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The 12-item General Health Questionnaire (GHQ-12): translation and validation study of the Iranian version

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Abstract

Background: The objective of this study was to translate and to test the reliability and validity of the 12-item General Health Questionnaire (GHQ-12) in Iran.

Methods: Using a standard 'forward-backward' translation procedure, the English language version of the questionnaire was translated into Persian (Iranian language). Then a sample of young people aged 18 to 25 years old completed the questionnaire. In addition, a short questionnaire containing demographic questions and a single measure of global quality of life was administered. To test reliability the internal consistency was assessed by Cronbach's alpha coefficient. Validity was performed using convergent validity. Finally, the factor structure of the questionnaire was extracted by performing principal component analysis using oblique factor solution.

Results: In all 748 young people entered into the study. The mean age of respondents was 21.1 (SD = 2.1) years. Employing the recommended method of scoring (ranging from 0 to 12), the mean GHQ score was 3.7 (SD = 3.5). Reliability analysis showed satisfactory result (Cronbach's alpha coefficient = 0.87). Convergent validity indicated a significant negative correlation between the GHQ-12 and global quality of life scores as expected ($r = -0.56$, $P < 0.0001$). The principal component analysis with oblique rotation solution showed that the GHQ-12 was a measure of psychological morbidity with two-factor structure that jointly accounted for 51% of the variance.

Conclusion: The study findings showed that the Iranian version of the GHQ-12 has a good structural characteristic and is a reliable and valid instrument that can be used for measuring psychological well being in Iran.

Background

The General Health Questionnaire (GHQ) is a measure of current mental health and since its development by Goldberg in the 1970s it has been extensively used in different settings and different cultures [1–5]. The questionnaire was originally developed as a 60-item instrument but at present a range of shortened versions of the questionnaire including the GHQ-30, the GHQ-28, the GHQ-20, and the GHQ-12 is available. The scale asks whether the respondent has experienced a particular symptom or behavior recently. Each item is rated on a four-point scale (less than usual, no more than usual, rather more than usual, or much more than usual); and for example when using the GHQ-12 it gives a total score of 36 or 12 based

on the selected scoring methods. The most common scoring methods are bi-modal (0-0-1-1) and Likert scoring styles (0-1-2-3). Since the GHQ-12 is a brief, simple, easy to complete, and its application in research settings as a screening tool is well documented; it was decided to translate the GHQ-12 into Persian (the Iranian language) and to examine the psychometric properties of the questionnaire in a sample of young Iranian adolescents. This was to develop the Iranian version of the GHQ-12 to meet the increasing demand for the questionnaire. There is evidence that the GHQ-12 is a consistent and reliable instrument when used in general population samples [6].

Methods

The standard "forward-backward" procedure was applied to translate the questionnaire from English into Persian. Two independent health professionals translated the items and two others translated the response categories and a provisional version was provided. Subsequently it was back translated into English and following a careful cultural adaptation the final version was provided. Finally after pilot testing, the translated questionnaire was administered to a sample of healthy young people aged 18 to 25 years old. The sample was recruited through a national family journal and from two higher education institutes. The participants who were recruited through the journal returned the completed questionnaire by post and those who were recruited from two higher education institutes were tested in several groups while the assessors were present. In addition each respondent was asked to complete a short questionnaire containing demographic questions and to rate a measure of global quality of life; a subscale derived from the validated Iranian version of the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30)[7]. Global quality of life subscale contains 2 items and each item is rated on a seven-point scale. A linear transformation was performed to standardize the row scores. Scores range from 0 to 100 and the higher value indicates a higher level of global quality of life [8].

To test the reliability, the internal consistency of the questionnaire was assessed by Cronbach's alpha coefficient and alpha equal to or greater than 0.70 was considered satisfactory [9]. Validity was performed using convergent validity to demonstrate the extent to which the GHQ-12 correlates with global quality of life. It was expected that the GHQ-12 would correlate negatively with global quality of life. This was assessed by the Pearson product moment statistic (Pearson's correlation coefficient = r) and r equal to 0.40 or above was considered satisfactory. Furthermore the factor structure of the questionnaire was extracted by performing principal component analysis using oblique factor solution. The study used Goldberg's original scoring method. In this method response categories score 0, 0, 1, and 1 respectively. This gives scores ranging from 0 to 12 [10].

Results

Descriptive findings

In all 748 young people aged 18 to 25 years entered into the study. The descriptive findings are presented in Table 1. The mean age of respondents was 21.1 (SD = 2.1) years and most were female (76%), single (84%) and college/university students (50%). Employing the bi-modal method of scoring (ranging from 0 to 12) the mean GHQ score was found to be 3.7 (SD = 3.5). Forty-four percent scored above the mean GHQ score for the whole population of the respondents. The mean global quality of life score was 65.1 (SD = 21.5).

