Reliability and Validity of a Nepali-language Version of the Hospital Anxiety and Depression Scale (HADS)

Risal A,^{1,2} Manandhar K,^{1,2} Linde M,^{2,3} Koju R,¹ Steiner TJ,^{2,4} Holen A^{2,5}

¹Dhulikhel Hospital, Kathmandu University Hospital Dhulikhel, Kavre, Nepal

²Department of Neuroscience Norwegian University of Science and Technology Trondheim, Norway

³Norwegian Advisory Unit on Headaches St Olavs University Hospital Trondheim, Norway

⁴Division of Brain Sciences Imperial College London, London, UK

⁵Pain Unit, St Olavs University Hospital Trondheim, Norway

Corresponding Author

Ajay Risal

Department of Psychiatry

Dhulikhel Hospital, Kathmandu University School of Medical Sciences,

Dhulikhel, Kavre, Nepal

E-mail: drajayrisal@gmail.com

Citation

Risal A, Manandhar K, Linde M, Koju R, Steiner TJ, Holen A. Reliability and Validity of a Nepali-language Version of the Hospital Anxiety and Depression Scale (HADS). *Kathmandu Univ Med J* 2015;50(2):115-24.

ABSTRACT

Background

In several languages and settings, the Hospital Anxiety and Depression Scale (HADS) has demonstrated reliable and valid screening properties in psychiatry.

Objective

To develop a Nepali version of HADS with acceptable reliability and construct validity for use among hospital patients and in the general population.

Method

The original English version was translated into Nepali using a forward-backward translation protocol. Psychometric properties were tested by factor analysis and Cronbach's alpha. The translated scale was administered to three groups of adult in-patients in a university hospital in three trials, and to a sample of adults from the community in a fourth trial. Some of the 14 items were reworded reiteratively to achieve viable semantic and statistical solutions.

Results

The two-factor solution with anxiety and depression subscales eventually explained 40.3% of the total variance. Cronbach's alpha was 0.76 for anxiety (HADS-A) and 0.68 for depression (HADS-D). All seven HADS-A items showed at least acceptable item-to-factor correlations (range 0.44-0.74), and full construct validity was achieved for this subscale. Item-to-factor correlations for six HADS-D items were also at least acceptable (range 0.42-0.70); one item (D4) had persistently low correlations throughout all trials, although construct validity was still satisfactory.

Conclusion

Reiterated rewording of items guided by statistical testing resulted in a Nepali version of HADS with satisfactory psychometric properties.

KEY WORDS

 $Item\,translation, psychometrics, psychopathology, screening, transcultural\,psychiatry.$

INTRODUCTION

Many studies have consistently shown high rates of anxiety and depression among patients with a long list of diverse medical conditions such as chronic obstructive pulmonary disease (COPD),^{1,2} cancer,³⁻⁶ HIV-AIDS,⁷ cardiac illnesses and end stage renal disease (ESRD).⁸⁻¹⁰ Identifying mental disorders in the background of medical conditions is important, particularly when the latter are chronic, because they may affect prognosis.¹¹

The Hospital Anxiety and Depression Scale (HADS), developed by Zigmond and Snaith in 1983, is recognised as a reliable, valid and practical tool in hospital populations for identifying and quantitatively evaluating the two most common mental health conditions. 12,13 Absence from the scale of items reflecting physical indicators, somatic symptoms or severe psychopathological symptoms makes HADS acceptable to both patients and non-patients. 14-16 Hence, it is an adequate psychiatric screening instrument. 14 It has also been found sensitive to changes in symptom severity and may thus serve as a predictor of the psychiatric aspect of somatic conditions. 12,17

Despite contrasting opinions about the factor structure of HADS^{6,10,12-15,18-24}; the bi-dimensional model encompassing anxiety and depression put forward by the original authors is the version that makes comparative psychiatric studies possible. ^{12,13,17,25}

In addition to hospital settings, HADS has been found useful for psychiatric screening in the general population. ^{15,16,18,19} It has been translated and recommended by researchers of various nations for large-scale prevalence studies. ^{14,15} However, no Nepali-language version of HADS has been published, so far.

Aims of study

Our objective was to develop a Nepali version of HADS for use among patients with somatic diseases as well as in the general population. We adopted a stepwise approach using different population samples, with item rephrasing and statistical checking of the psychometric properties at each step. It was our goal to keep the original bimodal or two-factor solution represented in anxiety and depression subscales. We aimed for internal consistencies expressed by Cronbach's alpha >0.6,26 and for sound construct validities demonstrated by items clustering statistically, as in the original version, with high inter-correlations between items within each subscale and low correlations to items of the other subscale. Furthermore, we sought to check whether employing the original screening thresholds would yield prevalence of anxiety and depression similar to those reported elsewhere in the world. 12,13 However, should this not be so, and we found major deviations, we would endeavour to establish different workable thresholds for the Nepali version.

METHODS

Ethics

This study was part of a larger research project addressing the major disorders of the brain in Nepal,²⁷ which had been approved by the Nepal Health Research Council (NHRC), the Institutional Review Committee of Kathmandu University School of Medical Sciences, Dhulikhel Hospital (IRC-KUSMS), and the Central Regional Committee for Health and Research Ethics in Norway. Informed consent was obtained from all participants indicated by signature or fingerprints.

