Research article
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Psychometric properties of WHOQOL-BREF in clinical and healthy Greek populations: Incorporating new culture-relevant items

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The present study examines main psychometric properties of the World Health Organisation (WHO) quality of life (QoL) instrument, the WHOQOL-BREF with the inclusion of four national items. Participants were 425 adult native Greek speaking, grouped into patients with physical disorders, psychiatric disorders and healthy individuals. Participants were administered WHOQOL-BREF and 23 national items, the General Health Questionnaire (GHQ-28) and the Life Satisfaction Index (LSI). Confirmatory factor analysis produced acceptable fit values for the original model of 26 items within the four WHOQOL domains: physical health, psychological health, social relationships and environment. Testing for the fit of national items within this model, the results indicated four new items with the most satisfactory fit indices and were thus included forming a 30-items version. The national items refer to: (a) nutrition, (b) satisfaction with work (both loaded in the physical health domain), (c) home life and (d) social life (both loaded in the social relationships domain). Statistical tests were applied to the 26- and 30-items versions producing satisfactory results, with the 30-items version showing slightly better values. Furthermore, results on the 30-items version included: (a) internal consistency, which was found satisfactory, with alpha values ranging from α=0.67–0.81, while the inclusion of new items produced higher alpha values in physical health and social relationships domains, (b) construct validity with good item–domain correlations, as well as strong correlations between domain scores, (c) convergent validity, which was very satisfactory, showing good correlations with GHQ-28 and LSI, (d) discriminant validity, showing instrument's ability to detect QoL differences between healthy and unhealthy participants, and between physically

ill and psychiatric patients, and (e) test-retest reliability, with ICC scores in excess of 0.80 obtaining for all domains. The WHOQOL-BREF Greek version was found to perform well with sick and healthy participants, demonstrating satisfactory psychometric properties. Use of the instrument may be recommended for clinical and general populations, for service or intervention evaluation, as well as for cross-cultural clinical trials.

Key words: WHOQOL-BREF, validity, reliability, quality of life, physical illness, mental disorders.

Introduction

Measurements of quality of life (QoL) are increasingly used today as part of routine clinical care and reappraisal, across different groups of patients with physical or mental disorders and across different countries.[1–6] QoL measurement can provide health carers with valuable information regarding the needs of patients and the effects of interventions.

Besides patient-centred use, QoL measurements are systematically applied to monitor outcomes from clinical trials in multinational studies. So, QoL instruments are used for various aims and in different countries, but they need to be suitable, as they can be culture-specific or disease-specific restricting validity of cross-cultural comparisons across large patient groups.[7] Language and culturally validated measurements are thus needed to assess the impact of disorders and treatments across different settings and patient groups. Addressing these issues, the World Health Organisation (WHO) produced a generic QoL instrument, which can be tested in different languages and clinical or social settings, as to become suitable for systematic cross-cultural health-related Qol measurement.[8–9]

WHOQOL-BREF: A brief historical account

Introduced as an easily administered instrument for measuring therapeutic outcomes, the WHOQOL-BREF is an abbreviated 26-items version of WHOQOL-100, developed by the World Health Organization.[9–10] Items have been selected from 100-items form of WHOQOL on the basis of statistical criteria.[11–12]

WHOQOL-BREF consists of 24 items corresponding to 24 QoL (thematic) facets, and two items comprising an overall quality of life/general health facet. Items are organized into 4 domains: (1) physical health, (2) psychological health, (3) social relationships and (4) environment. The 4-domain model was produced after merging two of the original six WHOQOL-100 domains, i.e. Level of Independence and Spirituality domains and has been tested and found consistent with empirical results of WHOQOL-100 field studies.[10–11] More recently, an international field trial of the WHOQOL-Group in 23 countries indicated that WHOQOL-BREF has good to excellent psychometric properties and is identified as a cross-culturally valid instrument for assessing QoL.[12] WHOQOL is based on cross-cultural methodology supporting the inclusion of extra national items that can be generated by focus groups in each country or language, and can be added to the core items in order to acquire conceptual equivalence and accommodate the rich, semantic and cultural variations of QoL across different language versions.[13–14] WHOQOL-BREF has been tested as a health-related QoL measurement system, showing suitability in cross-linguistic and cross-cultural studies involving different patient groups.