Table 1: The characteristics of respondents and descriptive findings (n = 748)

		No.	%
Age (group)			
	18–19	209	28
	20–22	335	45
	23–25	204	27
	Mean (SD)	21.1 (2.1)	
Gender			
	Female	567	76
	Male	181	24
Educational level (n = 730)			
	Primary/ Secondary	310	41
	College/ University	420	56
Marital status			
	Single	632	84
	Married	105	14
	Widowed	11	2
Employment status (n = 556)			
	Employed	114	22
	Student	280	50
	Housewife	69	12
	Unemployed	93	16
GHQ score			
	Mean (SD)	3.7 (3.5)	
	Range	0–12	
Global quality of life (n = 743)			
	Mean (SD)	65.1 (21.5)	
	Range	0–100	

Reliability

To test the reliability the internal consistency of the questionnaire was measured using Cronbach's alpha coefficient. The alpha for the whole sample was found to be 0.87 and was the same for both males and females indicating satisfactory results.

Validity

Validity of the instrument was performed using convergent validity. When the correlation between the GHQ-12 and global quality of life scores was investigated, as expected a significant negative correlation emerged ($r = -0.56$, $P < 0.0001$) indicating that those who were more distressed showed lower levels of global quality of life.

Factor structure

The principal component analysis with oblique rotation solution was performed and a two-factor structure was loaded that jointly accounted for 51% of the variance. The results are shown in Table 2. Apart from item seven (enjoy normal activities), other items loaded in two distinct factors producing the factors of 'psychological distress' and 'social dysfunction'.

Table 2: Factor structure of the GHQ-12 using principal component analysis with oblique rotation solution

	Factor 1	Factor 2
GHQ-12 Items		
1. Able to concentrate	0.57	-
2. Lost much sleep	-	0.69
3. Playing useful part	0.81	-
4. Capable of making decisions	0.56	-
5. Under stress	-	0.68
6. Could not overcome difficulties	-	0.62
7. Enjoy normal activities	0.57	0.46
8. Face up to problems	0.64	-
9. Feeling unhappy and depressed	-	0.64
10. Losing confidence	0.62	-
11. Thinking of self as worthless	0.79	-
12. Feeling reasonably happy	-	0.56

Discussion

The GHQ is a well-known instrument for measuring minor psychological distress and has been translated into a variety of languages [11–16]. However, it is not a tool for indicating a specific diagnosis. This study reports data from a validation study of the 12-item GHQ in Iran. In general, the findings showed promising results and were comparable with most research findings throughout the world. Our two-factor solution was similar to those reported in the WHO study of psychological disorders in general health care [17]. Reliability was assessed by internal consistency of the questionnaire reporting Cronbach's alpha coefficient and validity was examined by convergent validity performing correlation between the GHQ-12 and global quality of life scores and both showed satisfactory results.

It is argued that although the GHQ-12 was originally developed as a unitary screening measure for psychological problems, there have also been efforts to identify whether it has a multidimensional structure [18]. The World Health Organization study of psychological disorders in general health care in 15 different centers indicated that for the GHQ-12 substantial factor variation between centers exist. However, the study reported that after rotation two factors expressing depression and social dysfunction could be identified [17]. The findings from present study showed that the Iranian GHQ-12 is a valid measure of psychological distress and the factor structure of the questionnaire was very similar to that of the original language. Interestingly a recent findings from a Japanese study reported that the GHQ-12 could be used as an internally reliable and homogenous scale that produces mainly the factors of psychological distress and social dysfunction [16].

We used the bi-modal fashion of scoring and the results indicated that this method in Iran appears to be useful. Evidence suggests that there is no tendency for the GHQ to work less efficiently in developing countries [19]. The mean GHQ-12 score in this study was 3.7 (SD = 3.5). It is recommended that the mean GHQ score for the whole population of respondents provides a rough guide to the best cut-off threshold [20]. Thus considering people who scored above the mean, the findings from the present study indicated that 44% of the respondents showed an indication of mental health problems [21]. This clearly suggests that if investigators wish to use a screening instrument as a case detector, the shorter GHQ is remarkably robust and works as well as the longer instrument [19]. Similar studies among young adolescents reported that the GHQ-12 is a particularly useful measure with adolescents where there are likely to be a number of different threats to their psychological health, such as poor self-esteem, that may not necessarily constitute a formal psychiatric condition [22]. In contrast, studies have shown that the GHQ-12 is not a suitable instrument for some special populations such as elderly patients [23].

Iran has a very young population. In general, the findings from this study indicated that mental health in young people in Iran is poor and it is strongly associated with their quality of life. Since mental health in young adolescents could be regarded as a risk factor for psychological disorders such as antisocial behavior, criminal activity, suicidal behavior, substance abuse, depression, and eating disorders [24], improving quality of life in this age group becomes very important task. However, in interpreting the study findings it should be noted that the young people in the sample were a selected sample and thus it cannot be generalized to the whole population of young adolescents in Iran.

Conclusion

The findings suggest that the Iranian version of the 12-item GHQ is a reliable and valid instrument to measure minor psychological distress in young people and has a good factor structure.

List of abbreviations

GHQ: General Health Questionnaire; SD = standard deviation; WHO: World Health Organization.

Competing interest

None declared.

Authors' contribution

AM was the main investigator, analyzed the data, and wrote the paper. AMH, MSh GhG, ME, and AF all contributed to the study design, the translation procedure, data collection and first draft of the paper in Persian.

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