The Validation of General Health Questionnaire-28 Tamil Version

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Abstract

The aim of the study was to translate and evaluate the validity and reliability of self- administered Tamil translated version of the General Health Questionnaire-28 in a school setting. The questionnaire was completed by 40 school students and 10 subject experts. Findings confirmed the face, content and construct validity of the Oxford Happiness Questionnaire. Therefore, it can be recommended for use of measuring mental health status among south Indian adolescents.

Keywords: *General Health Questionnaire-28, Translation, Validity, Reliability, Mental health.*

I. INTRODUCTION

The General Health Questionnaire-28 was developed by Goldberg in 1979 and is a standardized measure for diagnosing the minor psychiatric disorder of an individual. It is a self-report questionnaire for measuring psychological well-being. The questionnaire was designed to identify whether an individual's current mental state differs from his/her typical state. The GHQ-28 identifies two main concerns:

- The inability to carry out normal functions;
- The appearance of new and distressing phenomena

There is a high correlation found between the anxiety subscale and the overall score. The subscales are not independent of each other and the subscales should not indicate specific psychological diagnoses (McDermott, 2015). The GHQ-28 is suitable for all age groups from adolescents.

The questionnaire consists of 28 statements with four subscales such as somatic symptoms, anxiety/insomnia, social dysfunction and depression. Different methods of scoring have been evaluated in detail. Based on the traditional method the scoring can be as 0, 0, 1, 1 whereas, in the chronic method, the scoring is 0, 1(positive item) or 0(negative item, 1, 1 and in the Likert scoring method it is 0, 1, 2, 3 for the responses better than usual, same as usual, worse than usual and much worse than usual. The total possible score will be around 0-84 and higher scores represent a higher likelihood of psychological distress. This GHQ-28 takes 5-10 minutes to complete. (McDermott, 2015)

Based on previous research and numerous studies, it is revealed that the test-retest reliability of the GHQ-28 was found to be 0.78

to 0.9 and higher internal consistency was found (Sterling, 2011).

Apart from the fact that GHQ-28 has been utilised extensively, translation of study instruments is conducted periodically without consideration for crucial constraints and treated as an afterthought in the study protocol. The availability and adoption of these surveys must be expanded, hence translation and validation into additional languages are required. The GHQ-28 translation is significant because it takes into consideration the sociopsychological, cultural, and microeconomic issues facing Indian society. The GHQ-28 should be transcribed into the regional dialect and then contextually assessed. (Radhika et al., 2020)

The aim of the study is to translate and assess the General Health Questionnaire-28's self-administered Tamil translation's validity and reliability in a school setting. The study's specific goals are

A) to translate the questionnaire into Tamil and investigate the scale's face and content validity.

B) Researching the scale's dependability, test-retest agreement, and confirmatory analysis

II. METHOD:

a) Study setting and participants:

The study was conducted in school from Karur district, Tamil Nadu. The population consists of 40 school students from grade IX and XII. All participants were fluent in Tamil and age ranges from 14-17 years. Most of the participants belong to rural community and from backward socio-economic background. Respondents were invited to read and complete the questionnaire booklet which consists of informed consent form, a demographic profile sheet and along with the Tamil version of GHQ-28.

b) Measures:

The General Health Questionnaire-28 consists of 28-tems with varied four alternatives such as better than usual, same as usual, worse than usual and much worse than usual; not at all, no more than usual, rather more than usual and much more than usual; more so than usual, same as usual, rather less than usual and much less than usual. Each item is scored from 0-1-2-3 based on Likert scale and the total score ranges from 0-84. Higher the scores lower the mental health and lower the score means higher the mental health state.

c) Translation process:

Forward translation:

In this step, two translators T1 and T2 are assigned for translation process. one translator from Psychology background T1 who is aware of the questionnaire and its purpose and translator two T2 from non-psychology background who isn’t aware of the questionnaire. Both the translators are asked to translate questionnaire from original English language into native Tamil language. The translation of questionnaire from original language to regional language is called as forward translation.