Since its development, WHOQOL-BREF has been translated and validated into several languages, among which are: Argentina,[15] India,[16] Thailand,[17] Australia,[18] Turkey,[19] Denmark,[20] Korea,[21] Malaysia,[22] Poland,[23] Israel,[24] Taiwan,[25] China,[26] India,[27] Ireland,[28] Norway.[29]

The purpose of the current study was to examine psychometric properties of WHOQOL-BREF and determine the suitability of national items within the original model. For this purpose, following the guidelines of WHO, several focus groups were conducted with patients and health carers resulting in 23 new national items.[30–31]

Material and method

Patient respondents were recruited from primary care, rehabilitation and hospital settings. Healthy respondents came from administrative personnel in the public sector.

Following the WHO protocol for the development of WHOQOL instruments in new centers,[32] a sample of 425 individuals participated in the study, consisting of patients with physical illness (n=234), patients with mental disorders (n=124), and healthy individuals (n=67).

Physically ill individuals were under treatment for the last 5 years diagnosed with chronic, moderate or severe hypertension (n=139), or with different forms of cancer (n=95), (no cases in palliative care or undergoing chemotherapy within the last year). Patients were consecutive visits at relevant outpatient units in two public General Hospitals.

Psychiatric patients consisted of chronic schizophrenic outpatients (n=87), attending community mental health services, or were in-patients with alcohol abuse/dependence (n=37), consecutively admitted for a 5-week detoxification therapy.[33] All psychiatric participants were recruited from the University of Athens Department of Psychiatry, and were diagnosed according to DSM-IV criteria.[34]

Healthy participants were randomly selected from administrative employees of public services, reporting being free from disease at the time of the study.

All subjects participated on a voluntary basis and were provided with informed consent forms, being free to withdraw at any time and for any reason.

Instruments

In addition to administering WHOQOL-BREF and national items, participants completed the General Health Questionnaire (GHQ-28) and Life Satisfaction Index (LSI):

a. WHOQOL-BREF pilot version

The 26-items version is rated on a 5-point Likert scale, with higher scores indicating positive item assessment. All scores were transformed to a 0–100 scale, in accordance with the WHO guidelines.[35] The WHOQOL-100 items form including WHOQOL-BREF items underwent a rigorous translation, back translation and cross-examination by bilingual subjects.[30–31] Furthermore, investigation was performed on cultural and linguistic equivalence of WHOQOL measurement using focus groups methodology.[30–31] As a result, 23 national items were produced which were formulated to fit the WHOQOL-BREF questioning format and were administered in a separate section. Testing initially the WHOQOL-100, satisfactory psychometric properties were found in healthy and patient groups within the specific cultural context.[33,36]

b. Life Satisfaction Index (LSI)

LSI is a 13-items questionnaire, validated with greek samples.[37] It is a generic, self-report measure of satisfaction with various aspects of life: physical state, mental state, psychological health, occupation, financial status, relationships with the partner, sexual life, family life, role in the family, friends and acquaintances, hobbies, physical appearance, and general QoL.[38] A higher total score is indicative of greater life satisfaction.

c. General Health Questionnaire (GHQ-28)

It is a well known self-report measure of common psychiatric symptoms widely used to identify short term changes in mental health and is often used as a screening instrument for detecting mental disorders in clinical and non-clinical populations.[39] Psychometric properties of the 28-item Greek version are reported as satisfactory.[40] It consists of four sub-scales measuring: (a) somatic symptoms, (b) anxiety/insomnia, (c) social dysfunction, and (d) severe depression. The GHQ-28 employs a response scale ranging from 0 to 3, with higher values indicating the worst health status. Scores were reversed for consistency of reference with other measures of the present study, so higher scores indicate a more positive self-assessment of health.

Procedure

The above instruments were administered once. In addition, healthy participants were invited to complete the questionnaire within 3–4 weeks in order to perform test/re-test analysis.[32]

Statistical analysis

Data were analysed using SPSS for Windows, Version 13.0 (SPSS, Chicago, IL, USA). Analysis included: confirmatory factor analysis and testing for inter-

nal consistency, construct validity, convergent validity, discriminant validity and test-retest reliability.[41]

Results

Demographic characteristics

Sociodemographic characteristics of patient and healthy participants are displayed in table 1.

