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Cross-cultural adaptation, translation and Moroccan validation of General Health Questionnaire (GHQ12)

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Abstract

The 12- item General Health Questionnaire (GHQ-12) is a widely recognized and effective instrument for assessing the psychological distress of individuals. Multiple studies have been done on the reliability and psychometric properties of the GHQ-12 as a measure of psychological distress covering diverse segments of populations across different countries. The aim of this study was to translate into Moroccan dialect and validate the GHQ12 scale among the parents of children with cancer at the Children Hospital of Rabat. The cross-sectional survey was conducted among parents or guardians of children with cancer followed at the Pediatric Hematology and Oncology Center of the Children Hospital of Rabat. The screening was conducted using a self-administered, validated Moroccan version of GHQ-12 questionnaire. Using Principal Component Analysis (PCA) to extract the factors., the Arabic Moroccan version of GHQ-12 was found to have a three factor structures namely "social dysfunction", "anxiety/depression" and "loss of confidence" which accounted for 57,6% of the item variance. The overall Cronbach's alpha coefficient of the scale was found to be high (0.83) with each factor having acceptable inter-item consistency ranging from 0.61 to 0.74. The Moroccan Arabic version of the GHQ12 scale has proven to be reliable and valid for assessing psychological distress in parents or guardians of children with cancer in a Moroccan context. This would enable healthcare professionals to identify parents who may need help coping with their child's cancer and to quickly allocate appropriate resources.

Keywords: General Health Questionnaire-12, Pediatric cancer, Psychological distress, Reliability, Validity.

Full length article *Corresponding Author, e-mail: asmaa.marrakchi@gmail.com

1. Introduction

1.1 Background

Pediatric cancer is a source of psychological distress for parents, which can have a negative impact on their child's support during the treatment process [1]. Traditionally, health professionals have been able to successfully assess an individual's state of well-being by measuring addiction, anxiety, distress, and depression [2]. Mental health is therefore not simply the absence of self-reported negative problems, but is defined as a state of complete physical, mental, and social well-being [3]. The availability of subjectively completed measures for the quantitative assessment of psychological distress has become an integral part of practice and research in healthcare settings [4], but one of the most widely used self-reported questionnaires is the General Health Questionnaire (GHQ) formulated by Goldberg in the 1970 and recognized as a reliable measure of mental health [5]. The GHQ is the most commonly used self-report instrument. This questionnaire is used in many countries and in many studies of health professionals [6-8]. It was developed in England as a screening instrument to identify psychological distress in primary care settings

[5,9,10]. It measures two aspects of a psychiatric episode: the inability to carry on normal daily activities and the appearance of new symptoms leading to a state of psychological distress. Its initial version consisted of 60 items in English, with several shorter versions: 30, 20, 28 and 12 items. Of the various versions listed, the GHQ-12 is the most popular and is widely preferred [11] because of its simplicity of use, its reliability in generating robust results and its conciseness, comprising only 12 items instead of the 30 presents in other versions, while maintaining similar effectiveness in detecting non-psychotic psychiatric disorders.

The combination of the questionnaire's high level of accuracy and the small number of items makes the GHQ12 a suitable questionnaire for measuring psychological distress both in clinical practice and in epidemiological and psychological research [12]. The GHQ12 has been shown to be as reliable as the long version in detecting people with psychological distress and has been translated into many different languages. Research into the psychometric qualities of these translated versions has suggested that they are valid and reliable for use in a one-dimensional model [13,14]. However, numerous studies have shown that the GHQ-12 measures psychological distress in more than one dimension, the most common being in two [15,16] or three dimensions [17,18]. The three-factor model proposed by Graetz [19] has received the most empirical support in this context and has subsequently been replicated in confirmatory analyses [20,21]. This model includes the factors of social dysfunction, anxiety/depression and loss of confidence. In the absence of any documentation concerning the validation of the GHQ-12 in Morocco and its widespread application in different cultures as a screening tool in clinical [22] and non-clinical [23] settings, it was decided to translate the GHQ-12 from English into Moroccan dialect Arabic and to evaluate its psychometric properties with a sample of parents of children with cancer at the Pediatric Hematology and Oncology Center of Children Hospital of Rabat.

