The Primary Care Anxiety and Depression (PCAD) Scale: a culture-oriented screening scale


The construction of a screening scale for states of anxiety and depression among primary health care (PHC) patients is described. Most of the scale items were selected from a pool of items chosen from two international screening scales which were validated locally, namely the Self-Reporting Questionnaire (SRQ-20) and the Hospital Anxiety and Depression (HAD) Scale. A validity study of a new sample of PHC patients indicated that the scale provided a valid measure of anxiety and depressive states, and was closely correlated with the psychiatrist’s clinical judgement. The scale correlated more strongly with the psychiatrist’s clinical judgement than the general practitioners’ assessments. Two cut-off points were established, one of which is more appropriate for clinical use and the other for prevalence estimation. The former threshold of the scale could be used to alert the busy general practitioner to the possibility that clinically significant anxiety or depression may be present.

Introduction

Early surveys of psychiatric morbidity in primary health care (PHC) settings in the UK were conducted in the 1960s (1, 2). Recent studies have shown that more than one-third of consecutive primary care attenders show substantial levels of psychological distress, and that approximately 15–25% of them can be assigned a specific diagnosis of depression or anxiety (3–7). There is growing evidence that the majority of psychiatric morbidity presents at primary care level, and that only a small proportion of this is passed on to the psychiatric services. The data pertaining to this issue vary considerably depending on the case-finding methods employed (8, 9). However, Fahy has reported that only 17% of general practice depressives are ultimately referred to psychiatrists (10).

Shepherd et al. observed very wide variation in the rates of psychiatric morbidity reported by general practitioners in London (2). Marks et al. reported that the average proportion of patients identified as psychiatrically ill was 31.1% (range 3–77%) (11). However, less variation in morbidity is observed if screening tests or interview methods are used, suggesting that the variation in reported rates is related to observer bias (12). Studies designed to investigate the sources of this variation among general practitioners identified factors related to both the patient and the doctor, e.g. sociodemographic factors, the number of patients joining and leaving the practice list, inadequate psychiatric training of doctors, and doctors’ attitudes (2, 8).

Emotional disorders encountered in PHC patients may be related to physical disability, and somatic symptoms may be a manifestation of anxiety or depressive states with no basis in organic pathology. However, emotional disorders may coexist with physical illness, leading to a complicated clinical presentation, poor response to treatment, unnecessary investigation and referral to other hospital departments (13). In identifying and coping with patients with neurotic complaints, one aim will be to avoid inappropriate investigations, referral and treatment and to prevent the build-up of a cycle of frequent attendance and ‘medicalization’ of underlying social problems (14).
The present study is a continuation of a previous research project designed to test the validity of the Arabic versions of the Self-Reporting Questionnaire (SRQ-20) (15) and the Hospital Anxiety and Depression (HAD) Scale (16) in a sample of primary health care attenders in Al Ain, the United Arab Emirates (UAE). The aims of the present study were to use the data obtained from those studies to develop an Arabic primary health care screening scale for anxiety and depressive states, and to test its validity in a new sample. The core of this scale will be composed of the best predictors of potential cases among the items of the Arabic versions of the HAD and SRQ-20 scales. The rationale was to screen for patients with clinically significant anxiety and/or depressive symptoms, who require a more elaborate and comprehensive interview by the general practitioner, with the aim of managing the patient within the primary health care setting or referring such patients to specialist services. Potential cases in this setting are intended to indicate clinically significant symptoms and patients' suffering, rather than being related to a classificatory system. The psychiatric states which present in primary care do not fall readily into established classification systems, e.g. either the ICD or DSM-III (17). The threshold of the proposed scale will serve to alert the busy general practitioner to the possibility that anxiety or a depressive disorder may be present.