Synthesis:

The translated questionnaires T1 and T2 are synthesized into common translation T12. A written report has been documented to address the issues and discrepancies are resolved.

Back translation:

The common translation T12, after resolving the issues has been translated again to original language by other two independent translators.

The two translators are not aware of the original questionnaire and asked to translate to English language which is called back translation. Two back translations B1 and B2 was done to verify whether the synthesized Tamil translation was made to measure the purpose.

After the back translation the English translated questionnaire was verified by the researcher to know whether it contains the same meaning as the original (GHQ-28) questionnaire.

Expert committee Review:

The expert committee consists of methodologies, language professionals and translators to produce the pre-final version of the questionnaire. The role of the experts is to consolidate all the version of the questionnaire T1, T2, B1 and B2 and develop the pre-final version. The written report has been produced to explain the rationale of each decision.

Fig 1. An example of instruction and rating scale for Expert Invitation

Dear Expert,

I am conducting research on "Mental Health in Relation to Psychological Factors among Tribal and Non-tribal Students". As part of the research, I am translating the English version of the instruments to Tamil. With this e-invitation, I am formally soliciting your expert opinion on the current version of the original English and the translated Tamil version of the following psychometric Scale.

As a psychology expert, your expert opinion about the equivalence between these two versions in terms of (A) Comparability of language (how comparable is the formal wording?) and (B) Similarity of interpretation (would the paired items be interpreted similarly, even if the wording is different?). Please circle the number that best reflects the extent to which the translation equivalence is. Comments areas are provided.

Each of the items was placed on a 7-point Likert scale of:

1 = Extremely comparable/similar;

2 = Comparable /similar;

3 = Moderately comparable/similar;

4 = Slightly comparable/similar;

5 = Neutral/similar;

6 = Not at all comparable/similar;

7 = Slightly not comparable /similar for participants' responses.

The translators were asked to translate psychometric scales into Tamil with consideration of the cultural issue and the meanings of the terms used in South Indian culture. Namely, conceptual rather than literal meaning is the goal of translation in this study. Please evaluate the translation equivalence with the goal of translation in this study in mind. Following is an example about how to rate the translation equivalence. Please use the contents in the standard column as criteria to evaluate whether the comparison content is equivalent to the standard. For example, content A is the standard. If you feel that content B needs a minor revision to be equivalent to content

A, you circle the number "3" and describe suggestions for revising content B.

Standard	Comparison	Evaluation of Equivalence
Original English Version	**Translated Tamil Version**	**Evaluation of Equivalence**
A	**B**	1 2 3 4 5 6 7 Comments:

Pretesting:

The pre-final version of the questionnaire in target language was pre-tested to examine the layout, wording, ease of understanding and ease of completion of the questionnaire. The concluded version, the final version of the Tamil questionnaire is achieved in this stage.

Fig 2. Sample Questionnaire

Original version	**Forward translation**	**Back translation**	**Final version**
been feeling perfectly well and in good health?	*உடல் நிலை சரியாகவும் அல்லது சரியில்லாமலும் உள்ளது போல் இப்படி நினைத்ததுண்டா*	Been feeling good and healthy	*மிகவும் நன்றாக மற்றும் ஆரோக்கியமாக உணர்கிறீர்களா***?**
been feeling in need of a good tonic?	*நல்ல பலவிருத்தி வேண்டும் என்பதுபோல் உணர்கிறீர்களா***?**	Feeling like you need a good boost?	*ஒரு நல்ல ஊக்கம் தேவைப்படுவதாக உணர்கிறீர்களா***?**
been feeling run down and out of sorts?	*அனைத்தையும் இழந்துவிட்டது போல் உணர்கிறீர்களா***?**	Feeling low on energy?	*ஆற்றல் குறைந்துவிட்டதாக உணர்கிறீர்களா***?**
felt that you are ill?	*உடல் மற்றும் மனநிலை சரியில்லாதது போல் உணர்கிறீர்களா***?**	Do you feel sick?	*நீங்கள் நோய்வாய்ப்பட்டிருப்பதாய் உணர்கிறீர்களா***?**
been getting any pains in your head?	*தலையில் வலி இருப்பது போல் உணர்கிறீர்களா***?**	Feeling any pain in head?	*ஏதாவது தலையில் வலி உணர்கிறீர்களா***?**

d) Pilot testing:

The researcher has given the questionnaire to a sample of 40 students between the ages of 14-17 as a means of pilot study. The obtained data was analysed for reliability and validity by Cronbach's Alpha and correlation techniques. The results revealed that the Tamil version of the scales were reliable and valid for the study population. In this step, 40 school students were asked to elaborate on what they thought each questionnaire item and their corresponding response meant. All the students participated in the present study revealed

favourable response towards the translations. The students have told that the Tamil version is easy to understand and respond, and they don't find any difficulty in words, sentence and the phrases. This ensures that the translated items retained the same meaning as the original items, and to ensure there is no confusion regarding the translated questionnaire.

e) Reliability:

Test-retest reliability and stability:

To measure the reliability Tamil version of the questionnaires were administered twice among 40 participants. To evaluate whether the scale remains stable over time, assessment of test-retest reliability was considered. The first administration was done as soon as they enter the school while the second was done before they left the school. The minimum time between the two administration was four hours. The time interval was chosen to reduce the possibility of participants remembering their initial response, the so-called "carry-over" effect.

Face validation:

The face validity was carried out both using qualitative and quantitative methods. In qualitative, five participants were randomly selected and interviewed face-to-face about clarity, difficulty and appropriateness of GHQ-28 items. Then items were revised to make it simpler and clearer. Further, the quantitative assessment was carried out, calculating the impact score for each item. A five-point scale was used to rate item that ranged from Not Important (1) to Very important (5). Five randomly selected students rated the importance of mental health. Finally, impact score was calculated for each item using the formula "Impact score= Frequency (%) (number of participants rated the item 4 or 5) x importance (mean score item on the 1-5 scale)24.

Content validity:

Content validation of the instrument. Although the literature is controversial on the ideal number of experts, in this study, ten independent experts were requested to participate in the study. An expert committee from psychology background as evidenced by the number of publications in the field were agreed to participate. Experts were asked whether the questionnaire items are adequately measuring the construct intended to assess and whether the items are sufficient to measure the domain of interest. They were given a week to respond to our request, and those indicated their interest to participate in the study were therefore furnished through email with informed consent form along with a cover letter explaining the purpose of the study, the Tamil version of the questionnaire and the evaluation criteria. The relevance of each question was judged based on a 4-point scale as propounded by Davis". The experts scored each question as follows: 1=not relevant, 2=somewhat relevant, 3=quite relevant and 4-highly relevant. For those questions, that they would have scored low (1 or 2), the experts had to provide recommendations (for revisions or deletion) for each questionnaire. A maximum of two weeks period was given to validate the questionnaire and return through email.

Face and Content validation:

The translated questionnaire (Tamil version) was subjected to both face and content validation. Face validity was carried out with seven students while the content was carried out to ten independent psychology experts with reference to the comparability of language and similarity of the interpretation. All the participants stated that the questionnaire was

simpler, clear and related to the objectives with the impact score above 1.5. Twenty-seven (27) items were judged valid for both similarity and comparability. Content validation of an overall validity index of over 0.99, with a universal agreement index (S-CVI/UA) of 0.97 (27/28) and 1.00 (28/28) for comparability and similarity, respectively. This implies that 97% of items were judged valid for comparability, while 100% for similarity. None of the items were withdrawn for reaching the threshold (Data not shown).

f) Statistical analyses:

Data were analysed using SPSS 21.0 for Windows version (Statistical package for social sciences, IBM Inc. USA www.spss.com). Inter-rater reliability and the test-retest reliability of the total Tamil versions of the questionnaire were assessed using intra-class, and inter-item correlation coefficient. According to the rule of George and Mallery (2003) the output ranges >.9 (Excellent), >.8 (Good), >.7 (Acceptable), >.6 (Questionable), >.5 (Poor), and <.5 (unacceptable). The closer the coefficient is to 1.0, the greater is the internal consistency of the items (variables) in the scale. The Cronbach's alpha value was also determined to assess the reliability while Bland- through principal component factor analysis (varimax rotation) and Cronbach's alpha. Psychometric properties of the GHQ-28 were assessed Confirmatory factor analyses were applied to confirm the construct validity. Results were considered statistically significant at the 5% level of significant ($p<0.05$).

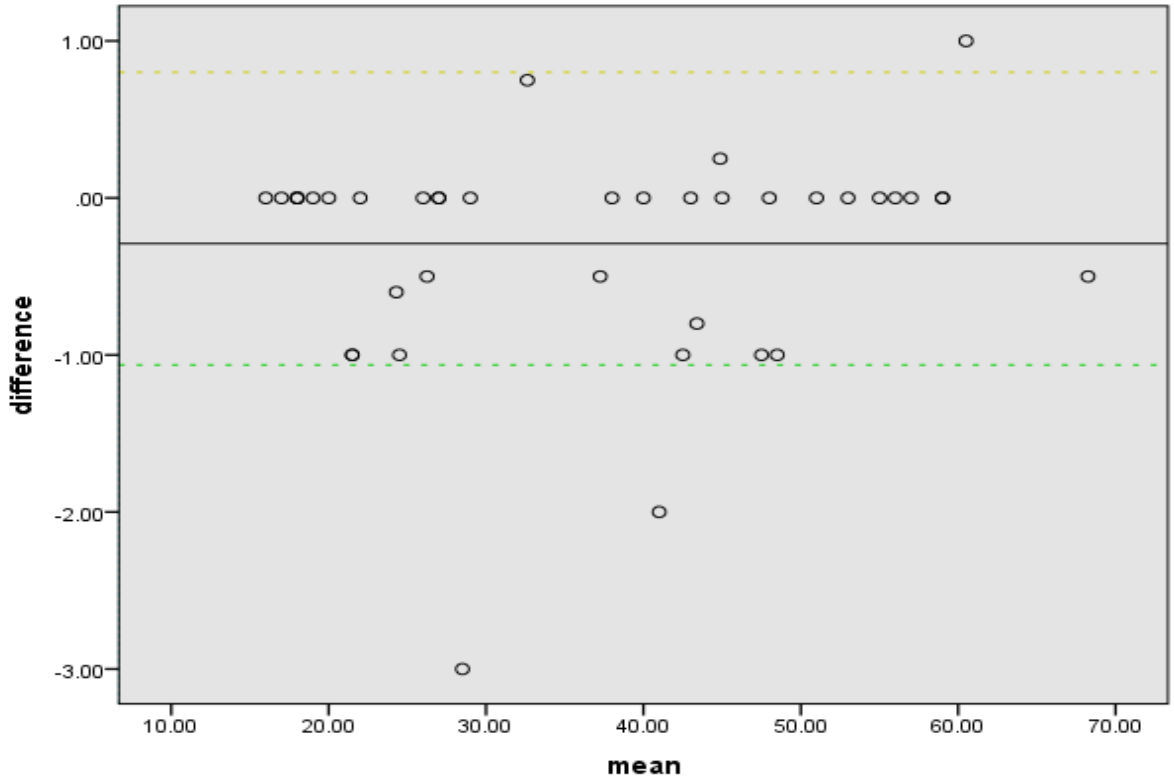
The collected data were checked for missing values. The percentage of missing values for all items on all the tests were under 5% and random in nature. The missing values were replaced with the series mean, as all scored were approximately normally distributed.

