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## Content validity, construct validity, and reliability of the WHOQOL-Bref in a population of Dutch adult psychiatric outpatients

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### Abstract

In this study, the psychometric properties of a quality of life scale, the WHOQOL-Bref, were examined in a population of 533 Dutch adult psychiatric outpatients. Participants underwent two semistructured interviews in order to obtain Axis-I and II diagnoses, according to DSM-IV. Besides the WHOQOL-Bref they also completed questionnaires for measuring psychopathological symptoms (SCL-90) and perceived social support (PSSS). Scores on 25 of the 26 questions of the WHOQOL-Bref had a good distribution. Similar to previous findings, exploratory factor analysis revealed a four-factor structure. A priori expected associations were found between the domains of the WHOQOL-Bref, on the one hand, and dimensions of the SCL-90 and the PSSS-score, on the other hand, indicating good construct validity. The internal consistency of the four domains of the WHOQOL-Bref ranged from 0.66 to 0.80. Domain scores of the WHOQOL-Bref correlated around 0.92 with the WHOQOL-100 domain scores. Relatively low correlations were found between demographic characteristics (age and sex) and WHOQOL-Bref domain scores. It is concluded that the content validity, construct validity, and the reliability of the WHOQOL-Bref in a population of adult Dutch psychiatric outpatients are good. The WHOQOL-Bref, therefore, is an adequate measure for assessing quality of life at the domain level in a population of adult psychiatric outpatients.

**Key words:** Psychiatric outpatients, Reliability, Validation, WHOQOL-Bref

### Introduction

Quality of Life (QOL) has become an important topic in (psychiatric) medicine, because (i) the accuracy of morbidity and mortality as classical outcome measures of medical interventions has been criticized [1], and (ii) effects of psychiatric disorders on aspects of everyday life have become a field of growing interest in (psychiatric) research [2]. From the 1980s onwards, many instruments have been developed for the assessment of functioning in daily life. Although these instruments

often are labelled as general 'quality of life' measures, strictly speaking, they assess *health-related* quality of life (HRQOL) or health status. In HRQOL research, the aim is to assess *functioning itself* (e.g., with questions like 'Can you work during 8 h?'). In contrast, QOL research focusses on the *personal evaluation of functioning* (e.g., 'Are you satisfied with your working capacity?'). The initial development of generic HRQOL instruments was followed by the development of disease-specific assessment instruments. Today, many instruments are available [3, 4]. HRQOL assess-

ment instruments have been designed predominantly for patients with somatic diseases and, to a lesser extent, patients with psychiatric disorders [2, 5].

Over the past two decades, there has been an ongoing debate regarding the assessment of (HR)QOL. This discussion has resulted in consensus about four principles. First, (HR)QOL should be measured in a *comprehensive* way, covering a broad range of domains and facets [6, 7]. The second principle concerns the importance of *subjective measurement* by self-report questionnaires [6, 8]. A third fundamental principle reflects the conviction that the *relative importance of various facets* of (HR)QOL is a crucial issue for the accuracy of the overall assessment of (HR)QOL [8, 9]. Finally, the instruments for the assessment of (HR)QOL need to be *culturally-sensitive* and should contain questions that address culturally-relevant issues and culturally-relevant language [10–12].

While many existing (HR)QOL measures only address *some* of the four principles mentioned above, the World Health Organization Quality of Life assessment instrument (WHOQOL) meets *all* of them. The WHOQOL is an internationally applicable, cross-culturally comparable, generic, and multidimensional instrument for the assessment of QOL, defined as the ‘individuals’ perception of their position in life within the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns’ [13–15]. The first results of the WHOQOL project have been the development of the WHOQOL-100 [14, 16, 17] and, more recently, the construction of the WHOQOL-Bref [18]. The WHOQOL-100 allows a comprehensive assessment of QOL, but is sometimes in a practical sense too cumbersome, for example, in large epidemiological studies. Therefore, the WHOQOL-Bref was developed to enable a brief, but accurate, assessment of QOL in routine clinical work, large scale epidemiological studies, and clinical trials [18].

The few existing studies with the WHOQOL-100 among patients with psychiatric disorders almost all focus on depression. For instance, Angermeyer et al. [19] investigated the QOL of patients with a depressive disorder using the WHOQOL-100 1, 4, and 7 months after their discharge from hospital.

