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The Hospital Anxiety and Depression Scale (HADS): translation and validation study of the Iranian version

Ali Montazeri*[1,2], Mariam Vahdaninia[1], Mandana Ebrahimi[2] and Soghra Jarvandi[2]

Address: [1]Iranian Institute for Health Sciences Research and [2]Iranian Centre for Breast Cancer (ICBC)

Email: Ali Montazeri* - ali@jdcord.jd.ac.ir; Mariam Vahdaninia - IHSR@jdcord.jd.ac.ir; Mandana Ebrahimi - ICBC@neda.net; Soghra Jarvandi - ICBC@neda.net

* Corresponding author

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Abstract

Background: The Hospital Anxiety and Depression Scale (HADS) is a widely used instrument to measure psychological morbidity in cancer patients. This study aimed to translate and test the reliability and validity of the Iranian version of the HADS.

Methods: The English language version of the HADS was translated into Persian (Iranian language) and was used in this study. The questionnaire was administered to a consecutive sample of 167 breast cancer patients and statistical analysis was performed to test the reliability and validity of the HADS.

Results: In general the Iranian version of the HADS was found to be acceptable to almost all patients (99%). Cronbach's alpha coefficient (to test reliability) has been found to be 0.78 for the HADS anxiety sub-scale and 0.86 for the HADS depression sub-scale. Validity as performed using known groups comparison analysis showed satisfactory results. Both anxiety and depression sub-scales discriminated well between sub-groups of patients differing in clinical status as defined by their disease stage.

Conclusion: This preliminary validation study of the Iranian version of the HADS proved that it is an acceptable, a reliable and valid measure of psychological distress among cancer patients.

Background

The Hospital Anxiety and Depression Scale (HADS) is a brief and widely used instrument to measure psychological distress in cancer patients and it is available in many languages for example French, German, Dutch, Italian, Spanish, Chinese, and Arabic. It has been shown that the HADS gives clinically meaningful results as a psychological screening tool, in clinical group comparisons and in studies with several aspects of disease and quality of life. It is sensitive to change both during the course of disease and in response to medical and psychological interventions [1]. A recent review of the literature on the validity of the HADS clearly indicates that it is a well-performed questionnaire in assessing the symptom severity and caseness of anxiety disorders and depression in both somatic, psychiatric and primary care patients and even in the general population. The HADS is a popular instrument among researchers from different nations and it is estimated that since 1996 to 2002 the number of HADS papers' that have been published has increased almost fourfold [2].

Table 1: The characteristics of the breast cancer patients and their scores on the HADS (n = 167)

		No.	%
Age groups			
	24–29	14	8
	30–39	39	24
	40–49	47	28
	50–59	31	18
	60–69	25	15
	≥ 70	11	7
	Mean (SD)	47.2 (13.5)	
	Range	24–81	
Educational status			
	Illiterate	38	23
	Primary	78	46
	Secondary	33	20
	College/university	18	11
Marital status			
	Single	15	9
	Married	117	69
	Divorced/widowed	36	22
Disease stage			
	Local	29	17
	Loco-regional	76	45
	Metastatic	62	38
Anxiety score			
	Normal (0–7)	45	27
	Borderline (8–10)	43	26
	Caseness (11–21)	94	47
	Mean (SD)	10.6 (4.1)	
	Range	1–20	
Depression score			
	Normal (0–7)	102	61
	Borderline (8–10)	35	21
	Caseness (11–21)	30	18
	Mean (SD)	6.2 (4.5)	
	Range	0–17	

The aim of this study was to translate the HADS to Persian (Iranian language), validate and use the questionnaire in studies of quality of life in cancer patients in Iran. Currently there is no such questionnaire available in Iran.

Methods

Translation

The 'forward-backward' procedure was applied to translate the HADS from English into Persian (Iranian language). Two general practitioners translated the questionnaire into Persian and these were backward translated into English by a health professional and a professional translator. Then, a provisional version of the Iranian questionnaire was provided. There were some problematic terms such as 'wound up', 'butterflies in the stomach' and 'slowed down' which were culturally adapted and after a consensus by all authors the final version was developed.