2. Methods

2.1. Participants

This cross-cultural validation study was conducted between January and June 2023 among parents or guardians of children with cancer admitted to the Pediatric Hematology and Oncology at the Center Children Hospital of Rabat, one of the main tertiary referral centers for the treatment of childhood cancers throughout the country and serving large areas of northern and central Morocco (Tangier-Tetouan-Al Hoceima and Rabat-Salé-Kenitra).

The study was conducted using a self-administered questionnaire consisting of two parts; Part A (socio-demographic and clinical data of participants and their children) and Part B (General Health Questionnaire 12; GHQ12). The recommendations of Streiner's guide were followed to estimate the sample size [24] and the number of participants included in the study during the data collection period was approximately 121.

2.2. Measures

This is a widely used instrument designed to screen for psychological distress. The scale asks whether the respondent has recently experienced a particular symptom or behavior. Each item is scored on a four-point scale (less than usual, not more than usual, rather more than usual or much more than usual) and gives a total score of 12 or 36 depending on the scoring method chosen. The most common scoring methods are bimodal scoring (0-0-1-1) and Likert scoring (0-1-2-3). Since the latter produces a more acceptable distribution of scores for parametric analysis (less skewed and less kurtosis), we used the Likert scoring style for this study. A higher score indicates a greater degree of psychological distress [5].

2.3. Translation and data collection

The standard "forward-backward" procedure was applied to translate the questionnaire (the GHQ-12) from English into Moroccan Arabic dialect. Two translators translated the original scale into dialectal Arabic. Two independent translators then translated the translated version back into English. The translators were not involved in the study, so comparability and equivalence of meaning were ensured. From the different versions, the authors created a draft Arabic version of the scale. An independent professional reviewed the draft version to ensure that the GHQ12 items were suitable for use by the Moroccan population. In general, minor differences were corrected at this stage by agreement between the different translations. The final scale was administered to a small group of 10 Moroccan parents to assess the extent to which the scale was clear and understandable. Participants were asked to indicate whether the items were readable and understandable. No changes were made to adapt the scale items to the concept of Moroccan culture. Subsequently, the final Moroccan Arabic dialect version of the GHQ12 scale was used.

2.4. Data analyses

Quantitative variables were expressed as mean ± standard deviation, and qualitative variables as frequency and percentage. All data were normally distributed before statistical testing. Test-retest reliability between the first and second administration of the scale was performed on 30 participants after one week and assessed by the Intra-class Correlation Coefficient (ICC). An ICC $\geq$0.70 is considered acceptable [25]. The internal consistency of the GHQ12 was studied using Cronbach's alpha coefficient. A Cronbach coefficient $\geq$0.70 is considered satisfactory [26]. To explore the factor structure of the Moroccan version of the GHQ-12, an Exploratory Factor Analysis (EFA) was first performed using principal component analysis (PCA) to extract the factors. The number of factors to be retained for the PCA was evaluated using a scree plot. Confirmatory factor analysis (CFA) was also used to test the model. Different model fit indices were taken into account: Root Mean Square Error of Approximation (RMSEA) where <0.08 is considered a good fit, Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) where $\geq$0.90 is considered a good fit [27]. Discriminant validity or the determining factors of GHQ12 were studied in univariate analysis by Generalized Linear Model (GLM). Variables with $p<0.20$ were included in a multivariate model. A value of $p<0.05$ was considered statistically significant. Statistical analysis was conducted using SPSS software and AMOS version 23.0.

2.5. Ethical approval

The study protocol was approved by the Ethics Committee for Biomedical Research of Mohammed V University, Rabat (01/23). Written informed consent was

obtained from all participants. All data received from individual participants were kept confidential.

