WHOQOL-BREF psychometric properties in a sample of smokers

Propriedades psicométricas do WHOQOL-BREF em uma amostra de tabagistas

Maria da Graça Castro,[1] **Margareth da Silva Oliveira,**[1]
Alessandra Cecília Miguel,[1] **Renata Brasil Araujo**[1]

Abstract

Objective: To study the World Health Organization Quality of Life Instrument Bref psychometric properties in a sample of smokers. It is a self-administered instrument to evaluate quality of life. It contains 26 questions allocated to 4 domains: Social, Psychological, Physical and Environmental, there are 2 questions related to the Global domain. **Method:** *The sample was formed by 276 tobacco users selected at random. The instruments applied were: World Health Organization Quality of Life Instrument Bref, Fagerström Test for Nicotine Dependence, and Medical Outcomes Study Short-Form 36-item. The statistical analysis was accomplished up by ANOVA, Cronbach's alpha, Pearson's Coefficient and Multiple Regression.* **Results:** *The World Health Organization Quality of Life Instrument Bref presented good reliability (Cronbach's alpha 0.9207), converging validation (0.382 ≤ r ≤ 0.753; p < 0.001), discriminant validation and criterion validation (0.554 ≤ r ≤ 0.778; p < 0.001).* **Conclusion:** *The World Health Organization Quality of Life Instrument Bref proved to be an adequate instrument, with a good level of reliability, being easily and quickly administered.*

Descriptors: Nicotine; Psychology; Quality of life; Tobacco; Measures

Resumo

Objetivo: Estudar, em uma amostra de tabagistas, as propriedades psicométricas do World Health Organization Quality of Life Instrument Bref, que é um instrumento para avaliar a qualidade de vida. É auto-aplicável e possui 26 questões, divididas em quatro domínios: Físico, Psicológico, Social e Ambiental, além de duas questões que formam o domínio Global. **Método:** *A amostra foi composta por 276 dependentes de tabaco da população geral selecionados aleatoriamente. Os instrumentos utilizados foram o World Health Organization Quality of Life Instrument Bref, Fagerström Test for Nicotine Dependence e o Medical Outcomes Study Short-Form 36-item. A análise estatística foi realizada por meio dos testes ANOVA, alpha de Cronbach, Coeficiente de Correlação Linear de Pearson e Regressão Linear Múltipla, método setpwise.* **Resultados:** *O World Health Organization Quality of Life Instrument Bref apresentou uma boa fidedignidade (alpha de Cronbach 0,9207), validade convergente (0,382 ≤ r ≤ 0,753; p < 0,001), validade discriminante e validade de critério (0,554 ≤ r ≤ 0,778; p < 0,001).* **Conclusão:** *O World Health Organization Quality of Life Instrument Bref demonstrou ser um instrumento adequado e de aplicação fácil e rápida para a aferição da qualidade de vida em tabagistas.*

Descritores: Nicotina; Psicologia; Qualidade de vida; Tabaco; Medidas

[1] Pontifícia Universidade Católica do Rio Grande do Sul (PUC-RS), Porto Alegre (RS), Brazil

Programa de Pós-Graduação em Psicologia, Pontifícia Universidade Católica do Rio Grande do Sul (PUC-RS), Porto Alegre (RS), Brazil

Correspondence
Maria da Graça Tanori de Castro
Av. Ipiranga, 6681, Building 11, room 932
90619-900 Porto Alegre, RS, Brazil
Phone: (55 51) 3320-3633 r. 3550 Fax: (55 51) 3320-3633
E-mail: mgdc@uol.com.br and marga@pucrs.br

Introduction

Due to the technological development of medicine during the last few decades, new parameters became necessary to evaluate the impact of a disease and its treatment on patients' life.[1]

One of these measures is the construct "Quality of Life", defined by the World Health Organization (WHO) as the "individuals' perceptions of their position in life, in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns".[2]