Structure of the instrument

Confirmatory factor analysis (CFA) at item level was performed using the 26 items values corresponding to 24 facets and 2 items referring to the global facet of QoL/health. The results strongly supported the structure of WHOQOL-BREF with all items loading onto four domains originally assigned to. Furthermore, 23 national items were introduced into the model and testing highlighted 4 items with the best fit in the model. These items refer to new thematic facets: (1) nutrition; (2) work satisfaction; (3) home-life; and (4) social life. The thematic content of these facets is described in the respective publication including the translation of the original domains and facets of the WHOQOL instrument.[42] The 4 new items loaded on two of the existing domains supporting the 4-domain structure table 2). Specifically, the two items referring to nutrition and work satisfaction loaded onto the WHOQOL-BREF physical health domain, whilst the other two items referring to home-life and social life loaded onto the WHOQOL-BREF social relationships domain. Additionally, the comparative fit index (CFI) on the four domain model was well above 0.9 (CFI=0,981). Based on these results, a 30-items version including 4 national items was produced (Appendix I). Next, the 30-items and the original 26-items versions underwent statistical analysis for internal consistency.

Internal consistency

Calculation of Cronbach's alpha coefficient per domain was performed, which resulted in satisfactory alpha values ranging from 0.67–0.81 for the 30-items version (table 3). Slightly less satisfactory results were produced for the 26-items version, particularly in relation to social relationships domain (table 4).

Construct validity

Pearson coefficient (r) was performed between item-domain scores in the total sample of participants (N=425). Results demonstrated good item-domain correlations and strong correlations between all total domains scores, particularly between physical health, psychological health and social relationships. Moderate correlations were identified between environment domain score and all other domains. In overall, the values confirm the construct validity of the instrument (table 5). (Low correlations range from 0.1–0.3; moderate from 0.3–0.5 and high >0.5).

Convergent validity

It was hypothesized that WHOQOL-BREF domain scores would be closely related to scores obtained from the sub-scales of the GHQ-28 and the total score of the LSI instrument. In particular, the WHOQOL-BREF physical and psychological health

Table 1. Demographic characteristics of the physically ill, the psychiatrically ill and the healthy participants (N=425).

	Physically ill N=234		*Psychiatrically ill N=124*		*Healthy N=67*	
	N (%)	*Mean (SD)*	*N (%)*	*Mean (SD)*	*N (%)*	*Mean (SD)*
Mean age (years)		60.71 (11.11)		40.79 (11.88)		32.75 (8.12)
Gender: Male	75 (32.1%)		83 (66.9%)		20 (29.9%)	
Female	159 (67.9%)		41 (33.1%)		47 (70,1%)	
Education (years)		9.15 (3.83)		11.25 (3.55)		14.97 (2.65)
Marital status:						
Single	17 (7,3%)		72 (58.1%)		30 (44.8%)	
Married/Cohabitating	168 (71,8%)		35 (28,2%)		34 (50.7%)	
Separated/Divorced/Widowed	49 (20,9%)		17 (13,7%)		3 (4.5%)	

Table 2. Confirmatory factor analysis (CFA) on WHOQOL-BREF 30-items version.

WHQOL-BREF Domains	*Number-Item**	*Factor loadings*
Overall QoL/general health	1	0.73
	2	0.53
Physical health (including the domain "level of independence")	3	0.36
	10	–0.73
	16	–0.48
	15	–0.69
	17	–0.83
	4	0.42
	18	–0.83
	N1**	–0.48
	N4**	–0.49
Mental health (including the domain "spirituality/religion/personal beliefs")	5	0.60
	7	0.58
	19	0.80
	11	0.45
	26	–0.61
	6	0.69
Social relationships	20	0.74
	22	0.60
	21	0.52
	*N2***	0.72
	*N3***	0.60
Environment	8	0.18
	23	0.63
	12	0.48
	24	0.51
	13	0.40
	14	0.33
	9	0.50
	25	0.60

*Item number as presented in the administration form, ***N*=National items (Appendix I)

Table 3. Internal consistency (Cronbach's alpha) of the 30-items version.

WHOQOL-BREF Domains	*alpha (α)*
Physical health	0.81
Mental health	0.79
Social relationships	0.76
Environment	0.67
Overall QoL/general health	0.89

Table 4. Internal Consistency (Cronbach's alpha) of the 26-items version.

