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Marcelo P Fleck

Eduardo Chachamovich

Clarissa Trentini

# Development and validation of the Portuguese version of the WHOQOL-OLD module

## Desenvolvimento e validação da versão em Português do módulo WHOQOL-OLD

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### ABSTRACT

**OBJECTIVE:** The increasing proportion of older adults in the general population and the specific characteristics of this age group show the need for the development of specific instruments to measure quality of life in older adults. The study aimed at describing the development and validation of the Portuguese version of the World Health Organization Quality of Life for Older Persons (WHOQOL-OLD) module.

**METHODS:** The WHOQOL-OLD instrument was administered in a sample of 424 older adults in the city of Porto Alegre, Southern Brazil, in 2005. The questionnaire comprises 24 items divided into six facets: sensory abilities; autonomy; past, present and future activities; social participation; death and dying; and intimacy. Besides the WHOQOL-OLD module, the WHOQOL-BREF, BDI and BHS instruments were also applied. The instrument's internal consistency was assessed using Cronbach's alpha coefficient.

**RESULTS:** The instrument showed adequate internal consistency (Cronbach's coefficients ranging from 0.71 to 0.88), discriminant validity ( $p < 0.01$ ), concurrent validity (correlation coefficients ranging from -0.61 to -0.50) and test-retest reliability (correlation coefficients ranging from 0.58 to 0.82). Findings concerning criterion validity need further studies.

**CONCLUSIONS:** The WHOQOL-Old module is a useful alternative with good psychometric performance in the investigation of quality of life in older adults.

**KEYWORDS:** Aged. Quality of life. Evaluation of research programs and tools. Validity of tests. World Health Organization. WHOQOL-OLD.

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### RESUMO

**OBJETIVO:** O aumento da proporção de idosos na população geral e as particularidades que esta faixa etária apresenta apontam a necessidade do desenvolvimento de instrumentos específicos para a aferição de sua qualidade de vida. O objetivo foi descrever o desenvolvimento e a validação da versão em português do módulo específico para idosos do questionário de qualidade de vida (WHOQOL-OLD).

**MÉTODOS:** O instrumento WHOQOL-OLD foi aplicado em amostra de 424 idosos na cidade de Porto Alegre, RS, em 2005. O questionário é composto por 24 itens divididos em seis facetas: funcionamento dos sentidos, autonomia, atividades passadas, presentes e futuras, participação social, morte e morrer, e intimidade. Além do Módulo

Departamento de Psiquiatria e Medicina  
Legal. Universidade Federal do Rio  
Grande do Sul. Porto Alegre, RS, Brasil

**Correspondence:**

Eduardo Chachamovich  
R. Ramiro Barcelos, 2400 2º andar Santana  
90035-003 Porto Alegre, RS, Brasil  
E-mail: echacha.ez@terra.com.br

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WHOQOL-OLD, os instrumentos WHOQOL-BREF, BDI e BHS também foram aplicados. A consistência interna do instrumento foi verificada pelo coeficiente alpha de Cronbach.

**RESULTADOS:** O instrumento mostrou características satisfatórias de consistência interna (Coeficientes de Cronbach de 0,71 a 0,88), validade discriminante ( $p < 0,01$ ), validade concorrente (Coeficientes de correlação entre -0,61 e -0,50) e fidedignidade teste-reteste (Coeficientes de correlação entre 0,58 a 0,82). A validade de critério apresentou achados que necessitam complementação de futuras investigações.

**CONCLUSÕES:** O Módulo WHOQOL-OLD representa uma alternativa útil e com bom desempenho psicométrico na investigação de qualidade de vida em idosos.

**DESCRIPTORIOS:** idosos. Qualidade de vida. Avaliação de programas e instrumentos de pesquisa. Validade dos testes. Organização Mundial de Saúde. WHOQOL-OLD.

## INTRODUCTION

Older adult population has been increasing remarkably, not only in developed countries, but also in developing ones. In Brazil, the population in general has been aging significantly in the last 40 years. The *Pesquisa Nacional por Amostra de Domicílios* published by the *Instituto Brasileiro de Geografia e Estatística* in 2005 (data referring to 2004), shows that the total number of older adults living in Brazil is approximately 17 million, corresponding to 9.8% of the total population. Life expectancy at birth in Brazil has reached 71.7 years, which adds up 9.1 years comparing to 1980.

