

## VALIDATION, FACTOR STRUCTURE, AND RELIABILITY OF THE FARSI VERSION OF GENERAL HEALTH QUESTIONNAIRE-28 ON IRANI STUDENTS #

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*The purpose of this study was to determine the validity, reliability, and factor structure of the General Health Questionnaire (GHQ-28) on Irani students. 116 students were randomly selected and 3 questionnaires were administered to them: GHQ-28, Student Life Problems Questionnaire (SLPQ), and Academic Problems Checklist (APC). Factor analysis was conducted on GHQ-28 and SLPQ to determine the underlying dimensionalities for the two scales. The principal component analysis of GHQ-28 responses with oblique rotation showed a 3-factor solution. These factors were labeled as: Severe depression, life satisfaction, and somatization-insomnia as compared to Goldberg's original 4 factors: somatization, anxiety-insomnia, social dysfunction, and severe depression. On the other hand, the principal component analysis of SLPQ responses revealed a 7-factor structure. These factors were labeled as: Lack of self-confidence, financial concerns, concern about family relations, neurasthenia, concern about marriage and future, phobic reactions, and forgetfulness. The Chronbach's alpha and the concurrent validity coefficients between the three scales were also found satisfactory. The results of analysis of regression of the factors of SLPQ on GHQ-28 scores showed that except for phobic reactions all the other 6 factors significantly explain 73 percent of variance of the scores.*

The General Health Questionnaire-28 (GHQ-28, Goldberg, 1972) has been widely used as a screening and diagnostic device because it is relatively short and easy to use. It has been translated into many different languages and its validity, reliability, and factor structure has been widely studied in different languages and also in cross-cultural research. For example Krol, Sanderman, Moum, and Suurmeijer (1994) have examined the factor structure of GHQ-28 in four European countries and have found the same original factors (somatization, anxiety-insomnia, social dysfunction, and severe depression) as suggested by Goldberg and Hillier (1979). Similarly,

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Pariante, Challita, Mesbah, and Guelfi (1992) in France, Siegert and Chung (1995) in New Zealand; Bhogle (1994) in India, and Iwata and Saito (1992) and Shek (1993) in Japan obtained more or less same factor structures on GHQ-28.

The validity and reliability of all versions of GHQ has also been confirmed in different cultures. For example, Banks (1983) has found 100 per cent sensitivity (sensitivity means percentage of patients who score below a threshold value) for the threshold score of 5/6 on GHQ-28 and Goldberg and Bridge (1987) have found 87 per cent sensitivity for this scale in english-speaking samples. Lobo, Perez-Echeverria, and Artal (1986) have studied Spanish medical out-patients and have found 82 per cent sensitivity for this scale. Medina-Mora, Padilla, and Campillo-Serrano (1983) have found 73 per cent sensitivity for GHQ-28 in Mexican patients.

There are numerous other validation studies in other cultures in which sensitivity of GHQ questionnaires against a cut-off point or threshold score has been determined. The percentage of misclassification have also been reported in these studies. However, the correlation of GHQ scores with other criteria has less often been determined in these validation studies. For example, Shigemi and Toshihide (2000) have reported significant relationships between GHQ factor scores and scores on some of the 14 items concerning perceived job stress in Japanese workers. They have also reported the alpha reliability coefficients of GHQ to be above .90 as do other studies in other cultures (e. g., Nilchaikovit, Sukying, & Silpakit, 1996).

GHQ-28 has also been translated into Farsi language (Dadsetan, 1998) but its psychometric qualities have not yet been determined on Irani culture. Therefore, the present study was carried out to determine the validity, reliability, and factor structure of GHQ-28 in Irani student population. The criteria for validation were the total scores obtained by administering the Student Life Problems Questionnaire (SLPQ) and Academic Problems Checklist (APC) to a sample of 116 Irani students studying in non-medical fields. Since it was assumed that students of medicine would be familiar with what the different items of GHQ-28 entails and there might be increased chances of socially desirable responses, therefore, medical students were not included in the sample. The criteria also included the seven factors obtained by factor analyzing the students' responses to SLPQ items. It was hypothesized that GHQ-28 total scores are significantly correlated to SLPQ total scores, scores on the seven SLPQ factors, and scores on the APC scale.

## METHOD

To achieve the objectives of the study, the research work was carried out in two phases.

### Phase I: Development of SLPQ and APC

#### Sample

The sample for the development of Student Life Problems Questionnaire (SLPQ) and Academic Problem Checklist (APC) included 15 randomly selected students. Among them 7 were boys and 8 were girl students, with age ranging between 19 to 25 years with a mean age of 25.5 years.