Material and methods

The Primary Care Anxiety and Depression (PCAD) Scale. For the purpose of developing this scale, the data obtained from previous local studies, using the Arabic version of both the HAD and SRQ-20 scales in a sample of 217 patients, was used (16–18). In those studies, all patients underwent four independent clinical evaluations, and hence four clinical scores were obtained. The four clinical evaluations included the Clinical Interview Schedule (CIS) (19), the overall Severity Rating (OSR), a psychiatric clinical evaluation of anxiety and another such evaluation of depression. Each of the four clinical scores was regressed on the scores on all 34 items of the two questionnaires (20 items of the SRQ-20 and 14 items of the HAD). The stepwise regression method was used to identify the items that were the best predictors of each of the four clinical scores. These included the items which were the best predictors in all four assessments, in three and two assessments and in one assessment. This pool of the best predictors from the two scales included some duplications of items conveying similar concepts, e.g. enjoyment, loss of interest, etc. When such items were combined, a total of the nine best predictor items was generated. These consisted of three anxiety, three depressive and three somatic items. The somatic items concerned sleep, fatiguability and headaches. The headache item was excluded because it is also linked to many physical and psychological conditions. The sleep and fatiguability items were among the strong predictors of potential psychiatric cases.

Four other items from both the HAD scale and the SRQ-20, but not among those selected as the best predictors, were added to the eight items, giving a total of 12 items. The four additional items were two anxiety and two depression items. The rationale for adding these four items was to include additional concepts of clinical importance in the authors' experience, and to construct a 12-item scale, rather than an 8-item one, which we consider would be more balanced and comprehensive. The 12 items finally selected were two somatic items (for detecting both anxiety and depression), five psychic anxiety items and five psychic depression items (Table 1).

The newly developed scale items were translated by the principal investigator (O.E.F.R.), who carefully worded and phrased the Arabic items in such a way as to ensure that the original construct of each item was preserved. It was crucial during the translation to take into consideration the colloquial Arabic language and the connotations of different words and phrases used by the population under study. Back-translation was done by another bilingual psychiatrist who was not acquainted with the English version. The two translators then met in order to agree on a final translated version after considering any necessary changes, modifications and re-wording, and resolving the differences and discrepancies that had arisen.

Questionnaire. A 4-page questionnaire was designed for use in this study. Page 1 included questions about relevant sociodemographic data, page 2 contained the Arabic version of the PCAD scale, page 3 was designed for PHC physicians to record the results of their assessment of anxiety and depressive states, and page 4 was designed for recording the findings of the psychiatric standardized clinical interview for assessment of anxiety and depressive states.

Subjects and procedure

The study subjects (aged 16–65 years) were recruited from consecutive patients attending the PHC centre. Subjects were selected regardless of the type of complaint, with the exception of the very ill, individuals with poor command of the
### Table 1: Validity statistics for the 12 items of the PCAD Scale

<table>
<thead>
<tr>
<th>Question no.</th>
<th>Anxiety (A), Depression (D), or both (A-D)</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>Kappa value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do you sleep badly?</td>
<td>A &amp; D</td>
<td>79.5</td>
<td>63.3</td>
</tr>
<tr>
<td>2</td>
<td>Do you feel nervous and tense, and find it difficult to relax?</td>
<td>A</td>
<td>79.5</td>
<td>49.4</td>
</tr>
<tr>
<td>3</td>
<td>Do you feel cheerful and able to laugh easily?</td>
<td>D</td>
<td>36.4</td>
<td>92.4</td>
</tr>
<tr>
<td>4</td>
<td>Do you experience unwarranted fears?</td>
<td>A</td>
<td>65.9</td>
<td>83.5</td>
</tr>
<tr>
<td>5</td>
<td>Have you lost interest in things, e.g. appearance, work, food, etc.?</td>
<td>D</td>
<td>56.8</td>
<td>80.5</td>
</tr>
<tr>
<td>6</td>
<td>Do you experience a frightened feeling as if something awful was about to happen?</td>
<td>A</td>
<td>52.3</td>
<td>77.2</td>
</tr>
<tr>
<td>7</td>
<td>Do you cry, or feel about to cry, more than usual?</td>
<td>D</td>
<td>55.9</td>
<td>75.9</td>
</tr>
<tr>
<td>8</td>
<td>Do worrying thoughts go through your mind?</td>
<td>A</td>
<td>79.5</td>
<td>55.7</td>
</tr>
<tr>
<td>9</td>
<td>Do you still enjoy the things you used to enjoy, e.g. TV programmes, hobbies, etc.?</td>
<td>D</td>
<td>56.8</td>
<td>82.3</td>
</tr>
<tr>
<td>10</td>
<td>Do you experience sudden feelings of panic?</td>
<td>A</td>
<td>27.3</td>
<td>97.5</td>
</tr>
<tr>
<td>11</td>
<td>Do you feel as if you are slowed down?</td>
<td>D</td>
<td>75.0</td>
<td>57.0</td>
</tr>
<tr>
<td>12</td>
<td>Do you feel tired and lacking in energy?</td>
<td>A &amp; D</td>
<td>72.7</td>
<td>54.4</td>
</tr>
</tbody>
</table>