HADS

The original, English version of HADS contains 14 items in two subscales: anxiety (HADS-A) and depression (HADS-D), each with seven items (A1 to A7; D1 to D7). Its administration is usually completed in 2-6 minutes.¹³ Each item is rated on a four-point scale from 0-3 (3 indicating maximum symptom severity), and the scores are summed (five items on the depression subscale and one on the anxiety subscale are reversed before summing).12 Each subscale therefore has a summed score with a potential range from 0 to 21. As for the thresholds of the original English version, a summed score of ≥11 on either subscale indicates caseness with regard to the relevant psychiatric morbidity. Summed scores from 8-10 are "borderline" cases, and 0-7 signifies the normal range. 12,13,28 Both Western and non-Western studies have used these thresholds in estimating the prevalence of anxiety and depression, 4,5,23,29-31 but few studies have re-evaluated whether the prevalence rates are reasonable in their cultural context.

Participants and procedures

Three samples of hospital patients were recruited by convenience sampling. The first included COPD patients admitted to Dhulikhel Hospital (N=84; males 43, females 41). The second also consisted of COPD patients (N=73; males 30, females 43). The third (N=110; males 38, females 72) enrolled 100 patients with COPD but also seven with diabetes mellitus and three with cancers. A fourth study enrolled a representative sample (N=210) of the adult general population, randomly selected and contacted by door to door survey of three convenience-selected localities in the Kavre district, two rural and one urban. 32

Translation and cultural adaptation

HADS was first translated from the original English into Nepali using a forward-backward translation method.³³ The cultural and semantic adaptation of the items was done in two stages. First, the metaphors that are not in use in Nepali were replaced. Second, statistical explorations by means of factor analyses with the principal component extraction and internal consistency computations were carried out to identify items with poor fit in relation to their original subscales. In any such instance, the verbal content of the item was modified, and the item retested in a new

population. The process was continued until an acceptable overall fit was achieved for both subscales.

Data analysis

The data were analyzed using SPSS-20. For each trial, factor analysis with the principal component analysis was done with a Varimax rotation to explore how the items were distributed in relation to the original set of items in both the anxiety and depression subscales. We aimed for correlations of ≥0.40. Cronbach's alpha was employed as a reliability measure.²⁶ Construct or criterion validity was sought by simple counting of how many of the seven items concurred with the original English distribution of anxiety and depression items. If all seven items in Nepali of HADS-A correlated well with the anxiety factor, and at the same time correlated less well with the depression factor, our criterion validity was achieved; the reverse applied for the seven items of HADS-D. In our efforts to improve reliability and construct validity and to optimize the psychometric properties of the two subscales, several steps of rephrasing selected items were made. Changing one or more items led to changes in the correlations of the remaining items, demanding several steps of re-adjustments.

RESULTS

Changing metaphors

We encountered two major difficulties when adapting the original English version of HADS to Nepali. The fifth anxiety item (A5: I get a sort of frightened feeling like butterflies in stomach) was challenging: the metaphor butterflies in stomach has no corresponding idiom associated with anxiety in Nepali. Accordingly, a literal translation was not appropriate. In Nepali, it was first reformulated into heart shivering terribly out of fear (ma dar lagera mutu siringa gariraheko anubhav gardachhu).

A similar problem arose with the fifth depression item (D5: I have lost interest in my appearance). The word appearance in Nepali has many uses; it was difficult to pinpoint which of them would be understood in the same way as in English. After thorough discussion with the translators, it was decided that appearance needed to signify facial appearance (ma afno rangarupama ruchi rakhdina).

Item changes after statistical explorations

Attempts at rewording items as a result of low correlations in the statistical explorations of the three hospital trials and the general population study are presented in Table 1. Those items with poor correlations were reworded in the subsequent trials.

Below, we report some of the details from the work in each of the four trials.

Hospital studies

First trial

Correlations of ≥0.40 were obtained on 12 of the 14 items in the first trial, with Cronbach's alpha of 0.83 for anxiety and 0.72 for depression. The two-factor solution explained 47% of the variance. However, correlations were inadequate for A5 and D5: A5 showed better correlation with depression and D5 with anxiety.

First modification

Item A5 was reworded to incorporate the affective component (feeling) of fear, so the *heart shivering* was replaced with *trembling of mind due to fear*.

Considering that the wording of D5 might not have emphasized sufficiently the anhedonia component of depression, we modified it to indicate decrease *in the interest of facial appearances*. While changing item D5, we anticipated some negative effect on other depression items as well, so we modified D3 (*I feel cheerful*), giving more emphasis to feelings of *cheer* rather than simple *cheerfulness* as in the earlier version.

Second trial

In the second trial, only one anxiety item (A1) but five depression items (D2, D3, D4, D5, D7) showed low correlations. Cronbach's alpha was good (0.82) for anxiety but unacceptably low for depression (0.45). The two-factor solution explained 42% of the variance.