There are several instruments to measure the quality of life[3], being some instruments generic and others disease-specific.[1,3] Among the generic instruments there are the Medical Outcomes Study Short-Form 36-Item -SF-36,[4] the World Health Organization Quality of Life Instrument (WHOQOL-100)[5] and its brief version, the World Health Organization Quality of Life Instrument Bref (WHOQOL-BREF).[6] Both WHOQOL instruments belong to the WHO and have been translated into 20 languages.[7] The WHOQOL-BREF is a self-administered questionnaire to evaluate general quality of life and it was validated in Brazil by Fleck et al.[7] It is important to note that the WHOQOL-BREF is a means of measuring general quality of life and that the SF-36 is a health-related quality of life (HRQL) instrument, i.e., it measures the impact of sickness on one's life.[1]

The quality of life construct has been important for studies of different areas as well as for smoking and its associated diseases.[8-11] In Brazil, 32.6% of the population are smokers.[12] Several studies have analyzed the relationship between smoking and the worsening of the quality of life.[8-11] Most of these studies used the SF-36[9-11] scale, and there are no studies that used the WHOQOL-BREF in this population.

In order to use such an instrument it is necessary to evaluate its psychometric properties. These properties can be evaluated, according to Fachel,[13] by means of: reliability (test-retest method, parallel forms method, split-half method and coefficients of internal consistency), content validation (validation of content and face), criterion validation (concurrent validation and predictive validation) and construct validation (convergent, discriminant and factorial validation).

The Brazilian validation of WHOQOL-BREF was accomplished in a sample of 250 clinical and surgical patients (outpatients and inpatients) and 50 controls.[7] The study of the psychometric indexes of the WHOQOL-BREF was performed in different samples,[14-16] but evaluations of these properties in a tobacco-addicted population were not found. The justification to study the psychometric properties of WHOQOL-BREF in a sample of tobacco-addicted subjects without tobacco-related diseases is to verify its sensitivity in this group that constitutes the majority of smokers. Therefore, this is the objective of this study.

Method

1. Subjects

The sample included smokers from the general population of Porto Alegre (RS) assessed by the Snowball Sampling Method.[17] The sample was formed by 276 smokers (169 females and 107 males), aged from 18-60 years (M = 37.39; SD = 11.53).

The inclusion criteria were the following: having tobacco addiction according to the ICD-10 criteria,[18] having attended at least five years of elementary school, aging 18-60 years and having no tobacco-related disease. Those patients addicted to other psychoactive substances were excluded from the study, except for those using caffeine.

Regarding the severity of the tobacco addiction, evaluated by the Fagerström Test for Nicotine Dependence (FTND),[19] the subjects were split as follows: 140 (50.7%) had mild addiction, 93 (33.7%) had moderate addiction and 43 (15.6%) had severe tobacco addiction.

2. Instruments

1) Chart of Socio-Demographic Data: general information about health and evaluation of the use of tobacco and other psychoactive substances.

2) WHOQOL-Bref: World Health Organization Quality of Life Instrument – Bref. It contains 26 questions distributed in four domains: Social (3 questions), Environmental (8 questions), Physical (7 questions) and Psychological (6 questions) and 2 more questions related to the global evaluation of quality of life.[7] The answers are rated on a 5-point Likert scale. Information about the instrument can be found in reference.[20]

3) Fagerström Test for Nicotine Dependence (FTND):[19] It has been widely used to evaluate the severity of the tobacco addiction. It was validated in Brazil.[21] The cutoff points of this instrument are: mild: 0-4, moderate: 5-7, high: 8-10.[22,23]

4) Medical Outcomes Study 36-item Short-Form Health Survey (SF-36): It is a general and multidimensional questionnaire to evaluate the quality of life. It comprises 36 items divided in 8 domains: Physical Aspects, Emotional Aspects, Social Aspects, Functional Capacity, Pain, General Health Status, Mental Health and Vitality.[4] This instrument was validated in Brazil by Cicconelli.[24] It was used in this study to evaluate the convergent validation.