Arabic language, those who refused to participate, those who had been screened during a previous visit and those coming for reasons other than health problems, e.g. to obtain certificates, receive vaccination, etc. Research for the study was conducted for 3 days a week.

In this town, the primary health care centres have no definitive practice list, nor are baseline statistics available, including composition by age and sex of the population served by the PHC. Therefore it was not possible to determine the representativeness of the sample.

Preliminary screening was performed by a bilingual research technician who had been trained in the entire procedure before embarking on the research. Patients were screened by the technician while they were waiting to see the primary health care physician. The screening took place in a separate room. The purpose and nature of the study were explained to each patient, and it was made clear that there was no obligation to take part. The technician administered pages 1 (socio-demographic variables) and 2 (the Arabic PCAD) of the questionnaire. Due to the high level of illiteracy, patients were assisted in completing the questionnaire by having its items read aloud to them. Each patient then saw the PHC physician about the presenting complaint and for psychiatric assessment. An arrangement was made with the PHC physicians working in the study centre to assess anxiety and depression in the study subjects and to score their results on page 3 on a 4-point scale, where 0 = non-case, 1 = mild, 2 = moderate and 3 = severe. All PHC physicians were fluent in spoken Arabic and had fairly substantial experience of working in this country. None of them refused to contribute to the study. Each patient then saw the psychiatrist (the principal investigator) after he or she had seen the PHC physician, for a standardized clinical interview, i.e. all of the interviews were conducted by the same psychiatrist. The psychiatric interview took place with the interviewer blind to the results of both the preliminary screening and the PHC physician’s assessment. A comprehensive clinical interview designed to detect and assess the levels of anxiety and depression was conducted. Careful enquiry was made about relevant psychosocial background variables. Each of the anxiety and depressive states was rated on a 4-point scale, where 0 = non-case, 1 = mild, 2 = moderate and 3 = severe, i.e. it was similar to the PHC physician’s scoring. The psychiatrist recorded his assessment results on page 4 of the questionnaire.

At the end of each working session, page 4 (containing a record of the psychiatric clinical interview) was attached to the other 3 pages (containing the preliminary screening data and PHC physician’s assessment). The pages were matched by a serial number that was assigned to all sheets before separating pages 3 and 4.

Data analysis

The data were edited using the EXCEL software package, and statistical analysis was performed using the BMDP package (dynamic version). The 4F
El-Rufaie et al.

Program was used to calculate Spearman rank correlations, to construct $2 \times 2$ tables and to calculate various validity statistics such as sensitivity, specificity and the overall measure of reliability, kappa. The 4M program was used for exploratory factor analysis and the calculation of Cronbach alpha values. Factors were extracted by principal-component analysis using Varimax. No predetermined structure was assumed for the factors.

Results

The response rate was 100%, i.e. none of the patients refused to participate in the study. A total of 123 primary health care patients were included in the investigation; there were 80 (65%) males and 43 (35%) female subjects. Their ages ranged from 16 to 65 years, with a median age of 34 years.

In total, 49 patients (39.8%) were UAE citizens, 20 patients (16.3%) were Omani, 48 patients (39%) were other Arabs and only six (4.9%) were Asian. All 123 patients could converse in Arabic, and 117 (95.1%) of them spoke it fluently. Most (73.2%) of the respondents were married, 25.2% of them were single, and the rest were widowed.

PCAD item-by-item analysis (validity statistics)

The score on each PCAD item was allocated to one of two groups, either the negative group for a rating of 0, or the positive group for a rating of $\geq 1$. Similarly, the total score given by the psychiatrist (the anxiety+depression score) was also allocated to either a negative group for a rating of 0 or a positive group for a rating of $\geq 1$. Table 1 shows the validity statistics for each individual item, using the psychiatric evaluation as the gold standard.

