

ORIGINAL PAPER

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Retesting the validity of the Arabic version of the Hospital Anxiety and Depression (HAD) scale in primary health care

Accepted: 12 May 1994

Abstract The Arabic version of the Hospital Anxiety and Depression (HAD) scale was retested and cut-off points determined in a sample of 217 patients attending a primary health care centre in Al Ain, United Arab Emirates (U.A.E.). Subjects were screened using the HAD scale and all patients were then interviewed by a single consultant psychiatrist. The scale scores were assessed against the psychiatrist's clinical evaluations. The study furnished evidence that the Arabic version of the HAD scale is a valid instrument for detecting anxiety and depressive disorders in primary health care settings. Spearman rank correlations of all items of the scale were significantly above zero. The butterflies item of the anxiety subscale had the lowest correlation coefficients. The overall Cronbach alpha measures of internal consistency were 0.7836 and 0.8760 for anxiety and depression, respectively. The cut-off points that produced a balanced combination of sensitivity and specificity appropriate for referral to a psychiatric facility by the general practitioner were 6/7 for anxiety and 3/4 for depression. Almost all other similar studies have determined a single cut-off point for both subscales of the HAD. This study also indicated that the HAD depression subscale is more consistent and more predictive than the HAD anxiety subscale. Moreover some of the problems arising from applying psychiatric research instruments across cultures are highlighted by this study.

Introduction

The Hospital Anxiety and Depression (HAD) [1] scale was designed to be a reliable instrument for detecting states of anxiety and depression in the setting of hospital medical out-patient clinics, i.e. it was designed for the physically ill. It is brief and limited to the two most common aspects of mood disorder presenting in hospital practice (i.e. anxiety and depression). It is composed of 14 items, 7 for anxiety and 7 for depression (Tables 1 and 2). Items representing symptoms of severe mood disorders (e.g. suicidal thoughts) or bodily symptoms likely to occur in physical illness have been excluded. A characteristic feature of the HAD is that the concepts of anxiety and depression are separated. The concept of depression is focused on the anhedonic state (five of the seven items of the depression subscale reflect loss of pleasure), since this state may be the nearest clinical marker available for the biogenic, or drug responsive state of mild depression [2]. Most other screening instruments detect a 'case' but give no information about the nature of the psychiatric disorder, while the HAD detects and assesses the severity of the commonest two neurotic disorders encountered in clinical practice. Compared with other similar scales, the HAD is short and takes a few minutes for the patient to complete while waiting to see the treating doctor. The scale has been translated into a number of languages. The English version and some translated versions have been used in various settings, e.g. validation studies [3, 4], general psychiatry [5], cardiovascular disorders [6], oncology [7], etc. The HAD has a 4-point response scale, 0–3, according to severity.

The Arabic version of the HAD scale has been used in primary health care setting [8] and in a general hospital medical clinic [9]. The first validity study of the Arabic version of the HAD has been conducted in Saudi Arabia and has proved to be a valid instrument for detecting states of anxiety and depression in primary health care settings. Spearman rank correlations of all items of the scale, except for one (the butterflies item),

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are statistically significant [10]. The present study was done as part of a larger study in Al Ain, United Arab Emirates (U.A.E.). This area is not far from the area where the first study was done, but in Al Ain, the influence of the Bedouin life-style, including spoken language, is greater among the nationals than in eastern Saudi Arabia. Due to this variation in the spoken Arabic language (influence of the Bedouin language), and a probable higher illiteracy rate, the authors felt it was necessary to retest the validity of the scale before using it for various purposes in this area. Accordingly, the aims of the study were to retest the validity of the Arabic version of the HAD among a group of U.A.E. nationals attending a primary health care centre in Al Ain, UAE, to investigate the validity of the butterflies item after changing the wording to Arabic words normally used by local people in Al Ain without changing the original concept of the item and finally, to define the best cut-off point for caseness. U.A.E. nationals constitute a small majority among the huge number of expatriates from more than 40 countries who came to work in this Gulf area. The study was limited to U.A.E. nationals so as to exclude the influence of possible economic and sociocultural factors (including migration), which vary among different nations, and because of the language barrier since most expatriates do not speak Arabic or their command of the language is poor. The work was done in a primary health care centre, a setting for which the scale was primarily designed, i.e. out-patients attending non-psychiatric departments [1]. The two subscales of the HAD may be of interest to the researcher or clinician who wishes to identify specific mood disorders, as well as an overall screening for psychiatric caseness [4].