They found that, compared to patients with persisting depression, the QOL of patients with depression in remission was better. However, the QOL of the latter group still remained slightly worse compared with a random sample of the general population, even seven months after discharge. Bonicatto et al. [20] used the WHOQOL-100 for the assessment of QOL in a sample of ambulatory depressed patients, who met DSM-IV criteria for current major depression. QOL was found to be significantly poorer compared with healthy persons and individuals with chronic somatic pathologies (i.e., lumbalgia due to benign processes, hypertension treated on an outpatient basis, and breast cancer in remission). Skevington and Wright [21] examined changes in QOL in patients with moderate depression who received antidepressant medication. It was concluded that QOL increased significantly in the eight weeks after the start of the antidepressant medication. The WHOQOL-100 showed to be valid and sensitive to changes in this clinical condition. Its psychometric aspects were qualified as good to excellent [21].

Concerning the psychometric properties of the WHOQOL-Bref, studies have shown good internal consistency, excellent discriminant validity [22] and good sensitivity [23]. Until now, research with the WHOQOL-Bref focussed mainly on healthy subjects and patients with *somatic disorders* [e.g., 23–26]. Studies with the WHOQOL-Bref among patients with *psychiatric disorders* are scarce. In the three existing studies, which are all focussed on psychosis, the psychometric qualities of the WHOQOL-Bref were not specifically investigated [27–29].

Research concerning the psychometric properties of the WHOQOL-Bref in general populations of psychiatric outpatients has not been performed systematically. Therefore, the aim of the present study was to examine the content validity, construct validity, and reliability of the WHOQOL-Bref in such a population. Negative correlations were expected between (i) the WHOQOL-Bref domain Physical Health and somatic complaints, and (ii) the WHOQOL-Bref domain Psychological Health and negative emotions. Finally, the WHOQOL-Bref domain Social Relationships was predicted to have a positive correlation with perceived social support.

## Method

### *Patients*

The present study, which constitutes a main part of a larger QOL study, was conducted at GGZ-Midden Brabant, the community mental health center in Tilburg, the Netherlands, after approval by the Medical Ethical Committee of the Southern Netherlands. Participants were outpatients of Dutch ethnic origin, referred to the center in the period from March 1, 2001 till March 1, 2002. Included were people aging 21–50 years. This age criterion was set to match the criteria of the employed questionnaires. Potential participants could enter the study in two ways. They (i) could enter the study through a random selection procedure (i.e., every third referral was directly selected for psychiatric evaluation) or (ii) through internal referral by colleagues (i.e., psychologists asking for psychiatric consultation). Internal referrals were considered in order to enlarge the sample size. After complete description of the study to the participants, written informed consent was obtained. Exclusion criteria were inability to undergo the various verbal and written parts of the investigation protocol (interviews and questionnaires) due to severe mental illness, illiteracy, dyslexia, mental retardation, problems with sight or hearing, cerebral damage, or refusal to participate.

### *Measures*

Participants were asked to complete self-administered questionnaires for measuring QOL, psychopathological symptoms, and perceived social support. In addition, they underwent two semi-structured interviews (held in two separate sessions) for obtaining Axis-I and II diagnoses, according to DSM IV. This thorough diagnostic assessment of the participants, also necessary for other parts of the larger QOL study, was performed in order to provide insight into the composition of the participants regarding their psychopathology.

### *Quality of life*

The WHOQOL-Bref was derived from data collected using the WHOQOL-100, Dutch version [13]. The WHOQOL-Bref is an abbreviated ver-

sion of the WHOQOL-100 quality of life assessment instrument. The WHOQOL-Bref comprises one question from each of the 24 facets in the WHOQOL-100 that belong to one of the domains (Physical Health, Psychological Health, Social Relationships, and Environment), and two questions from the overall quality of life and general health facet [18]. The questions have a 5-point Likert scale. In a previous study, domain scores were found to correlate highly with the WHOQOL-100 domain scores [18].