Second modification

Based on the initial outcome of the second trial, we thought A1 (I feel tense or 'wound up') would probably benefit from more emphasis on the anxiety part. Similarly, for D2 (I can laugh and see the funny sides of things), we incorporated a sense of humour, and for D3, we aimed for more positive emotions. We decided D4 (I feel as if I am slowed down) would require documenting less energy, and D5 should demonstrate a broader aspect of appearance. D7 (I can enjoy a good book or radio or a TV programme) also needed change to capture the typical kinds of entertainment and recreational activities of Nepalis. Therefore the items were revised as follows (Nepali translations within parenthesis):

A1: I feel tense and close to a breaking point (ma afulai tanabma pauchhu)

D2: I have a good sense of humour; I often see the funny side of things (ma kunai pani kurako ramailo pakchhalai dekhera hasna sakchhu)

D3: I feel happy and positive (ma anandit mahasus garirahechhu)

D4: I have much less energy for getting things done (ma sharirma jangar nabhaeko mahasus gardachhu)

D5: I have lost interest in how I look and in how I dress and in the things around me (mero lawaikhawaima ruchi ghatirahechha)

D7: I can enjoy social chat, radio, books, TV and video programs (ma gafgaaf, radio, kitab, TV, videojasta karyakramma ramauchhu)

Table 1. Item-to-factor correlations from reiterative factor analyses of HADS items translated into Nepali (items tested on three hospital samples and one from the general population)

Items	Text of items	Correlations with factor containing anxiety or depression items			
		Hospital samples			General
		First trial (N=84)	Second trial (N=73)	Third trial (N=110)	population sample (N=210)
A1	I feel tense or 'wound up' a) Ma afulai chintit pauchhu b) Ma afulai tanabma pauchhu	0.75	0.38	0.64	0.67
D1	I still enjoy the things I used to enjoy a) Ma ajhai pani afulai man parne chijma khushi pauchhu	0.46	0.60	0.60	0.52
A2	I get a sort of frightened feeling as if something awful is about to happen a) Ma kehi darlagdo ghatana ghatla ki bhanera darauchhu	0.65	0.73	0.75	0.63
D2	I can laugh and see the funny sides of things a) Kunai hasouthdo kuro dekhepachhi ma hasna sakchhu b) Ma kunai pani kurako ramailo pakchhyalai dekhera hasna sakchhu	0.70	0.31	0.82	0.59
А3	Worrying thoughts go through my mind a) Chintajanak bicharharu mero dimagma auchhan	0.70	0.72	0.76	0.71
D3	I feel cheerful a) Ma khushi hunchhu b) Ma afulai khsuhi anubhav garirahechhu c) Ma anandit mahasus garirahechhu Alternative c) Ma afulai santushta anubhav gariraheko chhu	0.72	0.55	0.66	0.39 0.42
A4	I can sit at ease and feel relaxed a) Ma dhukka ebam nishchinta basna sakchhu	0.63	0.66	0.49	0.44
D4	I feel as if I am slowed down a) Ma shithil bhaeko mahasus gardachhu b) Ma sharirma jangar nabhaeko mahasus gardachhu	0.33	0.49	0.40	0.34
A5	I get a sort of frightened feeling like butterflies in stomach a) Ma dar lagera mutu siringa gariraheko anubhav gardachhu b) Ma dar lagejasto bhaera man siringa gariraheko anubhav gardachhu	0.32	0.79	0.67	0.66
D5	I have lost interest in my appearance a) Ma afno rangarupama ruchi rakhdina b) Mero afno rangarupama ruchi ghatiraheko chha c) Mero lawaikhawawima ruchi ghatirahechha	0.42	0.33	0.22	0.63
A6	I feel restless as I have to be on the move a) Ma sadhai chhatpati/ ashanta jasto anubhav gardachhu	0.59	0.65	0.81	0.74
D6	I look forward with enjoyment to things a) Ma jahile pani ramailo garna manoranjanko pratikshyama hunchhu	0.84	0.75	0.79	0.70
A7	I get sudden feelings of panic a) Ma kahilekahi ekdamai attalinchhu	0.70	0.77	0.72	0.51
D7	I can enjoy a good book or radio or a TV program a) Ma ramro kitab, radio athawa TV karyakramma ramauchhu b) Ma gafgaaf, radio, kitab, TV, videojasta karyakramma ramauchhu	0.71	0.56	0.40	0.59
Explained variance (%) Cronbach's alpha of anxiety items Cronbach's alpha of depression items		47.11 0.83 0.72	42.42 0.82 0.45	45.67 0.85 0.62	40.31 0.76 0.68* 0.62†

a), b), c) etc indicate consecutive changes to Nepali versions; *when D3 is 'I feel satisfied'; \dagger when D3 is 'I feel cheerful'

Table 2. Frequency and percentage (with 95% CI) of anxiety and depression cases in various trials with the HADS-Nepali version using the same thresholds as the original English version

