, be administered by a computer at a mother's visit to an antenatal or postnatal clinic, and it may be useful as a more general screening scale for depressive illness. The revalidation of the scale for use in these other clinical settings must be carried out, however, before this wider use is recommended.

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Appendix
Edinburgh Postnatal Depression Scale (EPDS)

The Edinburgh Postnatal Depression Scale (EPDS) has been developed to assist primary care health professionals to detect mothers suffering from postnatal depression; a distressing disorder more prolonged than the 'blues' (which occur in the first week after delivery) but less severe than puerperal psychosis.

Previous studies have shown that postnatal depression affects at least 10% of women and that many depressed mothers remain untreated. These mothers may cope with their baby and with household tasks, but their enjoyment of life is seriously affected and it is possible that there are long-term effects on the family.

The EPDS was developed at health centres in Livingston and Edinburgh. It consists of ten short statements. The mother underlines which of the four possible responses is closest to how she has been feeling during the past week. Most mothers complete the scale without difficulty in less than 5 minutes.

The validation study showed that mothers who scored above a threshold 12/13 were likely to be suffering from a depressive illness of varying severity. Nevertheless the EPDS score should *not* override clinical judgement. A careful clinical assessment should be carried out to confirm the diagnosis. The scale indicates how the mother has felt *during the previous week*, and in doubtful cases it may be usefully repeated after 2 weeks. The scale will not detect mothers with anxiety neuroses, phobias or personality disorders.

Instructions for users

1. The mother is asked to underline the response which comes closest to how she has been feeling in the previous 7 days.
2. All ten items must be completed.
3. Care should be taken to avoid the possibility of the mother discussing her answers with others.
4. The mother should complete the scale herself, unless she has limited English or has difficulty with reading.
5. The EPDS may be used at 6–8 weeks to screen postnatal women. The child health clinic, postnatal check-up or a home visit may provide suitable opportunities for its completion.

EDINBURGH POSTNATAL DEPRESSION SCALE (EPDS)

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Name:
Address:
Baby's age:

As you have recently had a baby, we would like to know how you are feeling. Please UNDERLINE the answer which comes closest to how you have felt IN THE PAST 7 DAYS, not just how you feel today.

Here is an example, already completed.
I have felt happy:
Yes, all the time
Yes, most of the time
No, not very often
No, not at all
This would mean: "I have felt happy most of the time" during the past week. Please complete the other questions in the same way.

In the past 7 days:

1. I have been able to laugh and see the funny side of things
   As much as I always could
   Not quite so much now
   Definitely not so much now
   Not at all
2. I have looked forward with enjoyment to things
   As much as I ever did
   Rather less than I used to
   Definitely less than I used to
   Hardly at all
* 3. I have blamed myself unnecessarily when things went wrong
   Yes, most of the time
   Yes, some of the time
   Not very often
   No, never
4. I have been anxious or worried for no good reason
   No, not at all
   Hardly ever
   Yes, sometimes
   Yes, very often
* 5. I have felt scared or panicky for no very good reason
   Yes, quite a lot
   Yes, sometimes
   No, not much
   No, not at all
* 6. Things have been getting on top of me
   Yes, most of the time I haven't been able to cope at all
   Yes, sometimes I haven't been coping as well as usual
   No, most of the time I have coped quite well
   No, I have been coping as well as ever
* 7. I have been so unhappy that I have had difficulty sleeping
   Yes, most of the time
   Yes, sometimes
   Not very often
   No, not at all
* 8. I have felt sad or miserable
   Yes, most of the time
   Yes, quite often
   Not very often
   No, not at all
* 9. I have been so unhappy that I have been crying
   Yes, most of the time
   Yes, quite often
   Only occasionally
   No, never
*10. The thought of harming myself has occurred to me
   Yes, quite often
   Sometimes
   Hardly ever
   Never

Response categories are scored 0, 1, 2, and 3 according to increased severity of the symptom.
Items marked with an asterisk are reverse scored (i.e. 3, 2, 1 and 0). The total score is calculated by adding together the scores for each of the ten items.
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