Methods

This study was part of a larger study, and only parts relevant to this HAD scale study will be highlighted. The study was conducted in a primary health care centre in Al Ain, U.A.E. Al Ain is a town with a multiethnic population of between 200,000 and 250,000. Data were collected during the period from December 1991 to March 1992.

Research instruments

The Arabic version of the HAD scale [1]

The principal investigator who is bilingual made some changes in the original Arabic translation of the scale provided by the designers. Then back-translation was done by a bilingual psychiatrist who was not acquainted with the English version. The principal investigator and the translator met and made necessary corrections, modifications and rewording, and considered the minor differences and discrepancies that had occurred. Back-translation is not always a sufficient check of equivalence [11]. However, Werner and Campbell consider the back-translation method to be best [12]. Two sessions were then held between the principal investigator and the bilingual research technician who was assigned to conduct the preliminary screening stage of the study. All scale items were discussed in detail and agreement was reached on what Arabic words

to use if the translated scale words were not understood by a patient, i.e. to translate concepts and not words, taking into consideration cross-cultural equivalence.

Questionnaire

A four-sheet questionnaire was designed for the purpose of this study as part of a more comprehensive survey. Sheet 1 included questions about relevant sociodemographic variables. Sheet 2 comprised the Arabic version of the Self-Reporting Questionnaire (SRQ) [13]. (The work related to the SRQ will be published elsewhere). Sheet 3 comprised the Arabic version of the HAD [1]. Sheet 4 was designed for documenting coded items from the Clinical Interview Schedule (CIS) [14] for purposes of the larger study. It also included a five-point scale for assessing the level of anxiety and depression in a semi-structured, standardized clinical interview.

Subjects and procedure

Study subjects were U.A.E. nationals (16 years or above) attending the primary health care centre, irrespective of the type of their complaints, except for the very ill, those who refused to participate, those who were screened during a previous visit and those attending for reasons other than health complaints, e.g. for certificates, vaccination etc.

Systematic random sampling was adopted; one patient was chosen at random from those who reported to the health centre during the first half-hour and then the first patient who reported to the health centre at the beginning of every hour until the end of the session. It is unfortunate that the primary health care centres in this country have no baseline statistics, including age/sex breakdown of the population served by the health centres, and, therefore, it was not possible to test the representativeness of the study sample. However, the authors consider the study sample as representative of the health centre attenders, rather than the practice list, because of the randomness of the selection procedure. Patients were screened and interviewed 3 days a week, both in the morning and afternoon sessions. Screening was conducted by a bilingual research assistant who had been trained in the procedure before embarking on the study. Patients were screened while waiting to see the primary health care physician. The nature of the study was explained to each patient and it was made clear that there was no obligation to participate. The research assistant conducted the first stage of screening in a separate room using the first three sheets of the questionnaire, i.e. sociodemographic data and the Arabic version of both the SRQ-20 and the HAD. Each patient saw the psychiatrist (the principal investigator) after seeing the primary health care physician for a standardized clinical interview, i.e. all interviews were done by the same psychiatrist. The psychiatric interview was done without knowledge of the screening results. A standardized comprehensive clinical interview aimed at detecting and assessing the level of anxiety and depression was conducted. While assessing anxiety and depression, the psychiatrist focused on the same constructs of the HAD, i.e. psychic (rather than somatic) manifestations and capacity for pleasure. Careful enquiry was made about relevant psychosocial background. For anxiety and depression, patients given ratings of 0 and 1 at this interview were considered to be non-cases and those given a rating of 3 and 4, to be definite cases. Patients given a rating of 2 (doubtful cases) were considered as cases if given a rating of 2 or more in the Overall Severity Rating (OSR) scale, and non-cases if given a rating of less than 2. The OSR was recorded during the standardized clinical interview as an integral part of the CIS, which was used for purposes relevant to other components of this comprehensive study. Again, this case definition is similar to the one used by the authors in their previous validity study of the