HADS subscale	Thresholds	Но	spital-based trials	General population study	
		First trial (N=84) n (%) [95%CI]	Second trial (N=73) n (%) [95%CI]	Third trial (N=110) n (%) [95%CI]	(N=210) n (%) [95%Cl]
HADS-A	No anxiety (0-7)	23 (27.4) [17.86-37.94]	33 (45.2) [33.78-56.62]	43 (39.1) [29.98-48.22]	135 (64.3) [57.82-70.78]
	Borderline anxiety (8-10)	23 (27.4) [17.86-37.94]	16 (21.9) [12.41-31.39]	30 (27.3) [18.97-35.63]	52 (24.8) [18.96-30.64]
	Anxiety caseness (≥11)	38 (45.2) [34.56-55.84]	24 (32.9) [22.12-43.68]	37 (33.6) [24.77-42.43]	23 (11.0) [6.77-15.23]
HADS-D	No depression (0-7)	20 (23.8) [14.69-32.91]	16 (21.9) [12.41-31.39]	19 (17.4) [10.32-24.48]	135 (64.3)* [57.82-70.78]* 129 (69.4)† [63.17-75.63]†
	Borderline depression (8-10)	30 (35.7) [25.45-45.95]	33 (45.2) [33.78-56.62]	42 (38.5) [29.41-47.58]	52 (24.8)* [18.96-30.64]* 58(27.6)† [21.55-33.65]†
	Depression caseness (≥11)	34 (40.5) [30.00-51.00]	24 (32.9) [22.12-43.68]	48 (44.1) [34.82-53.38]	23 (11.0)* [6.77-15.23]* 23(11.0)† [6.77-15.23]†

^{*}D3: "I feel cheerful"; †D3: "I feel satisfied"

Third trial

There was a slight improvement in the internal consistency, but Cronbach's alpha was relatively low for depression (0.62; for anxiety 0.85). The two factors, however, now explained 46% of the variance.

Third modification

For depression, we decided to use those items with the highest correlations in the three prior trials. Earlier versions of D4 and D5 had better correlations, so those were kept. In D3, the term cheerful (anandit) had less association with the inverted notion of anhedonia so it was replaced with satisfaction (santushta). Later, we decided to test both anandit and santushta in two alternative versions of D3 to check which of the two had the higher correlation with the depression-related factor. We maintained D7 unchanged and decided to observe it in the general population study. Since the anxiety items showed acceptable correlations, no further changes were made to them.

General population study

In the general population sample, the anxiety items maintained their good score (Cronbach's alpha=0.76), and there was a satisfactory improvement in the depression items. In D3, satisfaction (santushta) gave an acceptable Cronbach's alpha of 0.68 whereas cheerful (anandit) gave 0.62; accordingly, we kept the former. All of the HADS-A items showed item-to-factor correlations in the range 0.44-0.74. Except for D4, all HADS-D items showed item-to-factor correlations in the range 0.42-0.70.

Screening thresholds

Table 2 illustrates the results of the screening for definite and borderline cases of anxiety and depression by using the final Nepali version, but applying the thresholds of the original English version. Their prevalence in Nepal was comparable to those found in studies of various population samples elsewhere using both English and non-English versions of HADS (see Table 4). Accordingly, we decided to keep the original thresholds for caseness of both anxiety and depression for the Nepali version.

DISCUSSION

Through several trials in diverse samples, and applying both semantic and statistical methods, we arrived at a Nepali version of HADS that coincided well with the original English version while maintaining its two-factor solution. The challenges were not simply linguistic, although these were considerable because of the highly metaphorical language of the original, but also very much cultural, which was to be expected. All anxiety items showed acceptable correlations, and there was a good internal consistency between them. One of the depression items (D4) persistently correlated better with anxiety than with depression despite several rewordings. Internal consistency between the depression items was nonetheless acceptable. Internal consistency was reflected in an acceptable construct validity. In our view, the translation of the two HADS subscales into Nepali is good for anxiety and acceptable for depression; it is able to capture symptom severity and to serve as a screening

Table 3. Reliability and validity studies in various languages of HADS

Language of translation	Participants		Cronbach's α		Explained variance (when given) (%)
	N	Physical illness	HADS- A	HADS- D	
Japanese ³⁴	128	Cancer (head and neck, pulmonary)	0.77	0.79	
Chinese (Cantonese) ³⁷	93	In-patient referrals	0.77	0.82	42.1
Chinese (Mandarin) ⁸	314	Coronary heart disease	0.79	0.79	53
Malayalam ³¹	240	Cancer	0.81	0.71	
Persian (Iranian) ³⁰	167	Breast cancer	0.78	0.86	
Arabic ³⁶	217	Primary health- care patients	0.78	0.88	
Norwegian ¹⁸	51,930	General popula- tion (HUNT survey)	0.80	0.76	57
Spanish ³⁸	385	General medi- cal out-patients	0.85	0.84	53.2
Greek ²⁹	521	246 medical or surgical patients 275 controls	0.89	0.84	
Ethiopian/ Amharic ²¹	302	HIV/AIDS	0.78	0.76	40

instrument for anxiety and depression cases when applying the original thresholds.