The aging process causes relevant changes in the demands and needs of the Brazilian health system (Chaimowitz,<sup>7</sup> 1997). The rectangularization of the population pyramid brings direct impacts on resource allocation for health policies. Infectious diseases, more associated to the young population and to reduced course, are slowly being replaced by an increasing prevalence of chronic-degenerative diseases (due to the healing or death dichotomy) (Ramos,<sup>19</sup> 2003).

Besides investigating and determining the pace of the population's aging, there is also a concern about studying the quality of aging and, later, designing interventions able to cause impact towards a healthy aging process. Therefore, researchers in geriatrics are increasingly interested in determining which factors are relevant to the quality of life in older adults (Browne et al,<sup>5</sup> 1994; Farquhar,<sup>11</sup> 1995; Santos,<sup>20</sup> 2002; Xavier et al,<sup>23</sup> 2003; Sousa et al,<sup>21</sup> 2003; Fleck et al,<sup>14</sup> 2003; Evans et al,<sup>10</sup> 2005; Chachamovich et al,<sup>8</sup> 2006).

Fleck et al<sup>14</sup> (2003) carried out a study with focus

groups for investigating the concept of quality of life and its determinants in Brazilian older adults. According to the methodology suggested by the World Health Organization (WHO), it was shown that the concept of quality of life (QoL) is especially related to well-being, positive feelings and health. Results indicated that the items of the WHOQOL-100 instrument are appropriate and relevant for measuring quality of life in older adults, but they are not comprehensive enough. There are fundamental aspects in the composition of quality of life in older adults which are not included in the WHOQOL-100 instrument (and, consequently, in the WHOQOL-BREF, since this is a condensed version of the former). Thus, the focus groups stress that the elderly population shows specific characteristics that need be included in the instruments used so that quality of life can be properly measured. Pearlman & Uhlmann<sup>16</sup> (1988) corroborate Fleck et al<sup>14</sup> findings by pointing out that several instruments used for measuring quality of life do not take into consideration areas of life which are identified as fundamental by the older adults, such as family relationships.

Power et al<sup>18</sup> (2005), representing the WHOQOL group, emphasize that, due to the specificities shown by older adult population in the different centers involved in international data collection, there is a need to develop quality of life measurement tools directed to older adults and test them in a transcultural context.

This study aimed at describing the development and validation of the WHOQOL-OLD module in Brazil. This is a specific complementary instrument for the assessment of quality of life in older adults that can provide additional information concerning quality of life in this specific population.

**Table 1** - Final set of items of the WHOQOL-OLD module.

Facets		Items
Facet I	Sensory abilities	Impairments to senses affect daily life Loss of sensory abilities affect participation in activities Problems with sensory functioning affect ability to interact Rate sensory functioning
Facet II	Autonomy	Freedom to make own decisions Feel in control of your future People around you are respectful of your freedom Able to do things you'd like
Facet III	Past, present and future activities	Satisfied with opportunities to continue achieving Received the recognition you deserve in life Satisfied with what you've achieved in life Happy with things to look forward to
Facet IV	Social participation	Have enough to do each day Satisfied with the way you use your time Satisfied with your level of activity Satisfied with your opportunity to participate in the community
Facet V	Death and dying	Concerned about the way you will die Afraid of not being able to control death Scared of dying Fear pain before death
Facet VI	Intimacy	Feel a sense of companionship in life Experience love in your life Opportunities to love Opportunities to be loved

## METHODS

The WHOQOL-OLD module was designed aiming at developing and testing a valid quality of life assessment instrument for older adults. The aim of the project was to develop and test a generic QoL measurement tool capable of being used in cross-cultural investigations. Although the international development of the WHOQOL-OLD project is described in more details elsewhere (Power et al,<sup>18</sup> 2005), an overview of the Brazilian Center's participation is provided below.

Firstly, the WHOQOL-OLD development followed the previous experience of the WHOQOL Group in international collaborative projects with WHOQOL-100 and WHOQOL-BREF,<sup>22</sup> through simultaneous transcultural methodology (Guillemin et al,<sup>15</sup> 1993; Bullinger et al,<sup>7</sup> 1996; Power et al,<sup>17</sup> 1999). The initial phase was a discussion including 22 participating centers in order to obtain consensus about the construct and factors to be studied.

After that, focus groups and item generation were carried out (Fleck et al,<sup>14</sup> 2003), analyzed with the international items for the development of a pilot module. The instrument was translated in each center following the methodology proposed by the WHO (Fleck et al,<sup>12</sup> 1999; Fleck et al,<sup>13</sup> 2000).