WHOQOL-BREF Domains	*alpha (α)*
Physical health	0.80
Mental health	0.79
Social relationships	0.65
Environment	0.66
Overall QoL/general health	0.87

domains would correlate with all four GHQ-28 sub-scales, while social relationships domain would demonstrate strong correlation with the total LSI score due to similarity in their content. In accordance with our expectations, a considerable number of correlations in the total sample of 425 participants were found to be moderate to strong. In addition, strong correlations between the WHOQOL-BREF overall QoL/general health facet and the GHQ-28 sub-scales were identified (table 6).

Table 5. Correlations between WHOQOL-BREF domain scores (Pearson's r) in the total sample.

	Physical health	*Psychological health*	*Social relationships*	*Environment*	*Overall QoL/general health*
Physical health	1.00	0.73*	0.55*	0.36*	0.67**
Mental health	0.73*	1.00	0.65*	0.34	0.63**
Social relationships	0.55*	0.65*	1.00	0.37	0.60**
Environment	0.36*	0.34*	0.37*	1.00	0.35**
Overall QoL/health	0.67**	0.63**	0.60**	0.35**	1.00

*p<0.05, **p<0.01

Table 6. Pearson's Correlations between WHOQOL-BREF domains, GHQ-28 sub-scales, and LSI total score for the total sample (N=425).

WHOQOL-BREF Domains	*GHQ-28 Somatic Symptoms*	*GHQ-28 Anxiety/ Insomnia*	*GHQ-28 Social Dysfunction*	*GHQ-28 Severe Depression*	*LSI Total Score*
Physical health	0.62**	0.54**	0.62**	0.46**	0.66**
Mental health	0.56**	0.54**	0.53**	0.51**	0.74**
Social relationships	0.42**	0.38**	0.38**	0.33**	0.76**
Environment	0.11*	0.21**	0.074	0.055	0.35**
Overall QoL/ general health	0.63**	0.55**	0.56**	0.51**	0.70**

*p<0.05, **p<0.01

Convergent validity was further investigated within each of the groups of participants (healthy, psychiatric, physical) producing similar findings (tables 7, 8). In all cases, environment domain demonstrated either no relationship, or mild to moderate correlations with the GHQ-28 sub-scales and the LSI total score. It was also observed that the WHOQOL-BREF social relationships domain accounted for between 62% and 76% of the variance for the LSI total score. This finding supports the validity of social relationships domain consisting of 5 items in the 30-items version, as a good predictor of life satisfaction.

Discriminant validity

The comparison of mean scores between the three groups of participants is shown in table 9. The WHOQOL-BREF discriminated adequately between healthy individuals and patient groups with healthy scoring significantly higher in all four domains, except environment. Differences were also identified between psychiatric patients and physically ill participants, with physically ill achieving higher scores, for all domains with the exception of environment wherein psychiatric patients achieved a slightly higher score.

Test/Re-test reliability

The WHOQOL-BREF was re-administered to healthy participants within 3–4 weeks in order to examine test/retest reliability. The Intraclass Correlation Coefficient (ICC) was applied to the domain scores for both administrations of the instrument. ICC scores in excess of 0.80 were obtained for all domains, demonstrating excellent test-retest reliability (table 10).

Discussion

The present study examines validity and reliability of WHOQOL-BREF 26-items version with the addition of 4 national items. Following WHO guidelines for developing new language versions, focus group participants produced 23 national items, which were subsequently formulated by a panel of researchers to meet the phrasing criteria of WHOQOL items.[30–32] Newly developed items were placed into a separate section of WHOQOL pilot form and were adminis-

Table 7. Pearson's Correlations between WHOQOL-BREF domains, GHQ-28 sub-scales, and LSI total score for healthy participants.

WHOQOL-BREF Domains	*GHQ-28 Somatic Symptoms*	*GHQ-28 Anxiety/ Insomnia*	*GHQ-28 Social Dysfunction*	*GHQ-28 Severe Depression*	*LSI Total Score*
Physical health	0.60**	0.54**	0.45**	0.34*	0.55**
Mental health	0.54**	0.62**	0.35**	0.57**	0.58**
Social relationships	0.28*	0.29*	0.21	0.17	0.70**
Environment	0.17	0.39**	0.12	0.20	0.51**
Overall QoL/ general health	0.49**	0.49**	0.43**	0.42**	0.61**

*p<0.05, **p<0.01

Table 8. Pearson's Correlations between WHOQOL-BREF domains, GHQ-28 sub-scales, and LSI total score for for physically ill (Ph) and psychiatric participants (Ps).