The internal consistencies of both HADS-A and HADS-D in the general population sample were comparable to those of other translations from non-Western countries (Table 3). Generally, the HADS anxiety sub-scales tend to obtain better psychometric properties than depression sub-scales in hospital as well as in general population trials. In the Nepali version, items distributed within the two-factor solution exactly as in the original English-language version with one exception in the depression subscale (item D4). Correlations of some depression items towards anxiety have also been observed in the Malayalam translation,³¹ with the authors claiming that "early anhedonia" may be expressed in the form of anxiety by people in the East. The anxiety item A4 (I can sit at ease and feel relaxed) has been found to have a similarly poor correlation with anxiety both in Eastern, 30,34 and Western studies. 18,23 A review of the validity of HADS also found this weak relationship.15 However, a study of cancer patients claimed item A4 correlated well with both anxiety and depression²⁴; the authors tried to explain this by linking it to the multidimensional nature of depression. Likewise, A5 has been found problematic in many Asian translations: Iranian,30 Malayalam,31 Urdu and Arabic.35,36 In contrast to our experience with the Nepali version, terms like panic (A7) and to be on the move (A6) were found problematic in their translations. 31,35,36 Complications

Table 4. Prevalence of anxiety and depression (probable or definite) according to various versions of HADS

Language	Sample (N)	Prevalence of anxiety		Prevalence of depression		
		HADS-A thresholds	%	HADS-D thresholds	%	
English ²³	Cancer patients (1,474)	"possible" (>8)	33.3	"possible"(>8)	19.8	
Norwegian ⁴	Cancer patients (716)	probable (8-10) definite (≥11)	18 13	probable (8-10) definite (≥11)	11 9	
English ⁵	Cancer patients (809)	probable (8-10) definite (≥11)	23.6 17.7	probable (8-10) definite (≥11)	13 9.9	
Greek ²⁹	Patients (246) and controls (275)	probable (8-10) definite (≥11)	16.3 15.1	probable (8-10) definite (≥11)	14.2 13.4	
Malayalam ³¹	Cancer patients (240)	probable (8-10) definite (≥11)	11 8	probable(8-10) definite (≥11)	13 7.6	

of this kind seem unavoidable when translating English metaphors and everyday language into other languages without similar semantic constructs.^{31,35}

Psychiatric symptoms related to anxiety and depressions appear to be universal and present in various degrees in every population. These so-called non-psychotic illnesses tend to be distributed in the community along a continuum, with a point that separates caseness from noncaseness. To accommodate uncertainty, two boundaries define a "borderline" area; above the upper boundary are definite cases; below the lower are non-cases. HADS, as a screening instrument, applies threshold scores marking these boundaries. 12,39 We found ample reasons to keep the same threshold scores for the Nepali version as those proposed by the original authors of HADS. 12,13 Doing so, we obtained prevalence estimates for borderline and definite depression and anxiety cases among our hospital patient and general population groups comparable to those found in other studies, three with the non-English versions (Table 4). In order to maintain a high level of specificity, 12,39 we recommend maintaining the threshold score of ≥11 to designate caseness for both anxiety and depression. In other words, there is support for keeping the original thresholds and using them in the Nepali version of HADS, which thus can serve as a case-finding instrument among hospital patients as well as in the general population. This being so, and since our Nepali version of HADS demonstrates both acceptable reliability and acceptable construct validity,26 we have achieved the principal goal of this study (see Appendix for the Nepali scale in Devanagari script). Nevertheless, it should be kept in mind that HADS is primarily a screening instrument,14 and is not sufficient for making specific diagnoses of anxiety and depressive disorders. In psychiatric practice, this is possible only by face-to-face diagnostic interviews.

Still, there were some limitations to the study. The populations studied in each trial were small. The hospital samples were not randomized but recruited by convenience, although the final general population sample was randomly selected and representative.³² However, the testing of several samples and the step-wise modifications process may have reduced this risk, and have resulted in robust findings, and thus augmented the strength of the two subscales. Owing to time and personnel constraints, we did not attempt a validation against well-trained consultant psychiatrists' expert clinical diagnosis. Accordingly, the sensitivity and specificity of the Nepali version of HADS await investigation. Likewise, time and resource limitations prevented us from carrying out a test-retest study with brief intervals of a week or less, which is desirable to establish an even broader foundation for the psychometric qualities of our Nepali version. We should point out that HADS is essentially a self-rating instrument, whereas it was administered in our study as a structured interview. This was justified - in fact necessary - because many of the participants were illiterate.40 While we presume this was not in itself disadvantageous, arguably it would not impair the basis for comparison with other studies.

Our reformulations of items, driven by our seeking an optimal fit with the two-factor solution, may have followed shifts in the concepts of "anxiety" and "depression" away from their original formulations. This would have been against our intentions, but a consequence of the process of adapting a psychiatric screening instrument for application in an entirely different culture. 31,35

There are studies suggesting factor solutions to HADS other than the bimodal one. A French study,⁶ and one more recently from Ethiopia,²¹ both found single-factor solutions, while two other studies supported a tripartite structure importing a "general distress factor" in addition to the two specific anxiety and depression (anhedonia) factors.^{19,22} One study of patients with chronic renal disease,¹⁰ even found four factors, adding "body image" and "self-perception" to anxiety and depression. None of these studies looked at the prevalence of anxiety and depression in the general population. When studies propose a factor structure

deviating considerably from the two-factor solution, the statistical concepts relating to anxiety and depression may no longer coincide well with the original, and comparing prevalence becomes difficult. Moreover, poor translations of some items might lie behind findings of only one or more than two factors, making them entirely spurious. Conversely, it may be that the original bimodal concept of HADS is not universal: cultural variations may exist, and become apparent when it is used.