The next step consisted of refining, item reduction and pilot testing of the initial 40-item WHOQOL-OLD version. The pilot test was performed in Brazil with 339 subjects (average age 73.4,  $\pm 8.3$ ; 56%

women; 57.5% subjects with healthy perceived status). After this first application, the psychometric analysis of the items' performance was conducted in order to develop the field version to be tested in the 20 centers participating in this phase, involving a total of 5,566 subjects. The field test involved the application of the 33-item module, as well as the WHOQOL-BREF instrument.

After re-analysis of the data obtained in the field test, the final version of the WHOQOL-OLD module comprised 24 items recorded in a five-point Likert scale, divided into six facets. Each facet consists of four items, and thus generates independent scores ranging from 4 to 20 points (converted through syntax into a 0-100 scale). The six facets scores, combined with the answers of the 24 items, result in the overall score of the instrument. As for other WHOQOL instruments, higher scores represent better quality of life in the facets.

The WHOQOL-OLD module can be self-administered, administered with the interviewer's help or completely administered by the interviewer. In cases where interviewer's participation is required, they are asked not to interfere with the subjects' understanding of the items as well as not rephrasing or supplying synonyms to the words used in the instrument in order to keep its original characteristics.

According to the WHOQOL-OLD project, it would be necessary a minimum sample size of 300 subjects stratified by gender (50% women and 50% men), age

**Table 2** - Sociodemographic and clinical characteristics of the sample (N=424). Southern Brazil, 2003-2005.

Age	N (%) or M (SD)
60-69 years old	173 (40,9)
70-79 years old	153 (36,2)
80 years old	97 (22,9)
Gender	
Male	152 (35,8)
Female	272 (64,2)
Perceived health status	
Healthy	286 (67,5)
Unhealthy	138 (32,5)
Marital status	
Single	29 (6,8)
Married	212 (50,0)
Separated	30 (7,1)
Widowed	128 (30,2)
Educational level	
Illiterate	7 (1,7)
Elementary and middle school	165 (38,9)
High school	110 (25,9)
College	90 (21,2)
Beck Depression Inventory	9.05 (7,08)
Beck Hopelessness Scale	4.80 (4,16)

groups (60-69 years, 70-79 years, and over 80) and perceived health status (50% considering themselves healthy and 50% unhealthy), selected at university hospital, nursing homes, and community. Convenience sampling was used. The stratification process provided minimum subsamples that allowed for the instrument's assessment in different conditions. Subjects were recruited and interviewed in a city of Southern Brazil between September 2003 and March 2005.

Inclusion criteria were age 60 or above and clinical ability to understand and answer the instruments administered. Subjects were interviewed and answered the question "In general, do you consider yourself healthy or unhealthy?", and were then stratified as healthy or unhealthy solely according to their subjective perception, not considering their actual health status (The WHOQOL Group,<sup>22</sup> 1998; Fleck et al,<sup>12</sup> 1999).

Of the whole sample, 51 subjects selected by convenience sampling were re-interviewed two weeks after the initial interview, in order to assess the test-retest reliability of the instrument.

Besides the WHOQOL-OLD, the instruments below were also applied for inter-instruments testing (validity).

- Sociodemographic data form;
- WHOQOL-BREF (Fleck et al,<sup>13</sup> 2000);
- Beck Depression Inventory (BDI) (Beck et al,<sup>1</sup> 1961): for assessing the presence and level of depressive symptoms. Validated in the Portuguese version (Cunha,<sup>9</sup> 2001), it proved to be suitable for studying clinical and non-clinical populations. It supplies a 0-63 index that shows the severity of depressive symptoms;

- Beck Hopelessness Scale (BDS) (Beck et al,<sup>2</sup> 1974): for assessing the presence and severity of hopelessness symptoms. Also validated in the Portuguese version (Cunha,<sup>9</sup> 2001), it provides a 0-20 index that shows the intensity of hopelessness symptoms.

The internal consistency of the WHOQOL-OLD was assessed through Cronbach's alpha coefficient. The facets were individually analyzed and a reliability coefficient was also determined for the set of 24 items.

To assess criterion validity, multiple linear regression showed that the four domains of the WHOQOL-BREF were significant in the proposed model, using the variance of the answer to the question "How would you rate your quality of life" (G1 item in the WHOQOL-BREF instrument) as the dependent variable.

For the assessment of concurrent validity, correlation coefficients between total scores of the BHS and BDI scales and the scores of the six facets and overall scores of the WHOQOL-OLD module were analyzed.

