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Brief communication

Reliability and validity of the European Portuguese version of the quality of life index EUROHIS-QOL-8 in HIV-infected patients

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ABSTRACT

The purpose of this study was to examine the reliability and validity of the EUROHIS-QOL 8-index in a sample of 1197 HIV-infected patients, recruited in the departments of infectious diseases of 10 Portuguese hospitals. The EUROHIS-QOL-8 index showed good internal consistency (Cronbach's alpha = 0.85) adequate construct, convergent and known-groups validity. Confirmatory factor analysis supported its unidimensional structure. The properties of the EUROHIS-QOL 8-index support its use in the Portuguese HIV population, particularly in large studies requiring the assessment of multiple health indicators and in studies needing more practical, shorter, and easier to apply instruments for assessing quality of life.

Fiabilidade e validade da versão em português europeu do índice de qualidade de vida EUROHIS-QOL-8 numa amostra de doentes infetados pelo VIH

Palavras-chave:
EUROHIS-QOL-8
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RESUMO

O objetivo deste estudo foi avaliar a fiabilidade e validade do índice de qualidade de vida EUROHIS-QOL-8 numa amostra constituída por 1.197 doentes infetados pelo VIH, recrutados nos departamentos de doenças infeciosas de 10 hospitais portugueses. O índice EUROHIS-QOL-8 apresentou boa consistência interna (alfa de Cronbach = 0,85) e adequada validade de constructo, convergente e de grupos conhecidos. A análise fatorial confirmatória corroborou a estrutura unidimensional do índice. As propriedades psicométricas do índice

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EUROHIS-QOL 8 suportam o seu uso na população portuguesa infetada pelo VIH, particularmente em estudos de grande dimensão que requerem múltiplos indicadores de saúde e em estudos que necessitem de instrumentos de avaliação da qualidade de vida mais práticos, breves e fáceis de aplicar.

Introduction

Quality of life (QOL), as defined by the World Health Organization, encompasses an individual's perception of his or her own physical, psychological, social, and environmental well-being, in view of their culture and value systems, as well as his or her goals, expectations, standards and concerns.[1] Quality of life has been increasingly used as a health indicator in clinical practice and in public health research, and is particularly relevant in the context of HIV.[2,3]

Among the historical developments in the QOL assessment, a recent trend concerns the development of short measures for assessing QOL more economically.[4] The rationale behind the development of these shortened versions is multifold: first, they provide a more practical, easier, and more economical assessment; second, they may be used not only as monitoring instruments in large epidemiological and health surveys, but also for screening purposes in clinical studies.[5,6] From this perspective, and within the EUROHIS project,[7] the EUROHIS-QOL 8-index was developed as a shortened version of the WHOQOL-Bref.[8]

As the original instruments, the EUROHIS-QOL 8-index provides a generic measurement of subjective QOL, covering physical, psychological, social, and environmental aspects.[8,9] The cross-cultural field study of the EUROHIS-QOL 8-index showed good reliability and validity across a range of countries, and a universal one-factor structure with a good fit in confirmatory factor analysis (CFA) was identified.[6] More recently, this unidimensional structure was further confirmed in the Longitudinal Investigation of Depression Outcomes, a multicentre study with patients with depressive disorders in primary care settings.[5] However, the psychometric properties in HIV-infected patients remain understudied. Given this dearth of information, based on a secondary data analysis from a larger study, we present the reliability and validity of the EUROHIS-QOL 8-index in a sample of HIV-infected patients.

Methods

Study population and procedures

This study is part of a large prospective study investigating QOL and mental health of persons living with HIV. The study sample was recruited by convenience sampling, and comprised 1197 HIV-infected patients contacting the main departments of infectious diseases of 10 Portuguese hospitals. A detailed description of the methodology used in this study has been reported elsewhere.[10] In brief, the general inclusion criteria were age (≥18 years), diagnosis of HIV, and sufficient knowledge of Portuguese to complete the assessment protocol.

Patients were invited to participate in the study while attending the medical consultation with their infectious disease specialist. A total of 1251 patients were contacted between September 2007 and July 2008. Patients who did not complete the assessment protocol (>20% of missing data; $n = 54$) were considered ineligible for the analyses. All participants were informed of the aims of the study and those who agreed to participate provided informed consent. Ethical approval to conduct the study was obtained from the Ethics Committees of all institutions involved.