WHOQOL-BREF Domains	*GHQ-28 Somatic Symptoms*		*GHQ-28 Anxiety/ Insomnia*		*GHQ-28 Social Dysfunction*		*GHQ-28 Severe Depression*		*LSI Total*	
	Ph	*PS*	*Ph*	*PS*	*Ph*	*PS*	*Ph*	*PS*	*Ph*	*PS*
Physical health	0.59**	0.59**	0.52**	0.53*	0.55**	0.70**	0.36**	0.67**	0.62**	0.59**
Mental health	0.49**	0.62**	0.50**	0.59*	0.44**	0.69**	0.42**	0.71**	0.57**	0.65**
Social relationships	0.34**	0.51**	0.34**	0.51*	0.30**	0.44**	0.29**	0.47**	0.47**	0.62**
Environment	0.16**	0.21	0.21**	0.27*	0.15*	0.11	0.10	0.33*	0.46**	0.31**
Overall QoL/ general health	0.59**	0.68**	0.54**	0.63*	0.47**	0.66**	0.46**	0.58**	0.44**	0.72**

*p<0.05, **p<0.01, Ph=physical sample, Ps=psychiatric sample, (Note: GHQ-28 scores were reversed)

Table 9. Discriminant validity: Mean score differences between healthy, physically ill and psychiatrically ill participants (ANOVA).

WHOQOL-BREF	*Healthy*	*Physical*	*Psychiatric*	*df*	*F*	*p-value*
Physical health	74.58 (13.40)	63.24 (17.13)	58.06 (17.49)	424	21.32	.000
Mental health	66.79 (12.95)	61.58 (15.68)	53.28 (19.27)	423	17.07	.000
Social relationships	71.49 (13.70)	66.77 (16.77)	54.70 (19.78)	424	27.04	.000
Environment	54.06 (11.69)	57.27 (13.43)	59.23 (13.53)	424	3.34	.036
Overall QoL/ general health	73.69 (16.15)	55.56 (19.75)	52.42 (22.77)	424	27.39	.000

Table 10. Intraclass Correlation Coefficients (ICC) for the healthy sample.

WHOQOL-BREF Domains	*Average measure ICC*
Physical health	.80
Mental health	.87
Social relationships	.87
Environment	.86
Overall QoL/general health	.84

tered to the participants as part of a larger assessment battery.

Next, confirmatory factor analysis (CFA) provided item loadings and indicated objective measures of fit for the WHOQOL-BREF 4-domain model and the fit of new items. The CFA results revealed that the model was fairly good to accommodate the original domain items, while 4 national items loaded signifi-

cantly well on two WHOQOL-BREF domains and were thus included in the Greek version of the instrument producing a 30-item inventory (table 2).

Specifically, 2 new items on nutrition and satisfaction with work were found to load on physical health domain, while other 2 items on home life and social life were found to load onto social relationships domain (Appendix I). The findings appear to reflect values observed within the Greek cultural context giving importance to (a) nutrition with locally produced products; (b) home life with family, partners or alone; (c) social roles performed and acceptance received by others and (d) work including environmental and interpersonal factors. The full content of these facets is presented in a relevant publication on the content of all WHOQOL domains and facets.[42]

These findings are in agreement with international results, proposing national facets or items with similar content in other WHOQOL validation studies. So, in the Taiwan-Chinese versions, two national items were added: one phrased as "being able to get the things you like to eat" loading on the environment domain, and another "having the respect of others" loading on the social relationships domain.[43–44] Also, a facet on eating and appetite has been initially proposed by the Hong Kong WHOQOL centre. In the Chinese-Australian WHOQOL-100, new items were proposed within the existing facets of pain and discomfort, positive feelings, negative feelings and financial resources, while new facets and their items referred to language and literacy and respect and discrimination.[44–45]

Regarding our findings on alpha coefficients, values were very satisfactory supporting internal consistency in all WHOQOL-BREF domains (table 3). We tested the 26-items and the 30-items forms separately and found the latter producing slightly higher alpha scores in the physical health and social relationships domains (tables 3, 4). Thus, we argue that the inclusion of 2 new items within each of the above domains may give strength to domain consistency. Items on nutrition and satisfaction with work seem to add statistical strength and are content consistent with the physical domain. This domain including the level of independence domain items (the original 6 WHOQOL domains merged into 4), has a broader range of items referring to ability to move around, perform work and enjoy various activities. Regarding social relationships domain, inclusion of 2 new items on home life and social life seems to give more power to this domain. The present results support the WHOQOL-BREF 4-domain structure and strengthen particularly social relationships domain, which in several studies restrictions in reliability and validity have been reported.[21]

