

A validation study of the Hospital Anxiety and Depression Scale (HADS) in WLHIV

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Abstract

Background

Hospital Anxiety and Depression Scale (HADS) is a self-assessment tool that measures anxiety and depression and is mostly used in hospital settings. The purpose of this study is to test the validity and reliability of the Somali version of HADS in selected two hospitals in eastern Ethiopia.

Method:

From the WLHIV who attend the ART service, 357 women were included in the study and assessed with this tool. The English language of HADS was translated into the Somali version and used for this study. Statistical analysis was computed to examine the validity and measure the reliability of the study.

Result

This version of HADS was found to be acceptable for people living with HIV. To test the reliability, the internal consistency was found to be 0.83 for the anxiety sub-scale and 0.84 for the depression sub-scale. The Somali version of HADS has shown good internal consistency with its metric properties similar to international literature. By two-factor analysis, the Varimax rotation has shown high factor loading in both sub-scales (Anxiety and depression).

Conclusion

Therefore, this version can be used to screen the anxiety and depression of patients living with HIV. Therefore, the findings of this validation study show that the Somali version of the HADS is a valid and reliable tool to measure depression and anxiety and can be used to screen people living with HIV.

Background

It is well known that screening enhances the detection, and management of patients with anxiety and depression (1–6), the validation of the important psychometric properties of the practical tools concerning the performance is considerable (7–12). Recently, there is emerging evidence that indicates the association between delaying the screening of patients and the development of common mental disorders like anxiety and depression (13). Thus, the introduction of an appropriate and sound tool for screening depression among high-risk groups would minimize their missing opportunity and drop-out from proper interventions.

Despite, the provider-client interaction would improve the opportunity for screening (14, 15), one of the main barriers include the absence of a reliable and culturally contextualized measurement tools in some

health facilities in low-income countries (16). The other possible negative consequence of failure to examine the emotional stability of chronic patients and detect depression in early stages includes lack of getting standard treatment or defaulting the medications.

Despite, many health sectors identify depression screening practice as an important component of the service (17), yet it not practiced in most of the health institution resource-constrained regions. This is one of the main gaps often observed in service entry points of most health facilities where depression remains unnoticed and not detected (18). Some of the gaps are associated with the readiness and practice of the providers, but most importantly the availability of validated tools exists to be a barrier. Based on these challenges on the ground, the limited patient screening service is known to intensify failure to enrol a large proportion of PLHIV to mental health and hence suffer from emotional and psychological disturbance. In such circumstances, numerous low-income countries were well-known for their lack of depression screening in HIV care set-up. As reported in one of the studies in Malawi (19) which identified the absence of depression screening in WLHIV as a prominent challenge to health delivery. Moreover, the issue is far more upsetting for the patients when different health providers have a different approach to the extent that some of these health providers choose to assess their patients with un-established emotional questions. In Ethiopia, screening of depression should be part of the comprehensive care (20), and an is recommended the use of tested and validated mental health screening tools (21). Furthermore, the World Health Organization suggests that depression screening and management should be one of the elements in HIV care (22). Nevertheless, this service is conditioned with the attendance of a skilled practitioner and the readiness of validated tools.

The lack of a validated depression screening tool has caused a number of some HIV patients not to receive medical treatment for depression (23). This is confirmed by a study on developing countries that documented such challenges. The study has reported that lack of screening tools and guidelines in these health facilities of the study settings in Uganda, Ethiopia, India, and Nepal was a major source for HIV clients to miss this diagnosis and treatment services (24).

Even though the importance of depression screening and management of HIV patients in health facilities has been long recognized, the need to develop the validated Somali version of HADS is thought to be crucial. HADS is a self-assessment tool that measures anxiety and depression and is mostly used in hospital settings. It is recorded to perform well in screening the severity of symptomatic depression and anxiety disorder in somatic and psychiatric patients and the general population. Even though, evidence show the screening gap and the necessity to develop a validated screening tool for WLHIV in Ethiopia (25). Yet, HADS has not been validated in the Somali language. This study is intended to assess the reliability and validity of HADS among WLHIV in two hospitals in Jijiga town in eastern Ethiopia.