3. Results

3.1. Sample characteristics

A total of 121 participants were recruited between January and June 2023. There was a clear predominance of women, representing 87.6% of the study sample. Participants ranged in age from 20 to 67. 90% were married and 46.3% of parents had more than three children. 35% of the parents had a basic level of education and 62% had access to the Health Insurance Coverage for the Economically Indigent (RAMED). The household income of participants did not exceed 2000 dhs for 43.8% of the population studied. Other socio-demographic and clinical characteristics are presented in (Table1).

3.2. The internal consistency of the GHQ-12 Cronbach

Coefficients was calculated to examine the reliability of these domains and the alphas obtained reflect moderate to high inter-item consistency for each dimension. The overall assessment of reliability showed reasonably high inter-item consistency, alpha = 0.83. Cronbach's coefficient values for each factor were 0.74 (Social Dysfunction), 0.7 (Anxiety/Depression) and 0.6 (Loss of Confidence). Test-retest reliability was calculated to confirm that the Arabic GHQ12 was constant over time. 30 participants were re-recruited after one week to complete the scale. The results showed that correlations between the test and retest were strong, with a total score of 0.80. Test-retest reliability ranged from 0.87 for 'social dysfunction', 0.80 for 'depression-anxiety' and 0.93 for 'loss of confidence'. These results suggest that the Moroccan Arabic version of GHQ12 scale has acceptable reliability over time.

3.3. Factorial analysis

To examine the structure of the GHQ-12 scale, a factor analysis using the extraction method of Principal Component Analysis (ACP) was carried out with varimax rotation of the axes. The data met the Kaiser-Meyer-Olkin criteria for sampling adequacy of 0.848. Bartlett's test of sphericity was acceptable ($\chi 2 = 430.91$, $p = 0.0001$). The results indicated that three factors had eigenvalues greater than one and that these accounted for 57.6% of the total variance of the items (Fig 1).

- The first factor, consisting of 6 GHQ12 items (1,3,4,7,8,12), corresponds to the "social dysfunction" dimension, accounting for **38.1%** of the variance.
- The second factor consisted of 4 GHQ12 items (2,5,6,9) corresponding to the "Anxiety/depression" dimension and representing **10.6%** of the variance.
- The last two GHQ12 items (10,11) corresponded to the "loss of confidence" dimension, making up the third factor and accounting for **8.91%** of the variance.
- Confirmatory analysis attested the adequate fit of the hypothetical three-factor model to our data, with a TLI = 0.97, RMSEA = 0.036, and CFI = 0.98 (Fig 2).

3.4. Discriminant validity

The determinants of GHQ12 were assessed using the socio-demographic and clinical characteristics of the participants. Less-educated parents obtained higher psychological distress scores than parents with a high level of education for the "social dysfunction" and "loss of confidence" dimensions. High scores of psychological distress were observed among parents of only children with cancer for the "social dysfunction" dimension, and these scores were also correlated with a personal history of cancer and a history of anxiety-type psychiatric illnesses. Anxiety/Depression was reported in parents with RAMED or AMO social security cover (Table 2).

4. Discussion

The results of our analysis show that the GHQ12 can provide reliable and valid answers even in a new socio-cultural environment such as Morocco. No missing or incomprehensible data were noted in our study. This underlines the acceptability and simplicity of the GHQ12. The results of the Moroccan Arabic version of the GHQ12 showed satisfactory results and were comparable to most research results worldwide. Regarding internal consistency, the results of the study showed consistency with other previous studies that the GHQ12 has high overall inter-item reliability (0.83) as a 3-dimensional measure. This result is supported by previous studies on the Malaysian (0.85), French (0.83), Spanish (0.78) and Saudi (0.86) populations [27-30]. It can therefore be concluded that the GHQ12 is a reliable internal measure of psychological well-being, valid for individuals from a variety of demographic backgrounds, and robust in different contexts. Exploratory factor analysis (EFA) extracted 3 GHQ12 factors in our study. Factor 1 was labelled as social dysfunction (6 items), factor 2 as anxiety (4 items) and factor 3 as loss of confidence (2 items). These three factors explained 57% of the overall variance. This result is in line with data from the literature, which has also confirmed the number of three factors when assessing the structural validity of the questionnaire [28,32,33]. Some of these research studies, for example, Normala [28] and Daradkheh [31] revealed that the GHQ12 was three-dimensional, nevertheless, they used names very different from those proposed by Gratez (1991) [19] who also showed results similar to ours as a three-factor structure (social dysfunction 37.0%, anxiety/depression 12.0% and loss of confidence 8.0%).