Further statistical analysis using Pearson's r coefficients produced satisfactory correlations between items and domains and between domain scores. Slightly better values were produced on the 30-items version confirming construct validity of the instrument and supporting further the use of the national version (table 5). Concerning convergent validity, the national version demonstrated goodness to harmonize with other instruments measuring similar concepts, confirming many of the authors' hypotheses. So, physical health and psychological health domains indicated higher correlations with health related sub-scales of GHQ-28 (somatic symptoms and anxiety/insomnia), and social relationships and environment domains with LSI scale

Appendix I. DWHOQOL-BREF: New national items and facets within existing domains.

Domains and facets	*National Items*
Physical health domain	
Facet: Nutrition	1. How healthy and suitable to your needs is the nutrition that you follow?
Facet: Satisfaction with work	2. How much satisfied are you with your job and the employment you have?
Social relationships domain	
Facet: Social life	3. How much satisfied are you with your own social roles and the social activities you are involved with?
Facet: Home life	4. How much satisfied are you with your home life?

including similar content (table 6). Correlations of WHOQOL-BREF with GHQ-28 or LSI were observed in the total sample, as well as in healthy, physical and psychiatric participants (tables 7, 8). Our findings converge with results of several studies providing satisfactory validity of WHOQOL with other associated instruments as i.e. the SF-36, reported in the case of the Brazilian validation study.[46]

Specifically, WHOQOL-BREF physical health and psychological health domains produced –as hypothesized– correlations of moderate to strong values with all four GHQ-28 sub-scales. A milder relationship was identified between WHOQOL-BREF social relationships domain and GHQ-28 sub-scales, supporting the hypothesis of content difference between these measurement tools. The WHOQOL-BREF overall QOL/general health facet demonstrated moderate to strong correlations with all GHQ-28 sub-scales and LSI total score. In addition, as expected, a strong correlation was produced between the WHOQOL-BREF social relationships domain and the total LSI score.

Furthermore, higher correlations were anticipated in the groups of participants with physical or mental disorders. Accordingly, strong correlations were produced between WHOQOL physical health or psychological health domains and the GHQ-28 subscales of social dysfunction and severe depression in the psychiatric participants (table 8).

Application of independent samples t-test and ANOVA investigating the instrument's discriminatory power, verified the assumption that healthy participants would report significantly higher levels of QoL than patient participants. This finding applied to all domains including overall QoL/health facet, with the exception of environment domain (table 9). So, physical health, psychological health and social relationships domains seem to provide higher discriminatory power between groups supporting other international results, e.g. the Polish validation study of the WHOQOL-BREF.[23] It was possible to observe in our study that all groups of participants –healthy, psychiatric, physical– reported relatively lower ratings on the environment domain compared to other domains. Restrictions regarding social services and environmental quality may be suggested to explain this finding. For example, participants from the greater area of Athens reported experiencing low availability and quality of health care, transportation and other facilities. Mean differences between the groups of participants were also observed (table 9) with non-healthy participants reporting relatively higher satisfaction with environment. This finding is in agreement with the Turkish validation study of WHOQOL-BREF arguing that patients of the study might afford a more favorable perspective of their environment because of attention and care provided by health care givers.[47]

Also, discriminatory analysis between patients with physical or mental disorders revealed that physically ill individuals reported higher scores in physical health, psychological health and social relationships domains. It is argued that psychiatric patients in general seem to experience multiple physical, psychological and social deficits, as a result of psychiatric morbidity, leading to poorer ratings in the respective QoL domains. Similar findings were reported in the WHOQOL-100 study.[33] In comparison to healthy individuals, the results of the present study detect reduced QoL in patients with psychiatric or mental disorders and are consistent with previous investigations into self-reported quality of life with similar patient groups, or between subjects with different health conditions.[2–6,9,21]

Concerning sociodemographic variables, participants differed with regard to age and years of education (the healthy subjects being younger and more educated). When the effects of age, education and sex were examined, they were found to be of little influence except the overall QoL/general health facet becoming higher for younger and more educated subjects, and physical health domain for more educated participants. In a study of AIDS pediatric patients in Thailand, sociodemographic factors affecting negatively QoL included age of caregiver (above 45), inadequate financial resources and parental death.[48]

Finally, test-retest reliability was confirmed by Pearson's r and Intraclass Correlation Coefficient (ICC) demonstrating –as expected– that healthy

participants did not report any significant changes in QoL during the time elapsed between administrations of WHOQOL-BREF (table 10).