Table 1 Spearman rank correlations of the anxiety subscale of the Hospital Anxiety and Depression (HAD) scale

Question number Q(I) ^a	Spearman rank correlation	
	With total minus Q(I)	With clinical score
Q(1) I feel tense or 'wound up'	0.651	0.475
Q(2) I get a sort of a frightened feeling as if something awful is about to happen	0.589	0.505
Q(3) Worrying thoughts go through my mind	0.418	0.417
Q(4) I can sit at ease and feel relaxed	0.576	0.545
Q(5) I get a sort of frightened feeling like 'butterflies' in my stomach	0.324	0.173
Q(6) I feel restless as if I have to be on the move	0.441	0.336
Q(7) I get sudden feelings of panic	0.361	0.225

^a I, a running index for the number of the question

Table 2 Spearman rank correlations of the depression subscale of the HAD

Question number Q(I) ^a	Spearman rank correlation	
	With total minus Q(I)	With clinical score
Q(1) I still enjoy the things I used to enjoy	0.639	0.589
Q(2) I can laugh and see the funny side of things	0.605	0.606
Q(3) I feel cheerful	0.505	0.492
Q(4) I feel as if I am slowed down	0.620	0.545
Q(5) I have lost interest in my appearance	0.478	0.484
Q(6) I look forward with enjoyment to things	0.525	0.503
Q(7) I can enjoy a good book or radio or T.V. programme	0.629	0.553

^a I, a running index for the number of the question

HAD [10] except for doubtful cases, which were discriminated in this study into cases and non-cases using the OSR.

At the end of each working session, sheet 4 (for recording the psychiatric clinical interview) and the other 3 sheets (for the preliminary screening) were attached together. They were matched by a serial number that was assigned to the four sheets before separating sheet 4.

Data analysis

Data that were recorded on precoded columns in the questionnaire were fed into a computer and analysed using SPSS-PC. The BMDP package, the dynamic version release programs and 4M were utilized for statistical analysis. Spearman rank correlations were computed between each question and the clinical score and with the total of the subscale minus that particular question. The overall Cronbach alpha was also calculated for each subscale to measure

the consistency among all the items in each subscale. Two-by-two contingency tables were formed and the kappa measure of reliability, along with other relevant statistics, was obtained for each cut-off point.

Results

The results presented here were derived from data collected during a comprehensive multiobjective study conducted in Al-Ain, UAE. Out of 224 randomly selected patients who met the criterion for inclusion in the study, seven were not included because of shortage of time (a response rate of 96.9%).

A total of 217 patients (138 females and 79 males) were screened for psychiatric morbidity while waiting to see the primary health care physician and then all of them were interviewed by a consultant psychiatrist (OR) after seeing the primary health care physician. The patient's ages ranged from 16 to 80 years with a median of 33 years. Only the results concerning the validation and calibration of the Arabic version of the HAD scales in the primary health care setting in Al Ain will be presented in this paper.

Content validity and consistency

Spearman rank correlations between the score for each question and the total score of the subscale minus that particular question are presented in Tables 1 and 2 for anxiety and depression, respectively. The score for each item was also correlated with the score of the final clinical assessment. All correlations were positive and were significantly higher than zero.

Among items in the anxiety subscale, the Spearman rank correlations of the scores for questions 1,2 and 4 had the highest values in both columns. Question 5 (the butterflies item) had the lowest correlation coefficients in both columns followed by question 7. Of note in Table 1 is that the order of the strength of association consistent in both columns. It is clear from Table 1 that the stronger the association between the score for a particular item and the anxiety score assigned by the psychiatrist, the stronger its association with the total HAD anxiety subscale minus that particular item. In other words, the more indicative a particular question was of the clinical status of the patient, the more consistent it was with the total of other items in the HAD anxiety subscale. The overall Cronbach alpha measure for all seven items in the anxiety subscale was 0.7863. This indicated a fairly consistent instrument.