Patients, data collection and statistical analysis

The final draft of the Iranian version was administered to a sample of newly diagnosed breast cancer patients attending the breast clinic of a large teaching hospital in Tehran, Iran. There were no restrictions on patient selection with regard to histologic type of breast cancer, age or other characteristics. A trained female nurse during one complete calendar year collected the data in face-to-face interviews. The study design and the method of data collection are fully explained elsewhere [3]. However, to test reliability the internal consistency of the questionnaire was measured using Cronbach's alpha coefficient and alpha equal to or greater than 0.70 was considered satisfactory. Validity of the instrument was performed using the known-groups comparison and convergent analysis [4]. Known groups comparison analysis was examined to test how well the questionnaire discriminates between sub-groups of patients who differed in clinical status as defined by

Table 2: Breast cancer patients' scores on the HADS anxiety and depression subscales by disease stage (n = 167)

	Anxiety score Mean (SD)	Depression score Mean (SD)
Disease stage		
Local	7.1 (3.7)	3.4 (3.6)
Loco-regional	10.4 (3.9)	6.2 (4.6)
Metastatic	12.5 (3.3)	7.6 (4.1)
*Test of significance**	*F = 21.5, P < 0.0001*	*F = 9.5, P < 0.0001*

* One-way analysis of variance.

their disease stage. Convergent validity was assessed using the correlation of each item with its hypothesized scale. The Pearson product moment statistic (Pearson's correlation coefficient) of 0.40 or above was considered satisfactory. Further analysis was carried out to demonstrate the extent to which the HADS correlates with two subscales derived from the validated Iranian version of the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30)[5]. It was expected that the anxiety and the depression subscale would correlate negatively with these measures (emotional functioning and global quality of life subscales). In addition inter-correlation between anxiety and depression subscales was calculated using Pearson's correlation coefficient.

Questionnaires

The HADS contains 14 items and consists of two subscales: anxiety and depression. Each item is rated on a four-point scale, giving maximum scores of 21 for anxiety and depression. Scores of 11 or more on either subscale are considered to be a significant 'case' of psychological morbidity, while scores of 8–10 represents 'borderline' and 0–7 'normal' [6]. Emotional functioning and global quality of life was measured using the EORTC QLQ-C30 subscales. Emotional functioning contains 4 items and each item is rated on a four-point scale and global quality of life contains 2 items and each item is rated on a seven-point scale. A linear transformation was performed to standardize the row scores. Scores of each subscales range from 0 to 100 and the higher values indicate a higher (better) level of functioning and global quality of life [7]. Demographic data were collected using a short questionnaire at the patients' first clinic visit and included recording of age, educational level, and marital status. Disease stage was extracted from case records.

Results

The characteristics of the breast cancer patients and their scores on the HADS are shown in Table 1. The mean age was 47.2 (SD = 13.5) years, most were married (68%), and had completed primary or secondary education (66%), and had loco-regional disease (45%). Almost all patients (99%) found the Iranian version of the HADS acceptable. The mean anxiety score was 10.6 (SD = 4.1) whereas this for depression was 6.2 (SD = 4.5).

The internal consistency of the HADS as measured by the Cronbach's alpha coefficient has been found to be 0.78 for the anxiety subscale and 0.86 for the depression subscale indicating a satisfactory reliability.

Validity of the HADS was examined using the known groups comparison and convergent analysis. The HADS well discriminated between sub-groups of patients as defined by their disease stage indicating that anxiety and depression scores were significantly higher in patients with advanced disease ($P < 0.0001$ on both subscales). The results are shown in Table 2. Convergent validity was assessed using the correlation of each item with its hypothesized scale and the results showed that the Pearson's correlation coefficient varied from the 0.47 to 0.83 for anxiety subscale and from 0.48 to 0.86 for depression subscale, and all were statistically significant ($P < 0.0001$). However, item 7 (I can sit at ease and feel relaxed) and item 11 (I feel restless if I have to be on the move) showed a weaker correlation with anxiety score ($r = 0.47$ and 0.50 respectively) and item 10 (I have lost interest in my appearance) showed a weaker correlation with depression score ($r = 0.48$). Furthermore, when the correlation between the HADS subscales and emotional functioning and global quality of life (subscales of the EORTC QLQ-C30) was investigated, as expected a significant negative correlation emerged. In addition there was a significant inter-correlation between anxiety and depression subscales as calculated by Pearson's correlation coefficient ($r = 0.72$, $P < 0.0001$). The results are shown in Table 3.

Discussion

This was a validation study of one of the most widely used instruments to measure anxiety and depression in cancer patients. The Iranian version of the HADS proved to be acceptable to patients and it is worth noting that the questionnaire was administered by a trained nurse in face-to-

Table 3: Correlation of HADS items with its hypothesized subscales, overall HADS; and HADS subscales and overall HADS with emotional functioning and global quality of life scores