Improving measurement power of domains

Previous studies indicate that the structure of WHOQOL-BREF with 4 domains and the respective items of facets may reliably measure the concept of QoL in a variety of populations studied.[49] Exception is the Brazilian study not replicating the structure of the original instrument, perhaps because of the population's characteristics, i.e. being working age and relatively healthy.[50]

Most of the studies support the psychometric fitness of physical and psychological health domains, e.g. the Italian WHOQOL-BREF study,[51] while several authors report on the need to strengthen the social relationships domain within the WHOQOL-BREF 4-domain structure.[7,52–54] It is argued that validity of this domain is possibly reduced owing to the limited number of items included.[7,52,53] Accordingly, addition of new items in this domain may provide conceptual power in its assessment, as suggested in the present study.

Regarding the results on environment domain not performing distinctively well as the rest of WHOQOL domains, similar findings have been reported in other studies, referring to restrictions of this domain to discriminate between different patient groups.[47,11] The environment domain may show better discriminatory power with participants experiencing distinct differences in environmental resources or with populations suffering permanent changes in their environmental well-being, i.e. in polluted areas or in physical disasters. This view is supported in the validation study of Bangladesh version showing that environment domain used with adolescent boys, discriminated sufficiently between those living in residential and those of slum areas.[55]

Finally, issues of equivalence between different language versions should not be underestimated in the performance of WHOQOL domains considering that the degree of agreement could be influenced by cultural interpretation of items, facets and domains.[56]

Conclusions

The results of the current study indicate that WHOQOL-BREF Greek version with 4 new items is a valid and reliable tool for measuring QoL in healthy and non-healthy populations. Research and patient-centered use of the instrument can thus be recommended.

Limitations of the study

Investigating psychometric properties, different sampling methodologies can be used including convenience samples besides control selection of participants. In the present study, a non-randomized cross-sectional design, which is common for validation studies, may limit generalizability of findings regarding the specific patient groups, since the selected patients varied i.e. with respect to the stage of the course of illness. QoL profiles of patients with different physical or psychiatric problems are addressed with repeated studies. Also, the reported mean values of groups are considered references to these groups rather than QoL norms.

Authors' contributions

MGC: planning, data collection, analysis, interpretation, preparation, drafting of the manuscript, editing.

ET: data collection, analysis, interpretation, preparation, drafting of the manuscript, editing.

VT: interpretation, editing.

CS: comments on first draft.

VM: interpretation, comments on first draft

GC: comments on first draft, editing.

All authors read and approved the final manuscript

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Ψυχομετρικές ιδιότητες του WHOQOL-BREF σε ομάδες Ελλήνων ασθενών και υγιών ατόμων: Πολιτισμική προσαρμογή με την ενσωμάτωση νέων ερωτήσεων