III. RESULTS AND DISCUSSION:

Table 3.1: The reliability of Tamil translated GHQ-28 questionnaire.

Dimensions	Mean	SD	Cronbach's Alpha	No. of Items
Somatic symptoms	8.70	3.94	.799	7
Insomnia	8.77	4.30	.767	7
Social dysfunction	11.02	5.26	.848	7
Depression	8.07	4.88	.819	7
GHQ-28	36.70	15.07	.919	28

Fig. 3 Test-retest reliability



Overall reliability in a sample of forty participants was .919 (Table 3.1). To further examine test-retest reliability, forty participants were randomly selected. Fig. 3 shows the level of agreement between Time and Time 2 using a Bland-Altman plot. In the mean scores, no significant difference was found in the mean score (t = 2.708, df = 39, p=0.010) between Time 1 (M= 2.97, SD = 0.94 range = 2.10-2.40) and Time 2 (M= 3.01, SD = -1.090, range = 2.10- 2.83). Levels of internal consistency reliability (Cronbach, 1951) using Cronbach's alpha in a sample of participants at both testing periods were acceptable for a twenty-nine-item measure (Time 1: alpha = .92; Time 2: alpha = .91).

Table 3.2: The assessment of item inter-correlation characteristic and reliability.

Factors and items	Mean	SD	Total-item correlation
Been feeling perfectly well and in good health?	1.75	.707	.534
Been feeling in need of a good tonic?	1.52	.750	.472
Been feeling run down and out of sorts?	1.45	.714	.456
Felt that you are ill?	1.22	.891	.587

Been getting any pains in your head?	.92	1.04	.648
Been getting a feeling of tightness or pressure in your head?	.90	.900	.535
Been having hot or cold spells?	.92	.797	.485
Lost much sleep over worry?	1.35	1.00	.636
Had difficulty in staying asleep once you are off?	1.27	.960	.491
Felt constantly under strain?	1.42	.984	.380
Been getting edgy and bad-tempered?	1.30	.992	.485
Been getting scared or panicky for no good reason?	1.35	.921	.595
Found everything getting on top of you?	1.02	.973	.575
Been feeling nervous and strung-up all the time?	1.05	.814	.548
Been managing to keep yourself busy and occupied?	1.90	.928	.537
Been taking longer over the things you do?	1.72	1.06	431
Felt on the whole you were doing things well?	1.65	1.00	.464
Been satisfied with the way you've carried out your task?	1.67	1.16	.701
Felt that you are playing a useful part in things?	1.52	1.01	.646
Felt capable of making decisions about things?	1.22	1.12	.599
Been able to enjoy your normal day-to-day activities?	1.32	.971	.680
Been thinking of yourself as a worthless person?	1.50	1.08	.575
Felt that life is entirely hopeless?	1.40	1.08	.670
Felt that life isn't worth living?	1.15	.975	.813
Thought of the possibility that you might make away with yourself?	1.12	1.01	.630
Found at times you couldn't do anything because your nerveswere too bad?	1.12	.991	.390
Found yourself wishing you were dead and away from it all?	.95	.985	.517
Found that the idea of taking your own life kept coming into your mind?	.82	.902	.592

The inter-correlation was identified to measure the validity of the translated version of GHQ-28. The obtained p-values are significant at 0.05 and 0.01 level for 28 items in the questionnaire. It shows that the items were interrelated with one another and no items were excluded. Thus 28 items are reliable and valid in Tamil version.