Table 1 indicates that each individual item is a valid predictor of the diagnosis provided by the consultant psychiatrist of either anxiety or depression, or both. All of the items have a fairly balanced combination of sensitivity and specificity, except for items 3 and 10, which had a high specificity and low sensitivity. Items 1, 2 and 8 were found to have significantly higher sensitivity and lower specificity. Item 4 had the highest overall measure of reliability (kappa value), followed by items 5 and 7. Items 1 and 12 are of a general nature, i.e. they are not specifically oriented to either anxiety or depression alone. Both items were found to have higher sensitivity than specificity, although item 1 yielded better results for both.

Item-by-item analysis (consistency)

Factor analysis of the 12 scores on the 12 items of the PCAD scale indicates that the 12 items can be reduced to two factors or principal components. However, the scale was analysed first as one instrument in order to identify cases of anxiety and/or depression as a whole, and the overall measure of consistency of all 12 items of the scale was tested by means of Cronbach’s alpha. The latter was also calculated for the rest of the items when one item had been removed in order to determine whether any items have a particular impact on the overall measure. The score for each question and the total score were correlated (Spearman rank correlation) with the total score (anxiety+depression) assigned by the PHC physician and that assigned by the consultant psychiatrist. The value of Cronbach’s alpha was given for all 12 items in the last row of column 4, and for all items except the corresponding one in the previous rows of the same column in Table 2. In the first column of this table, the correlations between each item and the total PCAD score minus this particular item are given. The second and third columns show the correlations with the scores assigned by the PHC physician and the consultant psychiatrist, respectively.

Table 2 shows strong correlations between each item and the total minus this item, and also with the total score assigned by the consultant psychiatrist, and weak correlations with the score given by the PHC physician. The high values and narrow range of Cronbach’s alpha also indicate a high level of consistency between all of the 12 items.

Cut-off points

The validity statistics for various cut-off points on the PCAD scale to identify potential cases are shown in Table 3.
The prevalence rate will be 35.8% (44 cases out of 123 subjects). On the other hand, if 7/8 is used as a threshold, the prevalence rate will be 43.9% (54 cases out of 123 subjects). The latter prevalence rate is equal to the real prevalence rate in this sample. Therefore, we suggest that the threshold of 8/9 will be more appropriate to situations in which estimation of the prevalence rate is the primary aim of the work, e.g. research studies, while the threshold of 7/8 will be more appropriate when the main aim is to minimize the number of missed cases, e.g. as a screening instrument to alert a busy PHC physician to potential cases. In order to fulfill the aim of this study by providing an alerting device for the PHC physician, we are of the opinion that the threshold of 7/8 would be more appropriate. However, the thresholds for identifying potential cases suggested in this study are considered to be arbitrary guidelines for primary health care physicians. It is difficult to regard a mild emotional disorder as being either present or absent, since the degree of distress and the impact of that distress vary throughout the population. Accordingly, the level of distress experienced by an individual is of more relevance and practical importance than knowing whether distress is present or absent. This is why threshold ranges rather than a well demarcated cut-off point may be appropriate in the use of such screening scales (13). However, in order to simplify the procedure to be followed in busy primary health care centres, we established the optimal cut-off points according to our statistics, but it is left to other workers to adjust the suggested thresholds according to their specific needs and local findings.

The score on the scale is intended to reflect the state of mood over the preceding 2 weeks. This was thought to be more appropriate than assessing the mood prevailing at the time of completion of the questionnaire or alternatively during the previous few days, e.g. the previous week, both of which could be influenced by the presenting complaint or another transient health, familial or social problem.

The PCAD is a short scale containing 12 items. The number of items to be included in such scales is open to debate. However, recent studies have shown that short scales perform as well as or even better than long ones (13, 15, 20). The scale includes two somatic and 10 psychological items. The rationale for including the somatic items was that our local validity studies showed that both of these somatic items had a high positive predictive value, and that psychological items were not significantly better detectors of emotional disorders than somatic items (15). A recent report indicated that there was no cultural difference in somatic and psychological symptoms when these were assessed independently of consultation with a doctor (21). These findings conflict with other reports of somatic presentation of psychiatric disorders in developing countries (22).