Measures

The EUROHIS-QOL 8-index is composed of eight items (assessing overall QOL, general health, energy, daily activities, self-esteem, relationships, financial resources, and living place), taken from the generic items of WHOQOL-HIV-Bref (see the items of European Portuguese version of the EUROHIS-QOL 8-index in Annex 1). Similarly to the original measure, each question is answered on a five-point scale, and each scale point was specified with a number and a verbal descriptor. The four response scales developed were concerned with intensity (for instance from "not at all" to "completely") and evaluation (for instance from "very dissatisfied" to "very satisfied"). The overall score is calculated by adding the scores on the eight items, with higher scores indicating better QOL.

The Brief Symptom Inventory (BSI)[11] is a 53-item self-report inventory associated with psychological distress. Respondents are asked to rate the extent to which each identified problem has caused them discomfort in the past week, using a five-point scale ranging from *Never* (0) to *Very often* (4). The BSI assesses nine psychopathological dimensions and three global indices.

In addition, participants provided information regarding gender, age, employment status, marital status, education, mode of transmission, CD4+ T cell count, and year of infection. CD4+ T cell count, based on clinically meaningful cut-off points, was stratified into three groups: <200 cells/mm,[3] 201–499 cells/mm,[3] and >500 cells/mm.[3] As an overall indicator of morbidity, participants rated their general health status by answering the question: "How would you rate your health?", on a five-point scale ranging from Very poor (1) to Very good (5).

Data analysis

Data were analyzed using the Statistical Package for Social Sciences (IBM-SPSS 20.0). Analysis of Moment Structures (AMOS) was used to perform a CFA. Descriptive statistics (frequencies, mean, median, standard deviation and interquartile range) were first calculated in order to explore the sample's characteristics, the item's descriptive statistics, and floor and ceiling effects. The CFA was performed to assess the goodness of fit of the model. The maximum likelihood method was selected for parameter estimation. The CFA was performed to assess the goodness of fit of the model. Goodness of fit was verified by the following fit indices: χ^2 statistic, comparative fit index (CFI), standardized root mean square residual (SRMR), and root mean square error of approximation (RMSEA). Models are considered to have a good fit when: CFI > 0.90, SRMR < 0.08, and RMSEA < 0.06.[12] The known-groups validity was analyzed by performing a Kruskal–Wallis test. Post hoc comparisons were analyzed by conducting a series of Mann–Whitney tests with Bonferroni correction (adjusting the p value to 0.017). Spearman's rho correlations were computed to determine the convergent validity. All tests were two-tailed with $p < 0.05$ indicating statistical significance.

Results

Participants' characteristics

The total sample consisted of 1197 HIV-infected patients, with a mean age of 40.72 years ($SD = 9.71$; range: 18–81) and a mean education of 8.01 years ($SD = 4.04$; range: 4–17). Most patients were male (67.5%), employed (50.1%), single (44.6%) or married/cohabiting (33.4%), asymptomatic (61.4%), and were diagnosed with HIV for 8.05 years ($SD = 5.17$; range: 0–28). Regarding HIV acquisition, most participants reported sexual transmission (62.2%) and IV drug use (32.3%). The mean CD4+ T cell count per mm3 was 420.82 ($SD = 279.57$; range: 2–1693).

Acceptability and reliability

An overview of the EUROHIS-QOL 8-index scores distribution, acceptability and reliability is presented in Table 1. Overall, this index showed low to moderate floor and ceiling effects. The Cronbach's alpha of the EUROHIS-QOL 8-index was 0.85.