All respondents were informed about the purposes of the study and the confidentiality of the data obtained. Subjects received and signed an informed consent approved by the Research Ethics Committee of the university hospital in which the study was carried out. Methodology followed the principles of the Declaration of Helsinki. Interviewers were medicine and psychology undergraduates previously trained for the application of the instruments used.

## RESULTS

The final sample comprised 424 subjects whose demographic and clinical characteristics are described in Table 2. This large sample ensures that statistical tests required to assess the instrument's psychometric performance can be properly conducted. BDI and BHS score means showed that the sample was predominantly comprised of non-depressed older adults without hopelessness symptoms.

Cronbach's alpha coefficients were suitable when assessed by facet or by the set of items, ranging from 0.710 (autonomy) to 0.885 (overall). Mean scores of each facet and overall scores between the group of older adults with minimum and higher than minimum intensity of depressive symptoms (mild, moderate or severe) were compared. Similarly, the difference of mean scores of each facet and overall scores between the groups that considered themselves healthy and unhealthy was tested. Table 3 shows data related to the analysis of discriminant validity. All

**Table 3** - Comparison of WHOQOL-OLD facet scores according to depressive symptoms level and perceived health status (N=424). Southern Brazil, 2003-2005.

Facets	Depressive symptoms				Perceived health status			
	BDI minimal (0-11)	Mean (SD) BDI>minimal (>12)	t	p-value	Mean (SD) Healthy	Mean (SD) Unhealthy	t	p-value
Sensory abilities	77.99 (19.36)	64.39 (22.50)	6.06	0.000	78.85 (18.42)	63.09 (23.01)	7.01	0.000
Autonomy	70.79 (15.63)	54.88 (18.91)	8.46	0.000	69.93 (15.53)	57.24 (20.47)	6.43	0.000
Past, present and future activities	71.82 (15.41)	55.45 (17.65)	9.21	0.000	71.70 (14.47)	56.29 (19.18)	8.32	0.000
Social participation	71.13 (15.64)	50.79 (19.34)	10.63	0.000	70.78 (15.07)	52.26 (21.17)	9.21	0.000
Death and dying	66.85 (23.75)	57.89 (27.59)	3.23	0.001	65.21 (24.88)	61.59 (26.16)	1.38	0.168
Intimacy	72.57 (19.53)	53.43 (22.96)	8.32	0.000	70.00 (20.98)	59.42 (23.85)	4.44	0.000
Overall	71.79 (11.30)	56.17 (12.24)	12.41	0.000	71.00 (11.01)	58.37 (14.71)	8.90	0.000

BDI: Beck Depression Inventory

t: Independent t-tests

facets and overall scores indicated significant differences when compared between the groups, showing suitable discriminant capacity.

Among the six facets of the OLD module, however, four were statistically significant (using  $\alpha=0.1$ , a less strict value, since it is an exploratory analysis). The current model explains 51.1% of the dependent variable variance.

Therefore, the facets "sensory abilities" and "intimacy" did not show statistical significance in this model (Table 4).

All correlations of the BHS and BDI scales and the scores of the six facets and overall of the WHOQOL-OLD showed statistically significant levels. Negative coefficients indicated that the higher the hopelessness and depressive symptoms levels, the worse the quality of life facet scores.

The facet "death and dying" showed the lowest correlation coefficients with both scales (-0.124 against BHS and -0.222 against BDI), while the other facets and overall had similar and satisfactory performance. The highest correlation was observed in overall scores (-0.615 against BDI and -0.505 against BHS).

There were no significant differences in the score means of the facets and overall scores between test and retest assessments (Table 5).

The correlation coefficients of facet and overall scores between test and retest were obtained, showing suitable and statistically significant values. Data analyzed as a whole showed that the instrument had good test-retest reliability, with values ranging from 0.584 (Autonomy and Intimacy facets) up to 0.820 (overall).

## DISCUSSION

The instrument showed good internal consistency measured by Cronbach's alpha coefficient in each facet as well as in the set of items. The coefficients are close to the ones described for the whole international sample (Power et al,<sup>18</sup> 2005) and higher than the ones found in the WHOQOL-100 and WHOQOL-BREF in their validation processes (Fleck et al,<sup>12</sup> 1999; Fleck et al,<sup>13</sup> 2000), corroborating the appropriateness of the module's consistency.