This study was based on the assumption that anxiety and depression are universal psychiatric phenomena, distributed more or less similarly among human beings in all parts of the world. Even so, these expressions of human suffering may have local variations without violating the overriding assumption of their ubiquity and universality.

CONCLUSION

By using a stepwise translation, trial and modification process that involved semantic and statistical approaches, an acceptably reliable and valid bi-modal Nepali version of HADS has been achieved that will serve as a psychiatric measure of symptom severity and as a screening instrument for case-finding. It meets psychometric requirements for use both among hospital patients and in the general population.

ACKNOWLEDGEMENTS

This project has been funded by grants from Samarbeidsorganet, which is the Norwegian name for the Liaison Committee between the Central Norway Regional Health Authority and the Norwegian University of Science and Technology (NTNU). The study is a research collaboration between NTNU Department of Neuroscience, Kathmandu University School of Medical Sciences (KUSMS), and Lifting The Burden, a UK-registered non-governmental organization directing the Global Campaign against Headache in official relations with the World Health Organization. We thank Dhulikhel Hospital, Kathmandu University Hospital, for assistance and logistic support during the planning phase.

REFERENCES

- Karajgi B, Rifkin A, Doddi S, Kolli R. The prevalence of anxiety disorders in patients with chronic obstructive pulmonary disease. Am J Psychiatry. 1990;147(2):200-1.
- Mikkelsen RL, Middelboe T, Pisinger C, Stage KB. Anxiety and depression in patients with chronic obstructive pulmonary disease (COPD). A review. Nord J Psychiatry. 2004;58(1):65-70.
- Ibbotson T, Maguire P, Selby P, Priestman T, Wallace L. Screening for anxiety and depression in cancer patients: the effects of disease and treatment. Eur J Cancer. 1994;30a(1):37-40.
- Aass N, Fossa SD, Dahl AA, Moe TJ. Prevalence of anxiety and depression in cancer patients seen at the Norwegian Radium Hospital. Eur J Cancer. 1997;33(10):1597-604.
- Carroll BT, Kathol RG, Noyes R, Jr., Wald TG, Clamon GH. Screening for depression and anxiety in cancer patients using the Hospital Anxiety and Depression Scale. Gen Hosp Psychiatry. 1993;15(2):69-74.
- Razavi D, Delvaux N, Farvacques C, Robaye E. Screening for adjustment disorders and major depressive disorders in cancer in-patients. Br J Psychiatry. 1990;156:79-83.
- 7. Chandra PS, Ravi V, Desai A, Subbakrishna DK. Anxiety and depression among HIV-infected heterosexuals--a report from India. *J Psychosom Res.* 1998;45(5):401-9.
- Wang W, Chair SY, Thompson DR, Twinn SF. A psychometric evaluation of the Chinese version of the Hospital Anxiety and Depression Scale in patients with coronary heart disease. J Clin Nurs 2009;18(13):1908-15.

- Bambauer KZ, Locke SE, Aupont O, Mullan MG, McLaughlin TJ. Using the Hospital Anxiety and Depression Scale to screen for depression in cardiac patients. Gen Hosp Psychiatry. 2005;27(4):275-84.
- Martin CR, Thomson DR. Utility of the Hospital Anxiety and Depression Scale in patients with end-stage renal disease on continuous ambulatory peritonial dialysis. *Psycholoogy, Health & Medicine*. 1999;4(4):369-76.
- 11. Shepherd M, Davies B, Culpan RH. Psychiatric illness in a general hospital. *Acta Psychiatr Scand*. 1960;35:518-25.
- 12. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand. 1983;67(6):361-70.
- 13. Snaith RP. The Hospital Anxiety And Depression Scale. *Health Qual Life Outcomes*. 2003;1:29.
- Herrmann C. International experiences with the Hospital Anxiety and Depression Scale--a review of validation data and clinical results. J Psychosom Res. 1997;42(1):17-41.
- 15. Bjelland I, Dahl AA, Haug TT, Neckelmann D. The validity of the Hospital Anxiety and Depression Scale. An updated literature review. *J Psychosom Res.* 2002;52(2):69-77.
- Abiodun OA. A validity study of the Hospital Anxiety and Depression Scale in general hospital units and a community sample in Nigeria. Br J Psychiatry. 1994;165(5):669-72.
- 17. Snaith RP. The concepts of mild depression. *Br J Psychiatry*. 1987;150:387-93.
- Mykletun A, Stordal E, Dahl AA. Hospital Anxiety and Depression (HAD) scale: factor structure, item analyses and internal consistency in a large population. Br J Psychiatry. 2001;179:540-4.
- Dunbar M, Ford G, Hunt K, Der G. A confirmatory factor analysis of the Hospital Anxiety and Depression scale: comparing empirically and theoretically derived structures. Br J Clin Psychol. 2000;39(Pt 1): 79-94.
- Chaturvedi SK. Clinical irrelevance of HAD factor structure. Br J Psychiatry. 1991;159:298.
- 21. Reda AA. Reliability and validity of the Ethiopian version of the hospital anxiety and depression scale (HADS) in HIV infected patients. *PLoS One.* 2011;6(1):e16049.
- 22. Clark LA, Watson D. Tripartite model of anxiety and depression: psychometric evidence and taxonomic implications. *J Abnorm Psychol.* 1991;100(3):316-36.
- 23. Smith AB, Selby PJ, Velikova G, Stark D, Wright EP, Gould A, et al. Factor analysis of the Hospital Anxiety and Depression Scale from a large cancer population. *Psychol Psychother.* 2002;75(Pt 2):165-76.
- 24. Moorey S, Greer S, Watson M, Gorman C, Rowden L, Tunmore R, et al. The factor structure and factor stability of the hospital anxiety and depression scale in patients with cancer. *Br J Psychiatry*. 1991;158:255-9.