Construct validity

A CFA was used to examine the unidimensional structure of the EUROHIS-QOL 8-index. The initial model did not fit the data sufficiently [$\chi^2 = 397.38$, $df = 20$, $p < 0.001$; CFI = 0.89; RMSEA = 0.13 (90% CI 0.12–0.14); SRMR = 0.05]. The modification indices suggested several improvements for the unidimensional model. To improve fit, we allowed a minimal number of supplementary correlated error residuals (Fig. 1); suggestions considered not to be plausible were not added. Thus, adding error covariances between items 1 (overall QOL) and 2 (general health), items 1 (overall QOL) and 7 (financial resources), items 3 (energy) and 4 (daily activities), and between items 5 (self-esteem) and 6 (relationships) improved

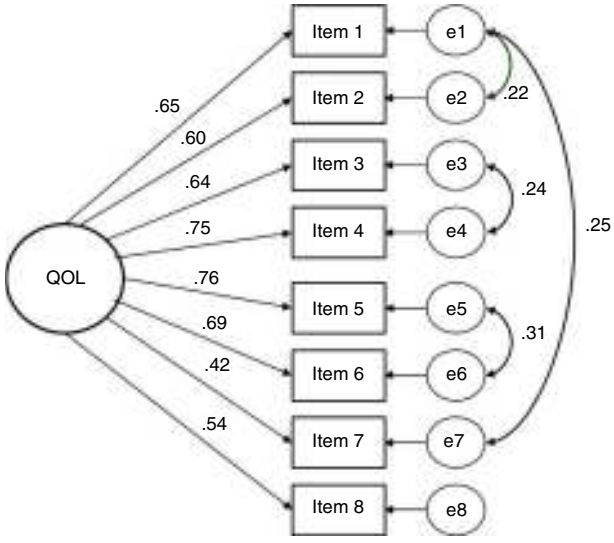

Fig. 1 – CFA for the eight items of the EUROHIS-QOL 8-index with one latent variable (QOL), adjusted for covariances.

the model's fit significantly ($\chi_{diff}^2 = 269.66$, $\Delta df = 4$, $p < 0.001$). Apart from the χ^2 statistic, which is very sensitive to the sample size, the other indices support the acceptability of the improved unidimensional model [$\chi^2 = 127.72$, $df = 16$, $p < 0.001$; CFI = 0.97; RMSEA = 0.08 (90% CI 0.06–0.09); SRMR = 0.03].

Convergent validity

The correlations between the EUROHIS-QOL 8-index and different measures were all significant ($p < 0.001$). The correlations with the psychopathological dimensions ranged from −0.42 (Phobic Anxiety) to −0.62 (Depression). The correlation with health status was 0.54. The correlations with the WHOQOL-HIV-Bref domains ranged from 0.45 (Spirituality) to 0.80 (Psychological).

Known-groups validity

The known-groups validity of the EUROHIS-QOL 8-index was conducted to examine how well the index discriminated among asymptomatic, symptomatic and AIDS patients, as well as CD4 count subgroups. The results were statistically significant both regarding HIV stage and CD4+ T cell count (Table 2). Overall, asymptomatic and patients with CD4+ T cell counts > 500 cells/mm^3 reported higher scores of QOL.

Discussion

Given the growing interest in the construction of short forms and indices in QOL assessment, as economic alternative versions to a respective original measure, this study tested the reliability and validity of the EUROHIS-QOL 8-index in a sample of HIV-infected patients, being the first doing so. Also supporting its cross-cultural perspective, our findings illustrate the acceptable psychometric properties of the EUROHIS-QOL 8-index, in terms of internal consistency, convergent and known-groups validity, and factorial validity.

Table 1 – Descriptive statistics for the eight items of the EUROHIS-QOL 8-item index (N = 1197).

	EUROHIS-QOL 8-item index	Median	IQR[a]	Floor (%)	Ceiling (%)	$r_{item\text{-}total}$	α[b]
1	How would you rate your quality of life?	3	1	4.5	3.5	0.65	0.83
2	How satisfied are you with your health?	3	2	6.6	3.9	0.55	0.84
3	Do you have enough energy for everyday life?	3	1	4.0	13.4	0.61	0.83
4	How satisfied are you with your ability to perform your daily activities?	4	1	2.8	13.3	0.69	0.82
5	How satisfied are you with yourself?	4	1	4.6	15.8	0.69	0.82
6	How satisfied are you with your personal relationships?	4	1	3.3	14.5	0.64	0.83
7	Have you enough money to meet your needs?	2	1	18.9	3.8	0.42	0.85
8	How satisfied are you with the conditions of your living place?	4	1	4.2	14.8	0.49	0.85

[a] Interquartile range.
[b] Cronbach's alpha if item deleted.