3. Procedures

This study was approved by the Research Ethics Committee of PUCRS (158/05-CEP). The data were collected only after each subject was informed about the procedures and the objectives of this study and after two copies of the Informed Consent were signed. One of the copies was kept by the subject. The administration of the instruments was individual and self-administered.

4. Data analysis

The information collected was organized with the Statistical Package for the Social Sciences (SPSS) software, version 11.5. The exploratory analysis involved descriptive statistical procedures. It was used Cronbach's alpha (to evaluate the reliability), Kolmogorov-Smirnov Test and Levene Test allowed to use Multiple Linear Regression (to evaluate the criterion validation), Analysis of Variance - ANOVA and Tukey's Test. It is also used the effect size by Hopkins to evaluate discriminant analysis and the Pearson's Coefficient of Linear Correlation (to evaluate the Convergent validation).

Results

1. Reliability

The internal consistency of WHOQOL-BREF was adequate (0.940) for all 26 questions. For each domain the values are: Physical (0.871), Psychological (0.858), Social (0.716) and Environmental (0.808). A reliability split-half coefficient of 0.9207 was found.

2. Discriminant validation

Aiming at evaluating the discriminant validation of the WHOQOL-BREF, a comparison, using ANOVA was performed between the means of its domains in the three levels of tobacco

Table 1 – Means of the domains and global questions of WHOQOL-BREF at different levels of tobacco dependence

Domain	Severity Means (SD)			p	Effect size		
	Mild	Moderate	High		Nicotine dependence		
					Mild and moderate	Moderate and high	Mild and high
Psychological	66.72 (18.10)	63.17 (18.30)	54.16 (23.28)	0.001	0.195	0.451	0.646
Physical	72.17 (17.70)	67.52 (17.68)	58.30 (21.77)	< 0.001	0.263	0.484	0.741
Social	68.16 (20.71)	63.88 (21.53)	53.97 (22.58)	0.001	0.222	0.453	0.659
Environmental	59.20 (15.65)	55.04 (15.74)	47.45 (14.43)	< 0.001	0.265	0.495	0.764
Global	63.93 (19.85)	59.27 (19.49)	55.52 (10.10)	0.030	0.239	0.191	0.247

addiction. The means of all domains presented significant differences, which is better explained in Table 1.

3. Convergent validation

The convergent validation of WHOQOL-BREF was performed with SF-36 by means of Pearson's Coefficient of Linear Correlation. All domains of the instrument presented positive correlations, ranging from low to high, with the domains of the SF-36. The results are shown in Table 2.

4. Criterion validation

The criterion validation was evaluated using Multiple Linear Regression between the domains of WHOQOL-BREF regarding the Global domain of quality of life. All the domains of the WHOQOL-BREF were seen in a linear model that explains 60.3% of the variance and participated of the model that explained the Global Domain of quality of life: Physical ($\beta = 0.378$; $p < 0.001$), Psychological ($\beta = 0.138$; $p = 0.047$), Social ($\beta = 0.131$; $p = 0.021$) and Environmental ($\beta = 0.259$; $p < 0.001$). The criterion validation was also evaluated by means of the Pearson's Coefficient of Linear Correlation. All domains presented correlations from moderate to high ($0.554 \leq r \leq 0.778$; $p < 0.001$).

Discussion

The WHOQOL-BREF proved to be an adequate instrument, with a good level of reliability, being easily and quickly administered. The values of Cronbach's alpha, regarding the total scale as well as its domains, were higher than 0.75, except for the Social Domain ($\alpha = 0.716$), which is considered by Bisquerra et al.[25] as a fully adequate internal consistency, and able to predict that the items consistently evaluate the same construct. A similar result was reached in the validation by Fleck et al.[7] and in the study performed by Skevington et al.[26] The reliability was evaluated by the split-half method and showed a good index.