Methods

Study participants

The study participants were WLHIV who attend the ART service of two hospitals in Jijiga town of eastern Ethiopia. Participants who were in consent age of 18 years and above, confirmed HIV patients and on ART medication were included in this study. Seriously ill patients, patients recently diagnosed (less than 3 months) and patients with a history of psychiatric illness were excluded.

Questionnaire

Translation

The questionnaire was translated by the “forward-backward” procedure from English to the Somali language. A team of medical practitioners including a psychiatrist and the principal investigator translated. To review the wording, clarifications, and cultural contexts other professional panel encompassed of consolors, linguistic academics, and psychiatrists have approved the final version.

Hospital Anxiety and Depression (HADS)

HADS is a tool developed by Zigmond and Snaith to be practiced for the general population. Unlike other depression screening tools, this questionnaire is easy to deal separately with any comorbidity or impairment secondary to another disease (26). The instrument was validated in different languages and under participants with various medical conditions (27–30).

This assessment tool has seven items for anxiety and seven items for depression. As recommended, both anxiety and depression separately were scored. For the scales of anxiety and depression; scores that are less than 7 shows that the participants are not depressed, for the score 8–10 are mild cases and 11–14 is reported as moderate and 15–21 scores show severe cases. This questionnaire is validated and published in deferent languages.

Data collection procedure

The screening questionnaire was administered by a trained female nurse assigned to the ART clinic after offering informed consent. The screening assessment took an average of 15 minutes. Once finalized, the principal investigator was instantly checking its completeness. A higher score demonstrated, a higher score of anxiety and depression. Nurses provided reassurance, based on the screening results, there was no immediate concern about their emotional status. The data collection was conducted in a private and quiet room next to the ART for convenience and patient confidentiality.

Data analysis

SPSS version 22.0 was used for the statistical analysis of the validation study. The socio-demographic and clinical characteristics of women participants were presented descriptively in frequencies and percentages. For the reliability test, Cronbach alpha was used to show internal consistency. A Cronbach alpha greater than 0.60 was considered to be good (31). A correlation matrix of all the 14 items was computed and Kaiser-Meyer-Olkin and Bartlett’s test was used to measure the sample adequacy.

Moreover, a principal component analysis was conducted by using a Varimax rotation, and by Cattell's test, the eigenvalue was calculated in each of the extracted factors.

Results

Study participant's characteristics

The socio-demographic characteristics of the study participants of this study are shown in (Table 1). In this study, 357 women participated and completed the questionnaire. The mean (\pm SD) age of the study participants was 34.2 (\pm 8.8).

Table 1
Socio-demographic characteristics among WLHIV in ART treatment, 2019 (n = 357).

| Variable | Categories | Frequency | Percent (%) |
|----------------------------|-------------------------|-----------|-------------|
| Age | 18–24 | 54 | 15.1 |
| | 25–40 | 206 | 57.7 |
| | > 40 | 97 | 27.2 |
| Marital Status | Married | 134 | 37.5 |
| | Single | 100 | 28.0 |
| | Widowed | 77 | 21.6 |
| | Divorced | 46 | 12.9 |
| No of living children | Nulliparous/No children | 173 | 48.5 |
| | 1–3 | 142 | 39.8 |
| | 4–6 | 42 | 11.8 |
| Highest level of Education | No formal education | 166 | 46.5 |
| | Formal education | 191 | 53.5 |
| Ethnic origin | Amhara | 130 | 36.4 |
| | Somali | 113 | 31.7 |
| | Oromo | 65 | 18.2 |
| | Southern Nations | 31 | 8.7 |
| | Others | 18 | 5 |
| Faith background | Islam | 165 | 46.2 |
| | Christian | 192 | 53.8 |
| Employment status | Un employed | 129 | 36.1 |
| | Student | 89 | 24.9 |
| | Self employed | 55 | 15.4 |
| | Government employee | 84 | 23.5 |
| Income in ETB | < 1400 | 173 | 48.5 |
| | 1000–3800 | 80 | 22.4 |
| | > 3800 | 104 | 29.1 |
| Clinical staging | Stage I | 127 | 35.6 |

| Variable | Categories | Frequency | Percent (%) |
|----------------|------------|-----------|-------------|
| | Stage II | 81 | 22.7 |
| | Stage III | 93 | 26.1 |
| | Stage IV | 56 | 15.7 |
| CD4 cell count | < 250 | 95 | 26.6 |
| | 251–475 | 111 | 31.1 |
| | > 475 | 151 | 42.3 |
| OI comorbidity | No | 182 | 51.0 |
| | Yes | 175 | 49.0 |