As regard the internal structure, the one-factor model achieved a good fit; however, some modifications were needed to improve the model fit. These improvements in the fit demonstrate not only that the one-factor model fits the data, but also the importance of financial resources and global health for the general rating of QOL. Similar results were observed in the validation of this index in the Portuguese general population[13] and in the Romanian sample of the cross-cultural study.[6] Additionally, the error variances of self-esteem and relationships, which were allowed to covary, may illustrate the importance of relationships for a person's self-esteem, as there is evidence that close relationships are especially relevant for the well-being of people living with HIV.[14] Such influences are currently emerging as major themes in QOL research in this population.[15]

The EUROHIS-QOL 8-index presents an adequate convergent validity, according to the moderate-to-high correlations observed with the WHOQOL-HIV-Bref domains, perceived health status, and psychopathological domains. These results are consistent with prior validation studies.[5,6] Supporting the known-groups validity, this index was able to discriminate patients according to HIV stage and CD4+ T cell count subgroups. Better QOL was reported among individuals with less advanced disease, which is consistent with prior work with the longer versions of the instrument.[2,16]

Table 2 – Known-groups validity of the EUROHIS-QOL 8-item index.

	Mean rank	χ^2
HIV stage (n = 1127)[a]		44.49***
Asymptomatic	611.06	
Symptomatic	459.49	
AIDS	487.54	
CD4+ T cell count (n = 1066)[b]		54.06***
<200 cells/mm^3	416.57	
201–499 cells/mm^3	543.80	
>500 cells/mm^3	600.25	

[a] Asymptomatic significantly different from Symptomatic ($p < 0.001$) and AIDS ($p < 0.001$).
[b] <200 cells/mm^3 significantly different from 201 to 499 cells/mm^3 ($p < 0.001$) and >500 cells/mm^3 ($p < 0.001$); 201–499 cells/mm^3 significantly different from >500 cells/mm^3 ($p = 0.008$).
*** $p < 0.001$.

As previously noted in similar studies,[5] it is important to note that our aim is not to suggest that the EUROHIS-QOL 8-index should replace the generic measure, particularly given the inherent multidimensionality of the QOL construct. However, beyond the psychometric performance, this index presents important advantages, including economy/efficiency, simplicity/practicability, and, principally, representation of the construct of QOL.

Some limitations should be acknowledged in this study. First, limitations imposed by the non-probabilistic sample and the cross-sectional study design must be considered when interpreting the results, as statistical inferences cannot be made. Second, the data fitted the model to a sufficient degree only when error variances of "paired" items were included. Although this procedure does not yield a parsimonious model, this is a common practice in QOL research.[5] Therefore, it would be relevant to consider in future analyses of the EUROHIS-QOL 8-index, particularly those with comparative purposes, the specifications that were used in this study. This will be important to replicate and extend the generalizability of this model. Lastly, as this study is based on secondary data, where participants did not fill in the actual EUROHIS-QOL 8-index, comparability between the index score performance and the total score performance of the WHOQOL-HIV-Bref was not adjusted for shared error, as it was examined using a set of eight common items with data from the same sample. Although this procedure has been criticized,[17] there is no satisfactory alternative available.[18] Future studies should administer both forms to the same sample in order to more accurately assess the agreement between the short and the standard forms.

In summary, the EUROHIS-QOL 8-index showed promising psychometric properties and may be a valid tool for the assessment of QOL among HIV-patients, particularly in studies needing more economic, practical, and easier to apply measures for assessing QOL.

Conflicts of interest

The authors have no conflicts of interest to declare.

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Annex 1. European Portuguese version of the EUROHIS-QOL-8 Questionnaire

1	Como avalia a sua qualidade de vida?
2	Até que ponto está satisfeito(a) com a sua saúde?
3	Tem energia suficiente para a sua vida diária?
4	Até que ponto está satisfeito(a) com a sua capacidade para desempenhar as actividades do seu dia-a-dia?
5	Até que ponto está satisfeito(a) consigo próprio(a)?
6	Até que ponto está satisfeito(a) com as suas relações pessoais?
7	Tem dinheiro suficiente para satisfazer as suas necessidades?
8	Até que ponto está satisfeito(a) com as condições do lugar em que vive?

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