### *Symptoms*

Actual perceived symptoms were measured with the Symptoms Check List-90 (SCL-90 [30]), Dutch version [31]. The 90-facet SCL is a multidimensional self-report inventory. The questions of the SCL-90 cover a major part of complaints that can be reported by psychiatric outpatients, with a 5-point rating scale ranging from 1, *totally not*, to 5, *very much*. The questions are grouped into dimensions, of which the following eight were used in this study: (1) anxiety, (2) phobic anxiety, (3) depression, (4) somatization, (5) insufficiency of thinking and acting, (6) paranoid ideation and interpersonal sensitivity, (7) hostility, and (8) sleep difficulty. In the Dutch version of the SCL-90, the dimensions Interpersonal sensitivity and Paranoid ideation (and three items from the so-called Psychoticism dimension) are combined due to a lack of sufficient discrimination between these dimensions [31]. Reliability and validity of the Dutch version of the SCL-90 are qualified as good [32].

### *Social support*

The total score of the 12-facet version of the perceived social support scale (PSSS; [33, 34]) was used to assess general perception of social support. The rating scale varied from 1, *very strongly disagree*, to 7, *very strongly agree*. The PSSS has good reliability and validity [33].

### *DSM-IV, Axis-I diagnosis*

For the Axis-I diagnosis, the Schedules for the Clinical Assessment in Neuropsychiatry (SCAN 2.1), were used [35, 36]. The SCAN is a comprehensive semi-structured diagnostic interview, developed under auspices of the WHO, aimed at the assessment and classification of psychiatric

disorders in adults [35–37]. The interviews were administered by two psychiatrists (FJT and EDM) trained and certified at the WHO centre in Groningen, the Netherlands. Most of the studies about the psychometric properties of the SCAN have only examined earlier versions or parts of the current version [38, 39]. Rijnders et al. tested the psychometric properties of the integral SCAN 2.1. Overall reliability was qualified as moderate to substantial and, with regard to the test–retest situation, as fair to moderate. In the standardized situation using videotaped interviews by experts, sensitivity as well as specificity proved to be substantial to almost perfect [40].

#### *DSM-IV, Axis-II diagnosis*

For the Axis-II diagnosis, the structured clinical interview for DSM-IV Axis II personality disorders (SCID-II ; [41] ), 2.0 [42], Dutch version [43], was used. The SCID-II, 2.0 is a semi-structured interview with 140 facets, organized by diagnosis, covering the ten personality disorders included in DSM-IV Axis II and the two personality disorders listed in the DSM-IV Appendix (i.e., diagnoses requiring further study). The instrument provides categorical diagnoses and dimensional scores for each disorder. With regard to the psychometric properties, Maffei et al. investigated the interrater reliability and internal consistency. Interrater reliability was good for categorical diagnoses as well as dimensional diagnoses. Internal consistency for the dimensional scales proved to be satisfactory [44].

#### *Demographical variables*

Patients were asked to report age and sex. These variables were included because of their importance for the operationalization of QOL [45].

#### *Statistical analyses*

Frequencies were employed for calculating the skewness (criteria:  $>-0.50$  or  $<0.50$ ) and kurtosis (criterion: negative sign) of the WHOQOL-Bref questions. Exploratory factor analysis was performed for examining content validity, using a combination of the scree test [46] and interpretability. Content validity was defined as the extent to which a measure assesses all the important aspects of a phenomenon that it claims to measure

[47]. In addition, construct validity, i.e., the extent to which the (domains of the) WHOQOL-Bref actually assesses what it is intended to assess [47], was investigated.

In order to provide information on construct validity, Pearson correlations were calculated between the four domains of the WHOQOL-Bref, on the one hand, and the four domains of the WHOQOL-100, the SCL-90 and the PSSS, on the other hand. A  $p$ -value below 0.01 was considered statistically significant, due to the large sample size. Fisher- $Z$  tests were performed in order to determine if differences between some specific calculated Pearson correlations were statistically significant (at the 0.05 level,  $Z > 1.96$  was considered significant). Reliability refers to the consistency of measures and can be assessed, among others, by calculating internal consistency reliability, that refers to how consistently all the items measure the same construct [47]. As measure of internal consistency, Cronbach's  $\alpha$  were calculated. To determine the relationship between the WHOQOL-Bref and sex, Student  $t$ -tests were used. The relationship between WHOQOL-Bref and age was examined using Pearson correlations. The data were processed using the Statistical Package for the Social Sciences (SPSS, version 10.0 for Windows).