- 25. Snaith RP, Baugh SJ, Clayden AD, Husain A, Sipple MA. The Clinical Anxiety Scale: an instrument derived from the Hamilton Anxiety Scale. *Br J Psychiatry*. 1982;141:518-23.
- Nunally J, Bernstein I. Psychometric Theory. New York: McGraw-Hill; 1994.
- 27. Risal A, Manandhar K, Steiner TJ, Holen A, Koju R, Linde M. Estimating prevalence and burden of major disorders of the brain in Nepal: cultural, geographic, logistic and philosophical issues of methodology. *J Headache Pain*. 2014;15(1):51.
- 28. Snaith RP, Taylor CM. Rating scales for depression and anxiety: a current perspective. *Br J Clin Pharmacol.* 1985;19 Suppl 1:17s-20s.
- Michopoulos I, Douzenis A, Kalkavoura C, Christodoulou C, Michalopoulou P, Kalemi G, et al. Hospital Anxiety and Depression Scale (HADS): validation in a Greek general hospital sample. *Ann Gen Psychiatry*. 2008;7:4.
- 30. Montazeri A, Vahdaninia M, Ebrahimi M, Jarvandi S. The Hospital Anxiety and Depression Scale (HADS): translation and validation study of the Iranian version. *Health Qual Life Outcomes*. 2003;1:14.
- Thomas BC, Devi N, Sarita GP, Rita K, Ramdas K, Hussain BM, et al. Reliability & validity of the Malayalam hospital anxiety & depression scale (HADS) in cancer patients. *Indian J Med Res.* 2005;122(5):395-9.
- 32. Manandhar K, Risal A, Steiner TJ, Holen A, Koju R, Linde M. Estimating the prevalence and burden of major disorders of the brain in Nepal: methodology of a nationwide population-based study. *J Headache Pain*. 2014;15(1):52.
- 33. Peters M. Translation Protocols. *Journal of Hedache and Pain.* 2007;8:S40-S2.
- Kugaya A, Akechi T, Okuyama T, Okamura H, Uchitomi Y. Screening for psychological distress in Japanese cancer patients. *Jpn J Clin Oncol*. 1998;28(5):333-8.
- Mumford DB, Tareen IA, Bajwa MA, Bhatti MR, Karim R. The translation and evaluation of an Urdu version of the Hospital Anxiety and Depression Scale. Acta Psychiatr Scand. 1991;83(2):81-5.
- 36. el-Rufaie OE, Absood GH. Retesting the validity of the Arabic version of the Hospital Anxiety and Depression (HAD) scale in primary health care. *Soc Psychiatry Psychiatr Epidemiol*. 1995;30(1):26-31.
- 37. Leung CM, Wing YK, Kwong PK, Lo A, Shum K. Validation of the Chinese-Cantonese version of the hospital anxiety and depression scale and comparison with the Hamilton Rating Scale of Depression. *Acta Psychiatr Scand.* 1999;100(6):456-61.
- 38. Herrero MJ, Blanch J, Peri JM, De Pablo J, Pintor L, Bulbena A. A validation study of the hospital anxiety and depression scale (HADS) in a Spanish population. *Gen Hosp Psychiatry.* 2003;25(4):277-83.
- 39. Williams P, Tarnopolsky A, Hand D. Case definition and case identification in psychiatric epidemiology: review and assessment. *Psychol Med.* 1980;10(1):101-14.
- Nepal Population Report 2011. Kathmandu, Nepal: Govenment of Nepal, Ministry of Health and Population, Population Division; 2011.

सुचित मञ्जुरीनामा पत्र

नेपालीमा रूपान्तरित HADS नामक मनोरोग अन्वेषण सामाग्रीको विश्वसनीयता परीक्षणका लागि यो अध्ययन गर्न लागिएको छ । यस अध्ययनले नेपाली अन्वेषण सामाग्रीका विकासका लागि सघाउ पुऱ्याउनेछ । HADS को माध्यमबाट तपाईमा भएको "Anxiety" र "Depression" को मात्रा यिकन गर्न सिकन्छ ।

निम्निलिखित १४ प्रश्नहरुमा प्रत्येक प्रश्नका दिइएका चार संभावित उत्तरहरुमध्ये तपाईलाई सुहाउँदो कुनै एक उत्तरमा चिन्ह लगाउनुपर्नेछ । प्रत्येक प्रश्नको उत्तर तुरुन्त नै दिनुपर्नेछ र उत्तरका लागि लामो समयसम्म विचार गर्नु आवश्यक छैन । तपाईको यथासमयमा रहेको भावना नै प्रत्येक उत्तरले प्रतिविम्बित गर्नुपर्नेछ । यसको उत्तर दिंदाखेरी बिगत एकहप्तायताको तपाईको मनस्थिति एवं भावनाहरुको प्रतिनिधित्व हुने गरी विचार पुऱ्याउनुहोला ।