Even though there are no other studies using the same instrument to evaluate the severity of nicotine addiction in the discriminant validation of this instrument, the discriminative capacity of the WHOQOL-BREF was proved in other studies.[7,14,15]

The WHOQOL-BREF presented a good discriminant validation, as assessed by the Tukey's test. The subjects with severe tobacco addiction presented the lowest scores among the three groups. The smokers with moderate and mild addiction had lower scores if compared to those with severe addiction, except for the Global domain in which there were differences just for mild and severe addiction. There were no differences between those subjects with moderate and mild addiction. The effect size by Hopkins was also used for the comparison of the scores of quality of life between the groups. The effect size between mild and moderate nicotine dependents was trivial for Psychological domain and small for the other domains. When the groups with moderate and high nicotine dependence were compared the effect size was trivial for the Global domain and small for the others. Between mild and high nicotine dependence levels the effect size was small for the Global domain and moderate for the others domains.[27]

Of note, we used a sample of smokers without tobacco-related diseases and few individuals at the group of high nicotine-dependence level.

The convergent validation performed through the correlation analysis showed positive correlations from low to high degree with the dimensions evaluated by the SF-36. This finding is in accordance with the findings of Lima et al.[14] The highest correlations of each domain of the WHOQOL-BREF were found between the Psychological and the Mental Health domains, the Physical and the Vitality domains, the Environmental and the Mental Health domains, and the Social and the Social Aspects domains.

We have to take into account the fact that there is no gold standard for quality of life measures, therefore we used these two instruments which evaluate distinct concepts that can be correlated, like other authors have also done.[14,28,29]

The Multiple Linear Regression, stepwise method, was used to verify which factors would be involved in the Global quality of life. All the domains formed the model that best explained the global quality of life. Findings of the literature also are in accordance with this result.[7]

Table 2 – Pearson's Correlation between the domains of SF-36 and WHOQOL-BREF

SF-36 / WHOQOL-BREF	Psychological	Physical	Environmental	Social
Mental health	0.752 (p < 0.001)	0.681 (p < 0.001)	0.573 (p < 0.001)	0.565 (p < 0.001)
Functional capacity	0.468 (p < 0.001)	0.621 (p < 0.001)	0.382 (p < 0.001)	0.382 (p < 0.001)
Physical aspects	0.529 (p < 0.001)	0.646 (p < 0.001)	0.395 (p < 0.001)	0.433 (p < 0.001)
Pain	0.412 (p < 0.001)	0.588 (p < 0.001)	0.369 (p < 0.001)	0.399 (p < 0.001)
General health	0.633 (p < 0.001)	0.733 (p < 0.001)	0.536 (p < 0.001)	0.518 (p < 0.001)
Vitality	0.743 (p < 0.001)	0.753 (p < 0.001)	0.547 (p < 0.001)	0.536 (p < 0.001)
Social aspects	0.723 (p < 0.001)	0.664 (p < 0.001)	0.523 (p < 0.001)	0.590 (p < 0.001)
Emotional aspects	0.547 (p < 0.001)	0.536 (p < 0.001)	0.401 (p < 0.001)	0.444 (p < 0.001)

The criterion validation of the WHOQOL-BREF also proved to be adequate, presenting correlations ranging from moderate to high between all domains, without redundancy among them ($\pi < 0.80$).

Conclusion

This study showed that the psychometric properties of WHOQOL-BREF are adequate, as well as its capacity to evaluate the quality of life in smokers. The Physical, Psychological, Social and Environmental domains are interrelated in the measurement of the quality of life in this population.

It must be highlighted that this study used a sample of smokers without tobacco-related diseases, which might have influenced the results, mainly regarding the Physical domain. The sample was also formed by few subjects who presented severe tobacco addiction. These limitations are the reason why we suggest the accomplishment of new studies involving subjects presenting a higher pattern of tobacco dependence.

We hope that the WHOQOL-BREF might be a useful instrument not only for the researchers, but also for health care professionals who work with nicotine-addicted patients as an auxiliary tool in the evaluation of the quality of life.

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