Table 3.3: The Exploratory factor analysis for General Health Questionnaire-28

Kaiser-Myer-Olkin Measure of sampling Adequacy		.647
Bartlett's Test of Sphericity	Approx. Chi-square	785.569
	df	378
	Sig.	.000

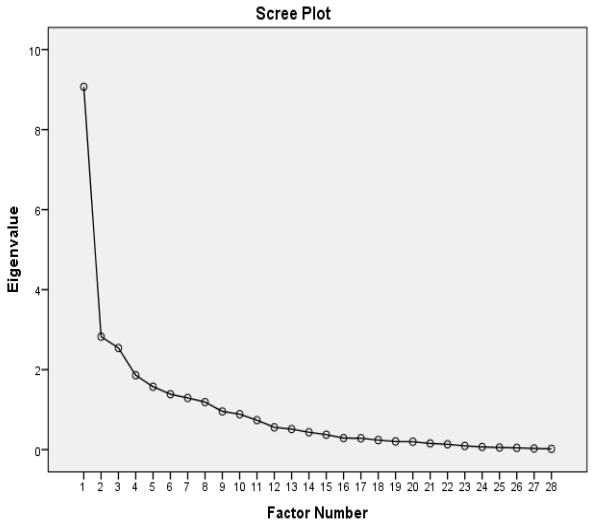
KMO and Bartlett's Test

Statements	**Factors**				**Cumulative %**
	1	**2**	**3**	**4**	
Been feeling perfectly well and in good health?	.790				**73.391**
Been feeling in need of a good tonic?	.741				
Been feeling run down and out of sorts?	.747				
Felt that you are ill?	.738				
Been getting any pains in your head?	.797				
Been getting a feeling of tightness or pressure in your head?	.855				
Been having hot or cold spells?	.716				
Lost much sleep over worry?		.918			**92.216**
Had difficulty in staying asleep once you are off?		.925			
Felt constantly under strain?		.769			
Been getting edgy and bad-tempered?		.868			
Been getting scared or panicky for no good reason?		.765			
Found everything getting on top of you?		.786			
Been feeling nervous and strung-up all the time?		.757			
Been managing to keep yourself busy and occupied?			.932		**98.441**
Been taking longer over the things you do?			.944		
Felt on the whole you were doing things well?			.909		
Been satisfied with the way you've carried out your task?			.928		
Felt that you are playing a useful part in things?			.887		
Felt capable of making decisions about things?			.792		

Been able to enjoy your normal day-to-day activities?			.652		
Been thinking of yourself as a worthless person?				.905	**100.000**
Felt that life is entirely hopeless?				.906	
Felt that life isn't worth living?				.902	
Thought of the possibility that you might make away with yourself?				.780	
Found at times you couldn't do anything because your nerveswere too bad?				.746	
Found yourself wishing you were dead and away from it all?				.826	
Found that the idea of taking your own life kept coming into your mind?				.834	

Exploratory Factor Analysis

Fig. 3: screen plot shows the eigenvalues of extracted components in PCA for the General Health Questionnaire – 28



Exploratory factor analyses

EFA using principal component factor analysis with varimax rotation was used to determine the underlying factor structure of GHQ-28 without any assumptions and constraints. To measure sampling adequacy, the Kaiser-Meyer-Olkin (KMO) test espoused by Kaiser (1974) was performed KMO resulted in .647, Bartlett's test of sphericity (X (406) =785.569, p<.001) indicated that the correlation between items were sufficient to perform EFA. Factor analysis revealed a six factor-solution, ranged from .652 to .944, explaining 100.00% of the variance. These factors include a somatic symptoms, insomnia, social dysfunctions and depression.

The Tamil version of the General Health Questionnaire-28 is east to apply, and reliable for the population and can be used to screen the mental health status of the adolescents.

IV. CONCLUSION:

The present study provides satisfactory evidence for both the face and content validity as acceptable and understandable and related to South Indian culture. The internal consistency reliability and the test-retest reliability of the General Health Questionnaire-28 among a sample of southern Indian school students. Although most of the studies did show internal consistency and validity of the questionnaire and to our knowledge, had carried out with

reference to face and content validity. The present study showed the translated Tamil version of the questionnaire is valid and reliable for the region.

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