#### Procedure

As a preliminary step, students were asked to write down, in Farsi, two groups of problems they face on campus: General life problems and academic problems. In this way, 97 descriptors were obtained on general life problems and 50 statements were collected for study or academic problems. The former set of items was used to develop Student Life Problems Questionnaire (SLPQ), anchored on a five-point rating scale with the following response levels: always, frequently, some times, occasionally, and never. While the later set of items was used to develop Academic Problem Checklist (APC) with a yes/no response format.

### Phase II: Main Study

#### Sample

Fifty-nine boy and fifty-seven girl students from various semesters and majoring in various non-medical areas of concentration were randomly selected as the participants for this study. All participants agreed to take part in the study and were told that they would be subsequently informed of their percentile ranks on the questionnaires of the study.

#### Instruments

*General Health Questionnaire – 28 (GHQ–28)*

Translated version of GHQ–28 in Farsi language (Dadsetan,

1998) was used. GHQ-28 consists of four subscales labeled as: Somatic symptoms, anxiety-insomnia, social dysfunction, and severe depression. Each subscale includes 7 items. Each item has 4 levels of response options and is scored 0 to 3 from right to left (in English it is scored from left to right).

### *Students Life Problem Questionnaire (SLPQ) & Academic Problem Checklist (APC)*

General life problems faced by the students were measured through SLPQ, while academic problems were assessed through APC, both developed in the phase I of the present study.

### *Demographic Questionnaire*

A demographic questionnaire was also administered to the subjects, which assessed the students' grade point average, gender, number of past semesters, family size, father's job and income, father's and mother's education.

## **RESULTS**

### *Factorial Validity of GHQ and SLPQ*

All the responses to GHQ items were subjected to principal component analysis with oblique rotation. Loadings equal to or more than .30 were considered significant. Although the results showed approximately the same original four factors (somatization, anxiety-insomnia, social dysfunction, and severe depression) as suggested by Goldberg and Hillier (1979) and explained 56.19 per cent of the variance, yet inspection of the table of factors revealed that a 3-factor solution would better fit the results, explaining 50.67 per cent of the variance. These factors could be named as social dysfunction, depression, and anxiety-insomnia. A principal component analysis with varimax rotation yielded similar results. The results of principal component analysis of GHQ items by oblique rotation with three and four components are presented in Tables 1 and 2.

Table 1

*The Factor Structure of GHQ-28 with Three Components and Oblique Rotation*

Items	<i>Components</i>		
	1	2	3
C19	.789		
C17	.763		
C15	.745		
C20	.720		
C18	.678		
C13	.614		
C21	.576	-.344	
C22	.514	-.392	
C26	.458	-.327	
C28		-.831	
C24		-.819	
C27		-.807	
C25		-.798	
C23		-.664	
C12		-.356	.316
C16			
C3			.814
C6			.731
C7			.681
C4			.678
C2			.672
C5			.642
C10			.604
C1			.497
C11	.326		.447
C8			.422
C9			.407
C14	.381		.390

Table 2

*The Factor Structure of GHQ-28 with Four Components by Oblique Rotation*

Items	Components			
	1	2	3	4
C28	.882			
C24	.881			
C27	.855			
C25	.830			
C23	.727			
C22	.455	.422		.302
C12	.407			
C17		.774		
C19		.750		
C15		.742		
C18		.687		
C20		.659		
C13		.552		
C21	.384	.534		
C26	.378	.413		
C14	.332	.348		
C10		.319	.708	
C3			.653	.330
C2			.613	
C1			.611	
C4			.607	
C11		.354	.569	
C9			.381	
C5				.713
C6			.338	.629
C16				.530
C7			.394	.530
C8				.365

Two analyses were performed on the SLPQ items with oblique rotation. Factor loadings below .30 were considered insignificant. The results of the first analysis showed that a 7-factor solution would best fit the data, which explained 46.6 per cent of variance. Fifteen items out of 97 did not load on any factors. Therefore, these items were removed and a second analysis with oblique rotation and a 7-factor solution was performed on the remaining 82 items.

The obtained factors were labeled as: Lack of self-confidence, financial concerns, concern about family relations, neurasthenia, concern about marriage and future, phobic reactions, and forgetfulness.

### *Reliability Analyses*

The reliability coefficients (internal consistency as shown by Chronbach's alpha) for GHQ-28, SLPQ, and APC scales were found to be: .91, .95, and .91 respectively.

### *Correlational Analyses*

The concurrent validity coefficients between GHQ-28, SLPQ, APC, and the seven SLPQ factors are presented in Table 3.