4.1 Determinants of psychological distress in parents or guardians of children with cancer

The discriminant validity of the GHQ12 was confirmed in our study. the RLM revealed that there was a statistically significant association between GHQ12 scores and the level of education of the parents of children with cancer. it was found that less educated parents were more likely to experience problems of social dysfunction and loss of confidence than parents with a higher level of education which contradicts the findings of Banks [34] and Elmettwaly [32]. This could be explained by difficulties in understanding their children's illness, which does not allow them to adhere easily to the care system.

Table 1: General characteristics of the study population

Characteristics		Frequency (percentage)
Sociodemographic Characteristics		
Age (Years) *		35,2 ± 8,4
Gender	Female	106(87,6)
	Male	15 (12,4)
Relationship with the child	Mother	98(81)
	Father	13(10,7)
	Guardian	10(8,3)
Professional activity	Regular	32(26,4)
	Irregular	89(73,6)
Area of Residence	Urbain	70(57,9)
	Rural	51 (42,1)
Education Level	Illiterate	35(28,9)
	Primary school	35(28,9)
	College school	26(21,5)
	Secondary school	3(2,5)
	University	22(18,2)
Clinical Characteristics		
Personal history of cancer	Yes	2(1,7)
	No	119 (98,3)
History of somatic illness	Yes	19(15,7)
	No	102(84,3)
History psychological illness	None	111(91,7)
	Anxious	1(0,8)
	Dépressive	4(3,3)
	Unknown	5(4,1)
Family history of Cancer	Yes	6(5)
	No	115(95)
Total GHQ12 score*		22,3 ± 6,61

* Mean ± Standard deviation

Table 2: Associations of demographic and clinical characteristics with GHQ-12 factors

Characteristics	Social dysfunction			Anxiety/Depression			Loss of confidence		
	β(S.E)	**IC95%**	**ρ *value***	**β(S.E)**	**IC95%**	**ρ *value***	**β(S.E)**	**IC95%**	**ρ *value***
Relationship with the child									
Father	-0,50	1,12;11,33	0,74				0,19	-1,63 ;2,03	0,83
Mother	-0,022	-3,57;2,55	0,95				0,67	-0,68 ;2,03	033
Guadian	0*						0*		
Number of child									
Only one	1,75	0,005;3,49	**0,04****						
2 Children	0,30	-1,08;1,68	0,67						
3 or more	0*								
Education level									
Illetrate	3,18	1,09;5,27	**0,003****				1,9	0,90 ;2,89	**<0,001****
Elementary	2,03	0,12;3,95	0,037				1,26	0,27 ;2,25	**0,013****
Secondary	0,81	-1,01;2,63	0,38				1,21	0,15 ;2,27	**0,024****
Undergraduate	0*						0*		
Social security									
RAMED	1,37	-1,63;4,38	0,36	2,85	1,15 ;4,55	**0,001****			
AMO	2,,48	-0,47;5,44	0,104	2,99	1,27,4,72	**0,001****			
Autres	0*			0*					
Personal history of Kc									
Yes	5,62	1,04;10,21	0,016						
No	0*								
History of Kc in the family									
Yes	1,02	-0,19;2,23	0,099	0,73	0,036 ;1,43	**0,039****	0,85	0,11 ;1,59	**0,024****
No	0*			0*			0*		
History of somatic illness									
Yes							1,57	0,53 ;2,61	**0,003****
No							0*		
History of psychological illness									
Aucun	-0,55	-3,46;2,35	0,70						
Dépressif	2,46	1,82 ;6,75	0,26						
Anxieux	8,72	1,30 ;16,14	**0,021****						
Autres	0*								
Announcement deadline									
0 - 15j							-0,10	-1,10 ;0,90	0,84
16 - 30j							-0,39	-1,52 ;0,74	0,49
31 - 60j							0,005	-1,25 ;1,26	0,99
61 - 90j							0*		
Child's age									
< 4	0,12	-1,93;2,19	0,98	0,36	-0,86 ;1,6	0,56	0,27	-0,99 ;1,54	0,67
4 – 7	-1,42	-3,64 ;0,79	0,2	-0,48	-1,8 ;0,83	0,47	-0,78	-2,1 ;0,53	0,24
8 – 11	-0,46	-2,70 ;1,77	0,68	1,09	-0,22 ;2,41	0,1	0,21	-1,17 ;1,6	0,75
12 et 15	0*								