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Με την παρούσα μελέτη επιδιώκεται ο έλεγχος των ψυχομετρικών ιδιοτήτων της ελληνικής εκδοχής του ερωτηματολογίου WHOQOL-BREF, που αποτελεί τη σύντομη μορφή του ερωτηματολογίου Ποιότητας Ζωής του Παγκόσμιου Οργανισμού Υγείας WHOQOL-100. Η ελληνική εκδοχή περιλαμβάνει τις 26 ερωτήσεις του αγγλικού πρωτοτύπου και 4 επιπλέον ερωτήσεις, που έχουν προκύψει από την προσαρμογή του ερωτηματολογίου (με ομάδες εστιασμένης συζήτησης) στα ελληνικά πολιτισμικά δεδομένα. Η μελέτη του ερωτηματολογίου βασίστηκε σε δείγμα 425 ατόμων, αποτελούμενο από υγιείς και ασθενείς είτε με οργανικές είτε με ψυχιατρικές διαγνώσεις. Με τη μέθοδο της παραγοντικής ανάλυσης, επιβεβαιώθηκε το μοντέλο των τεσσάρων θεματικών ενοτήτων της αγγλικής εκδοχής, στις οποίες εντάσσονται οι 26 ερωτήσεις του πρωτοτύπου. Οι τέσσερεις θεματικές ενότητες και οι αντίστοιχες ερωτήσεις εξετάζουν: (α) τη σωματική υγεία, (β) την ψυχική υγεία, (γ) τις κοινωνικές σχέσεις και (δ) το περιβάλλον. Η παραγοντική ανάλυση ανέδειξε, επίσης, την ένταξη τεσσάρων νέων ερωτήσεων κατάλληλων για την ελληνική εκδοχή του ερωτηματολογίου, ώστε να διαμορφωθεί η ελληνική μορφή των 30 ερωτήσεων. Συγκεκριμένα, 2 ερωτήσεις αναφερόμενες στη διατροφή και στην εργασιακή ικανοποίηση εντάσσονται ικανοποιητικά με στατιστικά κριτήρια στην πρώτη ενότητα της σωματικής υγείας. Οι άλλες δύο ερωτήσεις αναφερόμενες στην κοινωνική ζωή και στην οικογενειακή ζωή ενσωματώνονται ικανοποιητικά στην τρίτη ενότητα των κοινωνικών σχέσεων. Στη συνέχεια, οι στατιστικές αναλύσεις της εσωτερικής συνέπειας εφαρμόστηκαν και στις δύο μορφές του ερωτηματολογίου, των 26 και των 30 λημμάτων, αναδεικνύοντας σχετικά καλύτερα αποτελέσματα για τη μορφή των 30 ερωτήσεων, κυρίως αναφορικά με την τρίτη ενότητα των κοινωνικών σχέσεων. Η ελληνική εκδοχή του ερωτηματολογίου, σύμφωνα με τα αποτελέσματα του ελέγχου των ψυχομετρικών ιδιοτήτων, παρουσιάζει ικανοποιητικά επίπεδα: (α) αξιοπιστίας εσωτερικής συνέπειας, με την τιμή Cronbach's a να κυμαίνεται από 0,67–0,81 (η μορφή των 30 ερωτήσεων περιλαμβάνοντας 4 νέες ερωτήσεις παρουσίασε υψηλότερες τιμές Cronbach's a, με αποτέλεσμα την ενίσχυση των θεματικών ενοτήτων της σωματικής υγείας και των κοινωνικών σχέσεων), (β) εγκυρότητας εννοιολογικής κατασκευής, αναδεικνύοντας ικανοποιητικές συσχετίσεις μεταξύ των ερωτήσεων και των θεματικών ενοτήτων, καθώς και μεταξύ των ερωτήσεων σε κάθε θεματική ενότητα, (γ) συγκλίνουσας εγκυρότητας, καθώς εντοπίζονται σημαντικές συσχετίσεις με το Ερωτηματολόγιο Γενικής Υγείας (GHQ-28) και με την Κλίμακα Ικανοποίησης Ζωής (LSI), (δ) διακριτικής εγκυρότητας, εξασφαλίζοντας την ικανότητα του ερωτηματολογίου να ανιχνεύει διαφορές μεταξύ υγιών και ασθενών και μεταξύ ατόμων με σωματικές νόσους και ασθενών που πάσχουν από ψυχικές διαταραχές και (ε) αξιοπιστίας ελέγχου-επανελέγχου (ICC τιμές για όλες τις θεματικές ενότητες: 0,80–0,87). Η

ελληνική εκδοχή, περιλαμβάνοντας 4 νέες ερωτήσεις που προέκυψαν στο πλαίσιο της πολιτισμικής προσαρμογής του ερωτηματολογίου, αποτελεί ένα αξιόπιστο και έγκυρο εργαλείο εκτίμησης της ποιότητας ζωής, το οποίο μπορεί να χρησιμοποιηθεί στον ευρύτερο χώρο της Υγείας για την αξιολόγηση της ποιότητας ζωής κλινικών ομάδων, αλλά και υγιών ατόμων. Επίσης, αποτελεί κατάλληλο δείκτη αξιολόγησης του θεραπευτικού αποτελέσματος και των παρεχόμενων υπηρεσιών υγείας, αλλά και αξιόπιστο εργαλείο διερεύνησης της ποιότητας ζωής στο πλαίσιο διαπολιτισμικών μελετών.

Λέξεις ευρετηρίου: WHOROL-BREF, εγκυρότητα, αξιοπιστία, ποιότητα ζωής, σωματική νόσος, ψυχική διαταραχή.

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