	HADS-A (anxiety subscale)	HADS-D (depression subscale)	HADS (Overall)
Item number/Anxiety (HADS-A)	1	0.72	0.92
1/I feel tense or wound up	**0.77**	0.65	0.76
3/I get a sort of frightened feeling as if something awful is about to happen	**0.67**	0.51	0.63
5/Worrying thought go through my mind	**0.83**	0.72	0.83
7/I can sit at ease and feel relaxed	**0.47**	0.14	0.33
9/I get a sort of frightened feeling like 'butterflies' in the stomach	**0.76**	0.62	0.74
11/I feel restless as if I have to be on the move	**0.50**	0.14	0.33
13/I get sudden feeling of panic	**0.63**	0.58	0.65
Item number/Depression (HADS-D)	0.72	1	
2/I still enjoy the things I used to enjoy	0.60	**0.83**	0.78
4/I can laugh and see the funny side of things	0.60	**0.84**	0.78
6/I feel cheerful	0.65	**0.77**	0.76
8/I feel as if I am slowed down	0.44	**0.58**	0.55
10/I have lost interest in my appearance	0.31	**0.48**	0.43
12/I look forward with enjoyment to things	0.63	**0.86**	0.81
14/I can enjoy a good book or TV program	0.47	**0.79**	0.69
Emotional functioning	-0.67	-0.63	-0.70
Global quality of life	-0.68	-0.75	-0.77

* Pearson's correlation coefficient and all significant at the 0.01 level ($P < 0.0001$).

face interviews, although the original questionnaire is a self-rating instrument. This was due to the fact that there were a relatively considerable proportion of illiterate patients in the study. It is argued that face-to-face interviews may lead to social desirability bias particularly in sensitive areas such as assessment of mental health [8]. We do not know mode of administration through interviews how much affected the results. However, patients indicated that some questions were difficult to answer, especially items 10 and 11. Perhaps this was the reason why a weaker correlation was found for these items with their corresponding subscale. It seems that weaker correlation of items 10 and 11 would also be due to some problems of translation that might not be reached cross-cultural comparability with the original version of the questionnaire.

Similar to most studies reliability of the Iranian version of the HADS as measured by the internal consistency of the anxiety and the depression subscales was found to be satisfactory. However, there was a strong correlation between anxiety and depression subscales. One may argue that this is evidence to suggest that the instrument is a general measure of distress rather than a measure of anxiety and depression. In other words it is possible to suggest that because of the high correlation between the two HADS subscales it can be used as an unidimensional scale with a global score for the whole instrument (Table 3). A recent study in breast cancer patients concluded that the total score of the HADS is a valid measure of emotional distress and it can be used as a screening questionnaire for psychiatric disorders. The same study indicated that the use of the two subscales as a 'case identifiers' or as an outcome measure should be considered with caution [9]. In contrast, apart from findings from several studies that showed the HADS is a two-factor instrument [10], it has been suggested that inter-correlation between the anxiety and the depression subscales is not surprising since this is mainly due to a real coincidence of anxious and depressed symptoms and only to a lesser extent to inadequacies of the instrument [1].

The known groups comparison analysis indicated that the Iranian version of the HADS is a valid instrument for measuring anxiety and depression in breast cancer patients since the instrument was able to discriminate between patients who were clinically different. However, the striking finding from this preliminary validation study was that Iranian women with breast cancer showed a higher level of anxiety and a relatively lower level of depression. This may reflect the fact that the cut-off score would be different in Iranian cancer patients so further investigation might be necessary. Indeed the sensitivity analysis using an objective criteria or a gold standard test is needed to answer this question. Unfortunately the present study was limited in this respect.

As far as assessment of anxiety and depression in breast cancer patients is concerned studies have shown that the

HADS may result in under estimation of psychiatric morbidity among women with early stage breast cancer and therefore its utility for screening purposes in early stage breast cancer patients is limited [11,12]. In contrast, most of the exiting literature suggests that the HADS is a suitable instrument for measuring anxiety and depression in breast cancer patients [13,14].

The HADS anxiety and depression scores showed a negative but significant correlation with emotional functioning and global quality of life as was expected. This means that those who were more anxious or depressed showed lower levels of emotional functioning and global quality of life. Thus this could be regarded as additional evidence to suggest the HADS is a valid questionnaire. In a few validation studies usually concurrent validity analysis was applied using the correlation between the HADS and the Beck's Depression Inventory (BDI), or the General Health Questionnaire (GHQ), or the State-Trait Anxiety Inventory (SATI) [15–17]. However, since there was no an Iranian version of these questionnaires we used two subscales from the validated Iranian version of the EORTC QLQ-C30.

Conclusion

In summary, the findings from this preliminary validation study indicates that the Iranian version of the HADS is a reliable and valid measure of anxiety and depression and now it can be used in studies of quality of life in cancer patients. The next step is to use the questionnaire in different cancer patients or other chronic disease populations.

Authors' contribution

AM designed the study, analyzed the data, and wrote the paper. MV collected the data, and contributed to the study design. ME and SJ contributed to the translation procedure and data collection.

Competing interest

None.

List of abbreviations

HADS: Hospital Anxiety and Depression Scale; HADS-A: HADS anxiety subscale; HADS-D: HADS depression subscale; EORTC QLQ-C30: European Organization for Research and Treatment of Cancer Quality of Life Questionnaire; EF: Emotional functioning; QOL: Global quality of life; ICBC: Iranian Center for Breast Cancer

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