Correlation coefficients concerning depression are presented in Table 2. Questions 1, 2 and 7 had the highest correlations in both columns. Question 5 had the lowest correlations followed by question 3 and then question 6. The same pattern of ranking of the values of the Spearman correlation coefficients in the two columns that was seen in Table 1 is also observed in Ta-

Table 3 Validity statistics for different cut-off points on the total score of the HAD anxiety subscale

Cut-off point	Sensitivity [%]	Specificity [%]	Kappa value (reliability)	[%]
4/5	92.7	60.8	0.331	49.3
5/6	82.9	70.5	0.376	39.6
6/7	78.0	80.7	0.476	30.4
7/8	70.7	86.9	0.523	24.0
8/9	65.9	92.6	0.590	18.4
9/10	48.8	94.3	0.480	13.8
10/11	43.9	96.6	0.482	11.1
11/12	24.4	96.6	0.274	7.4

Table 4 Validity statistics for different cut-off points on the total score of the HAD depression subscale

Cut-off point	Sensitivity [%]	Specificity [%]	Kappa value (reliability)	[%]
1/2	90.6	59.1	0.356	53.0
2/3	83.0	77.4	0.513	37.3
3/4	81.1	85.5	0.610	30.9
4/5	77.4	89.0	0.639	27.2
5/6	69.8	93.3	0.652	22.1
6/7	66.0	97.0	0.687	18.4
7/8	54.7	98.2	0.611	14.7
8/9	47.2	99.4	0.563	12.0
9/10	35.8	99.4	0.446	9.2

ble 2 and, hence, the same conclusion can be drawn as in the analysis of the anxiety subscale.

It is clear that the values of the Spearman correlation coefficients were on average, greater in depression than anxiety. The same was true when comparing the Cronbach alpha values in the two subscales. This indicates that the HAD depression subscale was more consistent and more predictive than the HAD anxiety subscale. The overall Cronbach alpha value for all seven items in the depression subscale was 0.8760. Such a high alpha value reflects a great deal of consistency among the seven items of the depression subscale.

Cut-off points

Tables 3 and 4 show the validity statistics for various cut-off points on the anxiety and depression subscales, respectively, including some of the cut-off points where the greatest kappa values were achieved. For every cut-off point, the sensitivity, specificity and the overall kappa measure of reliability are presented. In both tables, one can easily see the declining percentages of sensitivity and increasing percentages of specificity as the cut-off point to determine caseness is moved upward. Also, increasing then decreasing values for the kappa measure of reliability is observed in both tables.

In the anxiety subscale (Table 3), the maximum kappa value achieved was 0.590. This value corresponds to a cut-off point 8/9, sensitivity of 65.9% and specificity of 92.6%. If this cut-off point is used in primary health

care patients to determine suspected cases that should be referred for further investigation by a consultant psychiatrist, then 31.6% of cases of anxiety will be missed, i.e. out of every 1000 cases of anxiety, only 684 cases will be detected and referred and the other 316 cases will be missed. On the other hand, only 78 out of every 1000 persons free of the disease will be unnecessarily referred to a consultant psychiatrist. This may be economical in resources but inadequate for health care delivery. A balanced combination of sensitivity and specificity to improve health care services, staying within economically acceptable boundaries, should be considered. Careful inspection of Table 3 suggests the cut-off point of 6/7 as best to reach a reasonable compromise. According to the standardized clinical evaluation of the psychiatrist, the prevalence rates of anxiety and depression were 18.4% and 24.0%, respectively. Tables 3 and 4 indicate that the HAD cut-off points that would provide the nearest values to the previously estimated prevalence rates are 8/9 for anxiety and 5/6 for depression. It may be suggested at this point that if the researcher's objective is to estimate the prevalence rate, then the latter cut-off points would be more appropriate.

Table 4 is concerned with the HAD depression subscale. It should be noted that the values of kappa and the overall measure of reliability, are, on average, greater than the kappas for the anxiety subscale presented in Table 3. This fact reinforces the conclusion drawn in the previous section about the consistency and the predictability of the two subscales. The highest kappa value achieved for the total score on the HAD depression subscale was 0.652. This value was achieved at the cut-off point 5/6. Using the same argument as above, a balanced combination of sensitivity and specificity that would improve the adequacy of care with little sacrifice from the economic point of view would occur at a cut-off point of 3/4. This is the threshold that would maximize predictability and minimize misclassification.