0* : Indicates the reference category

**: Significate at p value <0.05

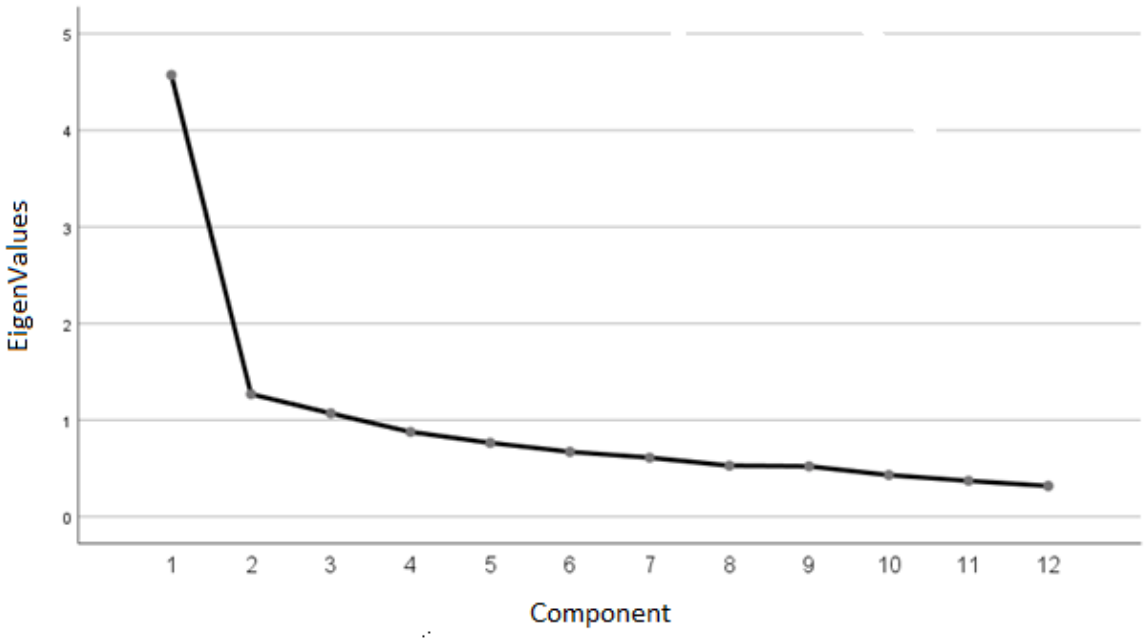

Figure 1: Scree plot of Exploratory Factor Analysis with Eigenvalues and Optimal factor selection (n = 121)