Most (37.5%) of these interviewed women were married and almost half (48.5%) of these participants reported that they had no living children. Around 46.2% had no formal education, and 36.1% were not employed. The participant's viral load measurements indicated that (42.3%) had a CD4 count of ≥ 475 cell/l and (31.1%) of the women's CD4 count ranged from 251 to 475 cell/l. According to their symptomatic clinical staging, (35.6%) of the women were in WHO clinical stage I, while (26.1%) were at clinical stage III.

Reliability and internal consistency of HADS

To examine the internal consistency of anxiety and depression sub-scales in this instrument, Cronbach alpha was executed. In the analysis, a Cronbach alpha of 0.83 was found in the anxiety sub-scale and 0.84 in the depression sub-scale. Based on the item scales, none of the items was eliminated and all the corresponding items have shown their relevance. In the anxiety sub-scale, the question in which the interviewed women provided the highest number was read as "I feel tense or "wound up", whereas the least answered question tended to be "I get a sort of frightened" as shown in (Table 2). In addition to, in the depression sub-scale, the two questions mostly answered by the participants have answered was "I still enjoy the things" and "I can still laugh and see the funny side", while the least answered question was tended to be "I feel as I am slowed down". Accordingly, the aforementioned psychometric analysis has shown good internal consistency and none of the items were dropped from the analysis.

Table 2
Principal component analysis of factor loading on Anxiety and Depression sub-scales

| Item Number | HADS Item | Component | |
|--|---|-----------|----------|
| | | Factor 1 | Factor 2 |
| Anxiety | | | |
| A1 | I feel tense or 'wound up' | 0.57* | 0.35* |
| A2 | I get a sort of frightened feeling as if something awful is about to happen | 0.56* | 0.50* |
| A3 | Worrying thoughts go through in my mind | 0.66* | 0.33* |
| A4 | I can sit at ease and feel relaxed | 0.71* | 0.02 |
| A5 | I get a sort of frightened feeling like "butterflies" in the stomach. | 0.72* | -0.19 |
| A6 | I feel restless as I have to move | 0.72* | -0.21 |
| A7 | I get sudden feelings of panic | 0.71* | -0.15 |
| Depression | | | |
| D1 | I still enjoy the things I used to enjoy | 0.66* | 0.13 |
| D2 | I can laugh and see the funny sides of things | 0.67* | 0.17 |
| D3 | I feel cheerful | 0.67* | 0.25 |
| D4 | I feel as I am slowed down | 0.65* | 0.01 |
| D5 | I have lost interest in my appearance | 0.71* | -0.25 |
| D6 | I look forward with enjoyment to things | 0.68* | -0.41 |
| D7 | I can enjoy a good book, radio or TV. | 0.68* | -0.37 |
| *Indicates item loading of greater than or equal to 0.30 | | | |

Table 3
Factor analysis of rotated component matrix on Anxiety and Depression sub-scales