## **Results**

### *Patients*

During the one year period, 3892 people (male: 40.4%) were referred to the outpatient clinic of the center. Taking the inclusion and exclusion criteria into account, about half of them ( $n = 1559$ ) were potential participants (male: 42.2%). The total group that entered the study contained 533 participants (male: 46.2%); 438 participants (82.2%) entered the study through random selection (male: 42.7%), and 95 through internal referral (male: 62.1%). From the 438 randomly selected participants, 20 were unable to undergo the research protocol, due to severe psychotic disorder ( $n = 7$ ), major depressive episode ( $n = 9$ ), dyslexia ( $n = 2$ ), mental retardation ( $n = 2$ ), and eight refused to participate (four diagnosed with antisocial personality disorder; 4 with substance related disorder).

der). From the 95 internally referred participants, six were unable to undergo the research protocol, due to severe psychotic disorder ( $n = 1$ ), substance related disorder ( $n = 2$ ), mental retardation ( $n = 1$ ), and a severe visual handicap ( $n = 2$ ). From this group, four people refused to participate (all diagnosed with antisocial personality disorder). Thus, from the total group of 533 participants, 495 fully completed the test booklet (92.9%; 410 randomly selected and 85 by internal referral; 44.2% male, mean age 34.6 years,  $SD = 8.6$ , range 21–50 years; 55.8% female, mean age 32.6 years,  $SD = 8.5$ , range 21–50 years). For these 495 participants, Axis I and II diagnoses according to DSM IV were determined. Of the participants, 42 did not meet criteria for a diagnosis according to DSM IV on either Axis I and II. The diagnoses are presented in Table 1.

#### Content validity

##### Skewness and kurtosis

For each WHOQOL-Bref question, the skewness and kurtosis were calculated. One question was excluded from further analyses because of values deviating too much from prevailing skewness or kurtosis criteria: 'How healthy is your environment?' (skewness  $-0.20$ ; kurtosis  $0.75$ ). Further

psychometric analyses were performed with the remaining 25 questions (including two questions concerning overall QOL and general health, i.e., the general evaluative questions).

##### Exploratory factor analysis

A principal components analysis (PCA) with varimax rotation was carried out on 23 questions, excluding the two general evaluative questions. The scree plot [46] indicated four factors: physical health (I), psychological health (II), social relationships (III), and environment (IV). This four-factor solution closely resembled earlier findings with the WHOQOL-Bref [18]. The PCA results are presented in Table 2.

##### Construct validity

The SCL-90 and the PSSS scores were correlated with the general evaluative facet and the four domains of the WHOQOL-Bref. The results are presented in Table 3.

As can be seen in Table 3, the general evaluative facet and all domains of the WHOQOL-Bref were statistically significantly correlated with all SCL-90 dimensions and the PSSS score. In accordance with our expectations, the SCL-90 subscales generally correlated higher with the WHOQOL-Bref

**Table 1.** Axis I and axis II diagnosis according to DSM-IV classification ( $n = 495$ )

Axis I diagnosis	N <sup>a</sup>	Axis II diagnosis	N <sup>a</sup>
Pervasive developmental disorder	5	Paranoid personality disorder	5
ADDB disorder <sup>b</sup>	6	Schizoid personality disorder	11
Substance related disorder	38	Schizotypal personality disorder	3
Psychotic disorder	7	Antisocial personality disorder	27
Mood disorder	127	Borderline personality disorder	71
Anxiety disorder	82	Histrionic personality disorder	8
Somatoform disorder	10	Narcissistic personality disorder	22
Sexual disorder/gender identity disorder	10	Avoidant personality disorder	49
Eating disorder	17	Dependent personality disorder	26
Impulse-control disorder	6	Obsessive-compulsive personality disorder	24
Adjustment disorder	44	Personality disorder not otherwise specified	70
Other disorder	12	Postponed diagnosis	15
Other conditions <sup>c</sup>	78	No diagnosis <sup>d</sup>	227
No diagnosis <sup>d</sup>	113		

<sup>a</sup> The figures represent amounts of recorded diagnoses. Due to the phenomenon of comorbidity (i.e., the classification of more than one diagnosis on Axis I or II) the totals of recorded diagnoses per Axis exceed the total number of participants.