### Table 3. Cut-off points for the PCAD Scale

<table>
<thead>
<tr>
<th>Cut-off point</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>Kappa value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/3</td>
<td>90.9</td>
<td>31.6</td>
<td>0.18</td>
</tr>
<tr>
<td>3/4</td>
<td>86.4</td>
<td>36.7</td>
<td>0.19</td>
</tr>
<tr>
<td>4/5</td>
<td>86.4</td>
<td>48.6</td>
<td>0.28</td>
</tr>
<tr>
<td>5/6</td>
<td>84.1</td>
<td>58.2</td>
<td>0.37</td>
</tr>
<tr>
<td>6/7</td>
<td>84.1</td>
<td>69.6</td>
<td>0.50</td>
</tr>
<tr>
<td>7/8</td>
<td>81.8</td>
<td>77.2</td>
<td>0.56</td>
</tr>
<tr>
<td>8/9</td>
<td>70.5</td>
<td>83.5</td>
<td>0.54</td>
</tr>
<tr>
<td>9/10</td>
<td>65.9</td>
<td>89.1</td>
<td>0.53</td>
</tr>
<tr>
<td>10/11</td>
<td>61.4</td>
<td>89.6</td>
<td>0.52</td>
</tr>
</tbody>
</table>

The optimal cut-off point for a balanced combination of sensitivity and specificity, which also achieves the maximum value for kappa (the overall measure of reliability), is 7/8. An alternative option is a cut-off point of 8/9, depending on its intended use, as will be discussed later.

### Discussion

The results of this study indicate that the Primary Care Anxiety and Depression (PCAD) scale is a valid instrument for detecting clinically significant anxiety and depression in patients attending primary health care clinics. The scale has also shown a closer correlation with the independent psychiatrist's clinical judgement than with the general practitioner's judgement. Furthermore, the results indicate that all PCAD items are highly valid and each is highly correlated with the total of other items. All items correlated positively with the psychiatrist's assessments; their correlations with the general practitioners' assessments were also positive, but weaker. Another indicator of the superiority of the scale compared to the PHC physicians' assessments is the overall measure of reliability (kappa); 10 of the 12 items of the PCAD had higher kappa values than those for the PHC physicians' assessments.

The results suggest two options for the cut-off points for identifying potential cases (Table 3). If 7/8 is selected as a cut-off point, only 18.2% of cases will be missed (the sensitivity is 81.8%), and at the same time 22.8% of non-cases will wrongly be identified as cases. If the alternative cut-off of 8/9 is chosen, then 29.5% of cases will be missed (sensitivity is 70.5%), and 16.5% of non-cases will be incorrectly identified as cases. At the same time, if 7/8 is used as a threshold, the prevalence rate of minor psychiatric morbidity in the studied sample will be 43.9% (54 cases out of 123 subjects); on the other hand, if 8/9 is used as a threshold, the prevalence rate will be 35.8% (44 cases out of 123 subjects).
The scale is basically a self-administered one, and literate patients can easily complete it themselves. However, due to the high level of illiteracy in this area, it is assumed that in most situations the scale will need to be administered by a nurse or other medical or health auxiliary. The respondent is allowed to choose one of four responses. This gives enough flexibility for rating from very mild to severe suffering caused by the symptom under consideration. Appropriate training for the staff administering the scale is essential.

This scale is more or less similar to the HAD scale, from which some items of this scale were derived. The Arabic version of the HAD has already proved to be a valid instrument for detecting PHC morbidity in this country (16). Although a comparison between the HAD and the PCAD in PHC settings should be useful, this was not one of the objectives of the present study. The two studies were conducted on two different samples at different times. Moreover, the PCAD scale is intended to target anxiety and/or depression without distinction, while the HAD has two separate and specific subscales, one for anxiety and one for depression. This makes comparison of the sensitivity and specificity of the two scales neither easy nor useful.

Although the scale was designed for PHC patients, using data collected in PHC clinics, there is no reason why it could not be used in other clinical and non-clinical settings, but it will be necessary to validate it before using it in such settings.

Acknowledgements

The authors would like to thank Mr S. Sabri for assistance with data collection and entry, and Mr M. Govindan for assistance with the preparation of the manuscript.

References