| Sub-scales | N ^o of the item | Item | Component | |
|------------|----------------------------|---|-----------|----------|
| | | | Factor 1 | Factor 2 |
| Anxiety | 1 | I feel tense or 'wound up' | 0.19 | 0.64 |
| | 9 | I get a sort of frightened feeling as if something awful is about to happen | 0.09 | 0.75 |
| | 5 | Worrying thoughts go through in my mind | 0.27 | 0.69 |
| | 7 | I can sit at ease and feel relaxed | 0.52 | 0.48 |
| | 3 | I get a sort of frightened feeling like "butterflies" in the stomach. | 0.67 | 0.33 |
| | 11 | I feel restless as I have to move | 0.68 | 0.32 |
| | 13 | I get sudden feelings of panic | 0.63 | 0.36 |
| Depression | 2 | I still enjoy the things I used to enjoy | 0.41 | 0.53 |
| | 4 | I can laugh and see the funny sides of things | 0.39 | 0.57 |
| | 6 | I feel cheerful | 0.33 | 0.63 |
| | 8 | I feel as I am slowed down | 0.48 | 0.44 |
| | 10 | I have lost interest in my appearance | 0.69 | 0.28 |
| | 12 | I look forward with enjoyment to things | 0.78 | 0.15 |
| | 14 | I can enjoy a good book, radio or TV. | 0.75 | 0.17 |

Construct validity of HADS

When the correlation matrix was computed in this analysis, all the 14-items of both sub-scales were correlated at a p-value level of 0.01. This signified the use of factor analysis and the inclusion of all these items. Based on the Kaiser-Meyer-Olkin and Bartlett's test, the measure of sample adequacy was found to be 0.93 and which is greater than the standard adequacy of 0.60. This was substantially significant in Bartlett's test of sphericity at a p-value of less than 0.001 with subsequent generated factors of eigenvalue greater than or equal to 1 as shown in the Scree Plot (Fig. 1). In this analysis, all the communalities have shown a score greater than 0.45 except the item "I feel as I am slowed down" which was rated as 0.42.

To analyse the validity of the HADS, Exploratory Factor Analysis (EFA) was used and factor loadings of greater than 0.30 were considered to be significant (32). Two components were extracted in this principle

analysis and the eigenvalue was calculated in each of these extracted factors. The first factor explained at a variance of 44.9% and the second factor was explained at 7.59%.

In factor 1, all the items of the anxiety and depression sub-scales were significantly loaded. Thus, after extracting the factors in a rotation converged at 3 iterations, the Varimax rotation with Kaiser normalization has shown that this coefficient may determine the absolute value.

As shown (Fig. 1).

From the output of the Varimax rotation of these components, both anxiety and depression were successfully loaded in the first factor. Thus, factors were reflected to be valid as the initial eigenvalue met the Kaiser criterion and was greater than 1, passed the Cattell's test of the scree plot (elbow criterion).

Discussion

The purpose of this study was to examine the reliability and validity of HADS and report its psychometric properties. It is expected that the introduction of this version of the screening instrument will assist the health care providers to assess, detect, and intervene in HIV patients in the ART service. The study was substantially a bi-dimensional and it has shown a two-factor structure for anxiety and depression sub-scales, which have been similarly examined in several HADS validation studies (33, 34) supporting the original solution by Zigmond and Snaith (35). In this study, HADS was evaluated on a sample of WLHIV who had a follow-up for ART treatment in two hospitals. The instrument is found to have a high internal consistency with Cronbach's alpha of 0.83 for anxiety sub-scale and 0.84 for depression as they are separately measured. This version showed higher possessions of good consistency, as self-administered instruments should present Cronbach alpha greater than or equal to 0.60 to be called reliable (31). However, it showed a slightly higher when compared with a study conducted on HIV patients (21). Despite the later study have highlighted that their internal consistency was satisfactory, yet the study sample and population was different. Furthermore, the possibility of the patients under study who manifest various symptoms of illnesses with underlying medical issues and the presence of the disease severity could matter. Regardless of the symptom similarities and their relevant clinical associates between anxiety and depression, different validation studies document different directions of correlation between anxiety and depression. In line with, this study has also reported a significant correlation between the two-sub-scales; depression and anxiety which supports Burn's model of testing (36) on the correlation of these two comorbid mental disorders. This finding is similarly consistent with the report of other validation studies on HADS (21, 34, 37). Conceptually, when examining the emotional status of patients, the two subscales are scored separately, yet in practice, the overlap between these scales is inevitable. The determination of the two common mental disorders; anxiety and depression in this instrument will probable present an added credit, unlike other screening tools which predominantly assess only the depression in HIV patients (38–40). A recent study on WLHIV in Kenya using PHQ-9 has suggested a further studies which would take in to consideration the anxiety-related mood of the WLHIV (40).