<sup>b</sup> ADDB disorder, attention-deficit and disruptive behaviour disorder.

<sup>c</sup> Other conditions: these conditions are classified in DSM-IV as conditions that may be a focus of clinical attention (so-called V-codes).

<sup>d</sup> The majority of participants with no diagnosis on Axis I had a diagnosis on Axis II and vice versa. A total of 42 participants did not meet criteria for a diagnosis according to DSM IV on either Axis I and II.

**Table 2.** Factor loadings from the rotated factor structure (principal component analysis with varimax rotation)

WHOQOL-Bref facets	Component			
	I	II	III	IV
Working capacity	<b>0.69</b>	0.34		
Pain and discomfort	<b>0.68</b>			
Activities of daily living	<b>0.67</b>	0.34		
Dependence on medication and treatments	<b>0.66</b>			
Energy and fatigue	<b>0.64</b>	0.40		
Sleep and rest	<b>0.40</b>	0.34		
Mobility	<b>0.37</b>			0.51
Self esteem		<b>0.72</b>		
Positive feelings		<b>0.72</b>		
Spirituality/religion/personal beliefs		<b>0.67</b>		
Body image and appearance		<b>0.46</b>		
Thinking, learning, memory, and concentration	0.44	<b>0.45</b>		
Negative feelings	0.43	<b>0.45</b>		
Physical safety and security		0.30		<b>0.27</b>
Personal relationships		0.32	<b>0.74</b>	
Social support			<b>0.68</b>	
Sexual activity			<b>0.62</b>	
Health and social care, availability and quality	0.39		0.47	<b>0.33</b>
Financial resources				<b>0.77</b>
Opportunities for acquiring new information and skills			0.32	<b>0.63</b>
Participation in, and opportunities for recreation		0.27		<b>0.63</b>
Transport				<b>0.56</b>
Home environment			0.31	<b>0.47</b>

<sup>a</sup> Only factor loadings > 0.26 are presented.

<sup>b</sup> Facets belonging to each of the four domains/factors are in bold.

<sup>c</sup> I = physical health; II = psychological health; III = social relationships; IV = environment.

domains physical health (average correlation = -0.49) and psychological health (average correlation = -0.44) than with the domains social relationships (average correlation = -0.21) and environment (average correlation = -0.35).

As expected, the correlation of the SCL-90 dimension somatization with the WHOQOL-Bref domain physical health, was significantly stronger than the correlations of this SCL-90 dimension with the WHOQOL-Bref domains psychological

**Table 3.** Construct validity (n = 495)

WHOQOL-Bref	SCL-90								PSSS
	Anx	Ago	Dep	Som	In	Sens	Hos	Sleep	
Overall quality of life and general health	-0.42	-0.32	-0.51	-0.47	-0.45	-0.39	-0.26	-0.40	0.31
<i>Physical health</i>	-0.49	-0.40	-0.55	<b>-0.59</b>	-0.56	-0.42	-0.32	-0.56	0.22
<i>Psychological health</i>	-0.42	-0.31	<b>-0.62</b>	-0.41	-0.52	-0.52	-0.36	-0.39	0.31
<i>Social relationships</i>	-0.19	-0.16	-0.31	-0.14	-0.24	-0.33	-0.13	-0.15	<b>0.56</b>
<i>Environment</i>	-0.33	-0.26	-0.43	-0.34	-0.40	-0.39	-0.33	-0.31	0.30

<sup>a</sup> All correlations are significant at the 0.01 level (2-tailed).

<sup>b</sup> Anx = anxiety; Ago = phobic anxiety; Dep = depression; Som = somatization; In = insufficiency of thinking and acting; Sens = paranoid ideation and interpersonal sensitivity; Hos = hostility; Sleep = sleep difficulty.

<sup>c</sup> Domains are presented in italics, strong correlations in bold.

health ( $Z = 3.41$ ), social relationships ( $Z = 9.96$ ) and environment ( $Z = 5.22$ ).