Discussion

The results of this study suggested two cut-off points, one for each subscale: 6/7 for anxiety and 3/4 for depression. Other studies of the HAD have defined one cut-off point for both subscales. In this study, the cut-off point was determined by a careful balance between sensitivity and specificity. A lower sensitivity and consequently a higher false-negative rate will result in missing more 'cases'; while a lower specificity and consequently a higher false-positive rate will lead to more 'non-cases' being unnecessarily selected for psychiatric interview or follow-up. The best cut-off point selected was the point with the highest level of sensitivity among the points with the highest kappa measure of overall reliability. The designers of the scale presented it with score ranges for both subscales. If the scale is to be used in research, the cut-off point for a 'case' may be either the upper or lower end of the borderline range.

Where the research requires the inclusion of only those patients who have a high probability of suffering from the mood disorder, i.e. a low proportion of false-positives, then the upper end of the borderline score range (10/11) for each of the subscales should be used. However, should the research require inclusion of all possible cases, i.e. a low proportion of false-negatives, then the lower end of the borderline score range (8/9) for each of the subscales should be used [1]. This concept of score range conforms with the notion that disease is best conceived as a continuum [16], and this view seems especially appropriate for minor psychiatric disorders [17]. However, Wilkinson and Barczak and Andrews et al. suggest a threshold of 7/8 [18, 19]. Lewis and Wesley have defined the cut-off point at 10/11 [17, 20].

Both thresholds defined in this study were lower than those obtained by the scale designers and other researchers. However, the anxiety threshold of 6/7 is comparable to the results of others, but the depression threshold of 3/4 is far less. This is consistent with the findings of Nayani who has demonstrated that it is possible to detect depressive illness in Asian patients using the Urdu version of the HAD, but its role as a screening instrument for anxiety is limited [21]. It is difficult to explain the reasons behind these differences. Perhaps the Arabic version of the scale items, due to linguistic and other sociocultural factors, is a better detector of the emotional state than the English version. The predominance of items on the anhedonic state in the depression subscale possibly render it a more sensitive detector of depression. However, the influence of the criteria for what constitutes a 'case' on the threshold level is most likely stronger than the previously assumed factors. There is evidence that the clinical features of depressives in primary care are different from those of depressed in-patients [22–25]. However, Pilowsky and Spence have found no difference in severity, but they have found less endogenous depression in primary care [26]. Another argument is that mild psychiatric disorders in primary care are often regarded as non-specific, corresponding to a group of 'distress syndromes' where psychiatric diagnosis may be of limited value [27]. In spite of these difficulties, an attempt at diagnostic distinction is necessary when a decision has to be made regarding the use of antidepressants and other treatments [28]. This is particularly so for the HAD, which was basically designed to identify patients needing psychiatric treatment.

This study confirmed that the Arabic version of the HAD is a valid instrument for the detection and assessment of potential anxiety and depressive mood disorders in primary health care. However, the validation coefficients of the entire HAD items in this study were weaker than the coefficients obtained in the previous validity study of the Arabic version of the same scale done in Saudi Arabia with more or less similar methodology [10]. The weakest validation coefficients in the anxiety subscale were those of the last three items (Table 1) and the weakest of all the HAD items

was the butterflies item (question 5 in Table 1). The performance of this item did not show obvious improvement in comparison with its performance in the previous Saudi validity study, in spite of improving its Arabic translation in this study and putting it in a manner that conveyed the core concept of the original English item, rather than directly translating words and phrases. Its weakness is most likely related to inherent sociocultural factors that determine how people express their emotional disturbances. Recent studies have demonstrated differences in the clinical presentations of psychiatric illness among various cultures [29, 30]. There is considerable evidence that words that denote psychological emotional states in European lexicons are lacking in many non-Indo-European languages [31]. The findings of this study reflected one aspect of the problems arising from applying psychiatric research instruments across cultures, and confirmed the necessity of adequately validating such instruments before they are employed in different settings, especially in cultures different from the culture in which the instrument was originally designed.

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