In the present study, our findings have documented that the components of both items of anxiety and depression sub-scales to be valid. Correspondingly, studies with different contexts have also concluded the validity of HADS in their respective versions. Regarding the psychometric properties of HADS, the validity constructs have shown similarity with other languages like the Amharic language in Ethiopia (21).

There were some observed limitations in our study; it emphasized women participants only, and might not completely be regarded to be representative of general populations. Thus, future studies should explore both genders. Also, this study has not established the relevant association between HADS and other screening modalities as a gold standard criterion. Finally, this study recruited participants from a single service entry point; the ART and the possibility to miss patients admitted or referred to other sections were considerable.

Conclusion

The findings of this study present that the HADS has acceptable psychometric properties in terms of both reliability and validity constructs. The tool is found to be a sound for the practical assessment and screening of anxiety and depression of chronic patients in general and WLHIV receiving ART treatments in particular. Hence, this HADS is applicable and recommended for use in the ART treatment centres of hospital set up.

Abbreviations

| | |
|------------|---------------------------------------|
| ART | Antiretroviral Therapy |
| CD4 | Cluster of Differentiation-4 |
| HADS | Hospital Anxiety and Depression Scale |
| HIV | Human Immunodeficiency Virus |
| OI | Opportunistic Infections |
| PHQ-9 | Patient Health Questionnaire- 9 item |
| PLHIV | People Living with HIV |
| PSS | Perceived Social Support |
| WLHIV | Women Living with HIV |

Declarations

Ethics approval and consent to participate

All the study procedures were according the ethical standard of the institution's human ethical procedure. The ethical approval of this study was obtained from the International Islamic University of Malaysia

Research Ethics Committee (IREC) (Reference: IIUM/305/14/11/2/IREC/2018-042. Dated: 04/01/2019). A permission letter was also gained from the Jijiga University board of review. The women participants in this study were provided a written document approved by IREC and informed consent then confirmed by their signatures for the use and dissemination of the study findings.

Consent for publication

Not applicable

Availability of data and materials

The data used for this validation study is available and can be provided upon request by the corresponding author.

Competing interests

The authors declare that they have no competing interests

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Authors contribution

AY and SR: conception and design, data collection, statistical analysis, interpretation of data and drafting the manuscript. RM and ML: critical revision of the manuscript. All authors have contributed and approved this manuscript.

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Figures

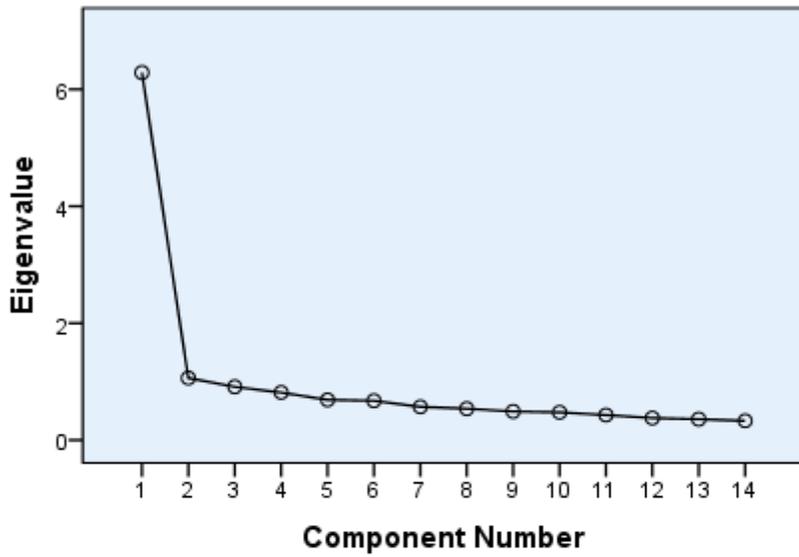


Figure 1

The scree plot of the anxiety and depression items

Supplementary Files

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