Regarding the correlations of the SCL-90 dimension depression with the different WHOQOL-Bref domains, the correlation with the domain psychological health was significantly stronger than those with the domains social relationships ( $Z = 7.02$ ) and environment ( $Z = 3.93$ ). No significant difference was found between the correlations of the SCL-90 dimension depression with the WHOQOL-Bref domains psychological health and physical health ( $Z = 0.41$ ).

Finally, in accordance with expectations, the domain social relationships had the strongest correlation with the PSSS score (the difference between this correlation and second strongest, i.e., the correlation with the SCL-90 dimension paranoid ideation and interpersonal sensitivity, was significant:  $Z = 4.48$ ). Moreover, the PSSS score was significantly stronger correlated with WHOQOL-Bref domain social relationships than with the domains physical health ( $Z = 7.12$ ), psychological health ( $Z = 4.97$ ) and environment ( $Z = 5.22$ ).

#### Reliability

As a measure for the internal consistency of the WHOQOL-Bref, Cronbach's  $\alpha$  were calculated for the domains. The internal consistency of the domains was satisfactory to good, with an alpha of 0.80 for the domain physical health, 0.74 for psychological health, 0.66 for social relationships, and 0.73 for environment.

#### Correlations between WHOQOL-Bref and WHOQOL-100

Correlations between the domain scores of the WHOQOL-Bref and the WHOQOL-100 were calculated. As was expected, the scores of the

WHOQOL-Bref correlated high with the domain scores of the WHOQOL-100. The strongest correlations were found between the corresponding domains of the WHOQOL-Bref and the WHOQOL-100, and are presented in Table 4.

#### Demographics

##### Age

Significant correlations between age and WHOQOL-Bref scores were sparse and relatively low. Age had negative correlations with the domain social relationships ( $r = -0.13$ ;  $p < 0.01$ ) and the general evaluative facet ( $r = -0.14$ ;  $p < 0.01$ ). Regarding the negative correlations found between the domain social relationships with both age and perceived social support, one could expect age also to be negatively correlated with the PSSS score. This indeed was the case ( $r = -0.26$ ;  $p < 0.01$ ).

##### Sex

Regarding the variable sex, only one significant difference was found in QOL scores: females scored higher on the domain social relationships ( $F = 1.004$ ,  $df = 493$ ,  $p < 0.01$ ) than males.

#### Discussion

The aim of the present study was to examine the psychometric properties of the WHOQOL-Bref in a general population of adult psychiatric outpatients. The vast majority of these outpatients met the criteria for a diagnosis according to DSM IV on Axis I and/or Axis II. Although having psychiatric symptoms, 42 participants did not satisfy the requirements for such a diagnosis.

With regard to content validity, the question concerning physical environment was excluded on the basis of frequency distribution problems. The

**Table 4.** Correlations between domains from the WHOQOL-100 and the WHOQOL-Bref

	Domain I 100	Domain II 100	Domain III 100	Domain IV 100
Domain I Bref	<b>0.96</b>	0.61	0.35	0.55
Domain II Bref	0.61	<b>0.93</b>	0.49	0.57
Domain III Bref	0.24	0.39	<b>0.89</b>	0.43
Domain IV Bref	0.52	0.47	0.44	<b>0.88</b>

\*Strongest correlations are presented in bold.



vast majority of the outpatients were very satisfied with their physical environment. Looking at the region the participants lived in, i.e., the city of Tilburg and its surroundings, it can be said that the local environmental circumstances and infrastructural organization of the region are, generally spoken, good. The relative unilateral answering pattern on the question concerning this subject seems to be in accordance with these circumstances.

Exploratory factor analysis revealed the existence of a four-factor structure, which was found earlier for the WHOQOL-100 [1] and, after testing, was also confirmed for the WHOQOL-Bref [18]. Only the questions referring to mobility, physical safety, and health and social care, deviated from these earlier findings [1, 18]. These differences can be explained by the use of a confirmatory factor analysis in the earlier studies. However, the substantial cross-loadings of these three questions with other domains, can also be explained by the formulation of the chosen WHOQOL-100 questions, used in the WHOQOL-Bref. For example, the question regarding mobility (i.e., 'How good can you transport yourself?') can be interpreted as ones physical ability to move (thus loading on domain physical health), as well as ones availability to means of transportation (thus loading on domain environment). Because of these high cross-loadings and the good internal consistency of the four factors, it was decided to use the same factor-structure as described by the WHOQOL Group [18]. The finding that a four-factor structure is not only present in a general population but also in a population of psychiatric outpatients demonstrates that the WHOQOL-Bref truly is a *generic* instrument. On the basis of these results, it can be concluded that the content validity of the WHOQOL-Bref is good.