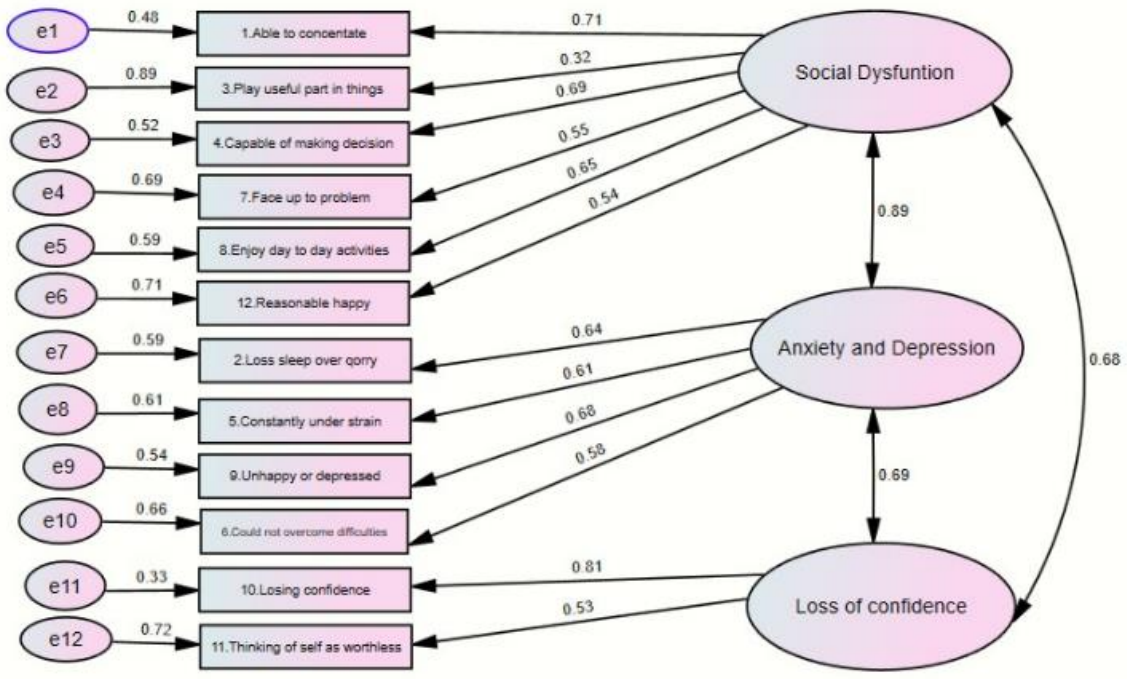

Figure 2: Confirmatory factor analysis path diagram showing the item loadings on the three subscales of the GHQ-12 model, with the best fit indices, CFI=0.98, TLI=0,97, RMSEA=0.0365

The results of Vivian WQ and Lou have shown that parents with a child with cancer are at risk of suffering from PD because of a financial situation deemed unsatisfactory [34]. In our study, the type of social security cover was significantly correlated with anxiety factors, but financial status was not significantly correlated with GHQ12 scores, which corroborates the results of Kazak [36] and Baskin CH [37]. Adequate medical coverage can reduce the financial stress associated with childhood cancer treatment, which may help reduce anxiety and distress. Our results also showed that parents with an only child with cancer were statistically associated with the scores obtained for social dysfunction but not for the other factors, which contradicts the results of the study by Kasak et al [36] which reported that a number of children greater than 3 was a factor of PD in parents, in fact, having many children means having more parental demands and duties which maximize parental stress.

4.2 Strengths and limitations

The main strength of this study was that the results obtained were in agreement with previous studies conducted on the clinical and non-clinical population, but the small sample size of participants in this study, which was conducted at a single site, potentially limited the generalizability of the results. Nevertheless, the number of participants was comparable to other studies found in the literature [31].

5. Implications and recommendations

The implementation of a reliable and valid instrument, such as the GHQ12, can potentially be implemented in the context of pediatric cancer as a quick and easy method of measuring parental distress. This may help to identify those who are more likely to develop psychological disorders in the future and therefore preventative measures could be considered. Future research studies (with a larger sample size) could be expanded to involve several pediatric cancer treatment sites in Morocco, will be useful to further evaluate the practical effectiveness of GHQ12 factors.

6. Conclusion

The Moroccan Arabic version of the GHQ12 scale has proven to be reliable and valid for assessing psychological distress in parents or guardians of children with cancer in a Moroccan context. This would enable healthcare professionals to identify parents who may need help coping with their child's cancer and to quickly allocate appropriate resources.

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Abbreviations

GHQ: General Health Questionnaire

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