Table 3

*The Validity Coefficients between GHQ-28, SLPQ, APC, and SLPQ Factors*

Significant	<i>r</i>	<i>p</i>
SLPQ	-.717*	.000
APC	-.576*	.000
F1	-.442*	.000
F2	.036*	.702
F3	.260*	.005
F4	.638*	.000
F5	.360*	.000
F6	.032*	.730
F7	-.572*	.000

As can be seen, except for factor 2 (financial concerns) and factor 6 (phobic reactions), SLPQ total scores, APC total scores, and scores on lack of self-confidence, family relations, marriage and future, and forgetfulness factors are significantly correlated to GHQ-28 total scores. These correlations are relatively high and support the hypotheses of this research.

The results of regression of the 7 SLPQ factors on GHQ-28 total scores in which all the factors are simultaneously taken into account are presented in Table 4.

Table 4

*Analysis of Regression of Seven Student Life Problem Factors on GHQ Total Scores*

Model	Unstandardized Coefficients		Standardized Coefficients	<i>t</i>	<i>p</i>
	Beta	Std. Error	Beta		
(Constant)	59.439	.616	0.00	96.561	.000
Self-confidence	-3.367	.648	-.270	-5.193	.000
Financial	1.754	.630	.141	2.784	.006
Family	1.320	.640	.106	2.062	.042
Neurasthenia	5.845	.651	.470	8.985	.000
Future	1.759	.652	.141	2.699	.008
Phobia	-.321	.622	-.026	-.516	.607
Forgetfulness	-5.044	.644	-.405	-7.830	.000

Analysis of covariance of these factors with GHQ-28 total scores yielded identical results as presented in Table 5.



Table 5

*Analysis of Covariance of Student Life Problems with GHQ-28 Total Scores*

Source	Type III Sum of Squares	df	M S	f	p	Eta Squared	Noncent. Parameter	Observed Power
Corrected Model	13073.611(b)	7	1867.659	42.491	.000	.734	297.436	1.000
Intercept	409831.667	1	409831.667	9324.035	.000	.989	9324.035	1.000
Confidence	1185.249	1	1185.249	26.965	.000	.200	26.965	.999
Financial	340.789	1	340.789	7.753	.006	.067	7.753	.788
Family	186.892	1	186.892	4.252	.042	.038	4.252	.533
Neurasthenia	3548.491	1	3548.491	80.731	.000	.428	80.731	1.000
Future	320.218	1	320.218	7.285	.008	.063	7.285	.763
Phobia	11.698	1	11.698	.266	.607	.002	.266	.080
Forgetfulness	2694.565	1	2694.565	61.304	.000	.362	61.304	1.000
Error	4747.067	108	43.954					
Total	427652.345	116						
Corrected Total	17820.678	115						

R-squared = .734 (Adjusted R-squared = .716)

As can be seen from Table 5, these seven factors explain 71 per cent of GHQ total score variance and only the covariance of phobia with GHQ is not significant. Moreover, it can be seen that neurasthenia, forgetfulness, and lack of self confidence explain 42, 36, and 20 per cent of GHQ total score variance respectively.

## DISCUSSION

The high internal consistency and concurrent validity coefficients of GHQ-28 with student life problems in this study shows that GHQ-28 is both a valid and a reliable instrument and can be used as a screening and diagnostic device in Irani population. It is relatively short and can also be used in student counselling centers and in research.

The results of principal component analysis of GHQ-28 items has generally yielded more or less the same factors as originally shown by Goldberg and Hillier (1979) although some studies report similar but not the same factors (e.g., Bhogle & Prakash, 1994; Chan, 1985, Siegert & Chung, 1995). On the basis of cross-cultural research it can be concluded that the General Health Questionnaires (GHQ-28, GHQ-30, and GHQ-60) are highly valid and reliable and their factor structure is highly stable across cultures. This is true whether varimax or oblique rotation is used in the analysis. Varimax rotation yields a larger factor and some smaller factors whereas oblique rotation yields factors with more or less equal number of items. Moreover factors obtained from varimax rotation are independent, that is, they are not correlated while the factors obtained from oblique rotation are slightly correlated.

Multivariate and regression analyses of the seven student life problems on the GHQ-28 scores in this study yielded identical results. The results of multivariate analysis additionally showed that neurasthenia accounts for 43 per cent, forgetfulness accounts for 36 per cent, and lack of self-confidence accounts for 20 per cent of total variance in GHQ scores. The other factors although significantly related to GHQ scores but their contribution to student general health is less. Phobia does not seem to be related to general health.

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