We expected that QOL would decrease in relation to (i) an increase of (a broad spectrum of) psychiatric symptoms, especially those caused by depression, (ii) an increase of (a broad spectrum of) somatic complaints, and (iii) a decrease of perceived social support. The associations that were found between the WHOQOL-Bref, the SCL-90 and the PSSS, confirm these hypotheses. Regarding the SCL-90 dimension depression, the highest correlation was indeed found with the domain psychological health. The finding that the difference between this correlation and that with

the domain physical health was not significant, can be explained by the fact that psychological as well as physical (vital) signs of depression often are present (e.g., in a major depressive disorder). Other correlations also support the presence of good construct validity. Amongst these are the high negative correlations between SCL-90 dimensions somatization and sleep, and the WHOQOL-Bref domain physical health. The PSSS-score had a high and positive correlation with the WHOQOL-Bref domain social relationships. These findings provided empirical support for the construct validity of the WHOQOL-Bref, which, on this basis, is qualified as good. In accordance with previous research [18], in the present study domain scores produced by the WHOQOL-Bref correlated highly with the WHOQOL-100 domain scores.

Regarding associations between age (range 21–50 years) and QOL, the following picture emerged. The older one gets, the less satisfied one is with its general QOL, physical health and social relationships. With regard to sex and QOL, female participants scored significantly higher than male participants on the domain Social Relationships. These findings support the face validity of the WHOQOL-Bref.

The findings of the present study are consistent with previous studies. According to findings obtained during the developmental process of the WHOQOL-Bref [18], Cronbach's  $\alpha$  were 0.82 for physical health, 0.75 for psychological health, 0.66 for social relationships, and 0.80 for environment. Discriminant validity, content validity, and test-retest reliability were described as good. The field test of the Australian WHOQOL-Bref revealed that Cronbach's  $\alpha$  for the whole research population ranged from 0.68 to 0.87 and for participants with depression from 0.60 to 0.83 [22]. Test-retest reliability was qualified as excellent, and psychometric qualities as good. In a validation study of the Danish WHOQOL-Bref, Cronbach's coefficient  $\alpha$  for the total study population ranged from 0.67 to 0.85. Test-retest reliability was acceptable and it was concluded that the WHOQOL-Bref could be regarded as a valid and generic QOL scale from a psychometric point of view [48]. Validation of the Korean version resulted in the conclusion that the WHOQOL-Bref was reliable and valid. Coefficient  $\alpha$  were found ranging from 0.58 to 0.90 [49].

The results of the present study add to this body of evidence and demonstrate that the WHOQOL-Bref has good reliability and validity in a population of psychiatric outpatients.

The increasing emphasis on program and economic evaluation demands a feasible and useful instrument for assessing QOL. The WHOQOL-Bref can be used to assess QOL in an accurate and brief way in a variety of situations and population groups. This, for instance, could be the case in assessing the effectiveness and relative merits of different treatments of psychiatric patients, in health services evaluation, in research regarding psychiatric patients involving repeated measures designs, clinical (psychopharmacological) trials, or large epidemiological surveys, and in situations where psychiatric patients may have difficulties in completing the of the WHOQOL-100, i.e., the long version. Moreover, the relationship and the interaction between the doctor and the psychiatric patient may improve, as the psychiatrist's understanding of how the psychiatric disease affects the patient's QOL increases.

Up till now, studies with the WHOQOL-Bref among patients with psychiatric disorders were scarce, all focussed on psychosis, and did not specifically investigate the psychometric qualities of the WHOQOL-Bref [27–29]. The present study provided support for using the WHOQOL-Bref in psychiatric patients. The questionnaire appeared to have good reliability, content validity and construct validity and, therefore, is an adequate instrument for assessing QOL in adult psychiatric outpatients.

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