तपाईले प्रदान गर्नुभएको जुनसुकै उत्तर पिन गोप्य रहनेछ र यसलाई वर्तमान अध्ययन कार्यबाहेक अरु केहीमा पिन प्रयोग गरिने छैन ।

यदि तपाई यस अध्ययन कार्यमा सरीक हुन चाहनुहुन्छ भने कृपया तलको हरफ पढेर आफ्नो नाम लेखी सहीछाप गरिदिनुहोला। तपाईको सहयोगका लागि हार्दिक धन्यवाद।

"मैले यस अध्ययनका बारेमा दिइएको जानकारी पढेको छु र बुभेको पिन छु । यो अध्ययनमा सहभागीताका लागि आफ्नै स्विविवेकमा मञ्जुरी प्रदान गर्दछु । मलाई यो बताइएको छ कि जुनसुकै समयमा पिन यस अध्ययनलाई कुनै कारण निदइकनै परित्याग गर्नसक्नेछु ।"

सहीछाप-औंठाछाप (निरक्षरका लागि मात्र)-सहभागीको नाम-साक्षी-मिति-

Nepali version of the Hospital Anxiety Depression Scale (HADS-Nepali)

A,- म आफूलाई तनावमा पाउँछु:

- ३. प्रायःजसो
- २. धेरै पटक
- १. समय समयमा
- ०.कहिल्यै पनि हन्नाँ

$D_{\scriptscriptstyle 1}$ - म अभौ पनि आफूलाई मन पर्ने चीजमा खुशी पाउँछु:

- ०. पक्कै पनि धेरैपटक
- १. त्यत्ति धैरे होइन
- २. अलि अलि
- ३. कहिल्यै पनि हुन्नँ/बिरलै

A_γ - म केही डरलाग्दो घटना घटला कि भनेर डराउँछु:

- ३. एकदमै नराम्रो सँग
- २. हो, तर त्यति नराम्रोसँग होइन
- १. अलि अलि तर त्यत्ति चिन्तित गराउँदैन
- ०. पटक्कै लाग्दैन

D_{γ} - म कुनै पनि कुराको रमाइलो पक्षलाई देखेर हाँस्न सक्छुः

- ०. पहिले जित नै
- १. अहिले त्यत्ति धेरै होइन
- २. पक्कै तर पहिले जस्तो होइन
- ३. हँदै हन्नँ

A₃- चिन्ताजनक विचारहरु मेरो दिमागमा आउँछन्:

- ३. अत्यधिक मात्रामा
- २. धेरैजसो
- 9. कहिलेकाहीं तर त्यति धेरै आउँदैन
- ०. बिरलै

D_3 - म आफूलाई सन्तुष्ट अनुभव गरिरहेको छु:

- ३. कहिल्यै पनि हुन्नँ
- २. प्रायः हुन्नँ
- 9. कहिलेकाहीं
- ०. धेरैजसो समय

A_{4} - म ढुक्क एवं निश्चिन्त बस्न सक्छु:

- पक्कै पनि/अवश्य
- १. प्रायःजसो
- २. कहिलेकाहीं
- ३. हुँदै हुन्नँ

D_4 - म शिथिल भएको महसुस गर्दछु:

- ३. प्रायः सँधैजसो समय
- २. बारम्बार
- १. कहिलेकाहीं
- ०. कहिल्यै पनि ह्न्नाँ

\mathbf{A}_{ε} - म डर लागेजस्तो भएर मन सिरिङ्ग गरिरहेको अन्भव गर्दछ:

- ०. कहिल्यै पनि होइन
- 9. कहिलेकाहीं
- २. अत्यधिक मात्रामा
- ३. सँधैंजसो

D - मेरो आफ्नो रंगरुपमा रुचि घटिरहेको छ:

- ३. अवश्य नै
- २. जित लिनुपर्ने हो त्यति लिन्न
- १. त्यत्ति रुचि नदिन सक्छु
- ०. पहिले जस्तै चासो राख्छु

${f A}_{\! 6}$ - म सधैं छटपटी / अशान्त जस्तो अनुभव गर्दछु:

- ३. वास्तवमा धेरै नै
- २. अलि बढी
- १. त्यत्ति बढी होइन
- ०. हुँदै होइन

D_{ϵ} - म जिहले पनि रमाइलो $\sqrt{100}$ मनोरञ्जनको प्रतीक्षामा हुन्छुः

- ०. पहिले जस्तो नै
- १. पहिले भन्दा अलि कम
- २. पक्कै पनि पहिले भन्दा थोरै
- ३. कहिल्यै पनि होइन

A_{γ} - म कहिलेकाहीं एकदमै अत्तालिन्छुः

- ३. वास्तवमा धेरै नै
- २. प्रायः जसो
- १. त्यति धेरै होइन
- ०. हुँदै होइन

D_7 - म गफगाफ, रेडियो, किताब, टि.भी, भिडियोजस्ता कार्यक्रममा रमाउँछु:

- ०. प्राय:
- १. कहिलेकाहीं
- २. त्यत्ति धेरै होइन
- ३. बिरलै