In regard to criterion validity, four out of six facets were included in the multiple linear regression module and explained, as well as the four domains of WHOQOL-BREF, 51.1% of the variance. Once the facets included in the WHOQOL-OLD module were suggested and analyzed by the focus groups, there was discrepancy between the theoretical basis of the items and their psychometric performance. Four hypotheses were formulated to explain these findings.

The first one, of conceptual nature, suggests that these facets (sensory abilities and intimacy) may not be in

**Table 4** - Results of multiple linear regression analysis between WHOQOL-BREF domains and WHOQOL-OLD facets and item G1 "How would you rate your quality of life" (WHOQOL-BREF). Southern Brazil, 2003-2005.

Domains/facets	$\beta$	t	p
Physical	0.275	5.56	0.000*
Psychological	0.179	3.31	0.001*
Social relationship	0.084	1.83	0.067*
Environmental	0.171	3.57	0.000*
Sensory abilities	0.024	0.58	0.561
Autonomy	-0.062	-1.34	0.100*
Past, present, and future activities	0.097	1.69	0.091*
Social participation	0.118	2.07	0.038*
Death and dying	-0.082	-2.25	0.024*
Intimacy	0.014	0.345	0.730

\*p=0.1; R<sup>2</sup>=51.1%

**Table 5** - Comparison between test and retest facets and overall scores (n=51). Southern Brazil, 2003-2005.

Facets	Test	Mean (SD)	Retest	t	p-value
Sensory abilities	74.39 (25.03)		74.03 (24.61)	0.132	0.89
Autonomy	65.86 (15.87)		62.13 (14.02)	1.95	0.056
Past, present, and future activities	68.26 (17.62)		64.90 (16.93)	1.90	0.062
Social participation	65.65 (19.39)		63.70 (17.76)	0.79	0.43
Death and dying	61.89 (23.87)		66.10 (25.28)	-1.62	0.11
Intimacy	68.01 (21.01)		68.01 (19.51)	0.000	1.0
Overall	67.40 (13.53)		66.21 (12.24)	1.08	0.28

T: Paired t-tests

fact relevant to the quality of life in older adults, and, therefore, are not significant in the regression model. However, their importance has been reinforced in Brazilian and several international focus groups, and there is consistent literature describing they are relevant to and interfere with quality of life of elderly (Farquhar,<sup>11</sup> 1995; Bowling et al,<sup>3</sup> 2002).

The second hypothesis is related to the choice of the dependent variable in the regression model. The utilization of a single quality of life item as the dependent variable may be questioned based on its robustness. Bowling<sup>4</sup> (2005) states that robust items seem to produce reliable measurements, offering several advantages compared to long instruments. Another important fact against this hypothesis is that the WHOQOL-100 overall score and the WHOQOL-BREF generic quality of life item were included in these instruments to allow researchers to assess global quality of life (The WHOQOL Group, 1998). These global items were used to test criterion validity in the field testing of both versions (Fleck et al,<sup>12</sup> 1999; Fleck et al,<sup>13</sup> 2000).

The third hypothesis is based on the characteristics of the sample studied, which is basically composed of community elderly who consider themselves healthy. One could suggest that the two facets not included in the regression model would be relevant if a predominant functionality restricted old adult sample was examined.

The fourth hypothesis, which it is believed to be the most probable one, is the occurrence of confounders or colinearity in the model that may cause decreasing facets impact. Correlations between WHOQOL-BREF domains and WHOQOL-OLD facets proved relatively homogeneous and of mild to moderate intensity (varying from 0.17 to 0.62) (data not shown),

which refute the notion that high correlations could decrease the facets' impact in the model. However, other variables not included in the model could play that role. Depressive symptoms impact in the quality of life, shown in older populations (Xavier et al,<sup>22</sup> 2003) is a relevant potential confounder. This issue will be addressed in another publication.

Along with the findings reported by these authors in another article (Fleck et al,<sup>14</sup> 2003), the present study introduces a methodology for the development of health instruments that proposes the association of a quality approach (item generating) and a quantitative approach (objective measurement of the instrument's performance). Through this association, the subjects to whom the instrument is devised are able to actively participate in the item generation, determining the importance of the items proposed by researchers and evaluating the item formulation (concerning the terms used and understanding of phrasing).

The WHOQOL-OLD module is an additional tool to the WHOQOL-100 or WHOQOL-BREF as a useful alternative in the investigation of quality of life in older adults, including relevant aspects not covered by the instruments originally designed for non-elderly populations.

Since an instrument's validation is a continuous process, further studies for testing the WHOQOL-OLD's performance on older adult populations of different profiles are needed.

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