

## Application of WHOQOL-BREF in Measuring Quality of Life in Health-Care Staff

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### ABSTRACT

**Background:** The objective of this study was to evaluate the quality of life of Neyshabur health-care staff and some factors associated with it with use of WHOQOL-BREF scale.

**Methods:** This cross-sectional study was conducted on 522 staff of Neyshabur health-care centers from May to July 2011. Cronbach's alpha coefficient was applied to examine the internal consistency of WHOQOL-BREF scale; Pearson's correlation coefficient was used to determine the level of agreement between different domains of WHOQOL-BREF. Paired *t*-test was used to compare difference between score means of different domains. T-independent test was performed for group analysis and Multiple Linear Regression was used to control confounding effects.

**Results:** In this study, a good internal consistency ( $\alpha = 0.925$ ) for WHOQOL-BREF and its four domains was observed. The highest and the lowest mean scores of WHOQOL-BREF domains was found for physical health domain (Mean = 15.26) and environmental health domain (Mean = 13.09) respectively. Backward multiple linear regression revealed that existence chronic disease in staff was significantly associated with four domains of WHOQOL-BREF, education years was associated with two domains (Psychological and Environmental) and sex was associated with psychological domain ( $P < 0.05$ ).

**Conclusions:** The findings from this study confirm that the WHOQOL-BREF questionnaire is a reliable instrument to measure quality of life in health-care staff. From the data, it appears that Neyshabur health-care staff has WHOQOL-BREF scores that might be considered to indicate a relatively moderate quality of life.

**Keywords:** Health-care staff, neyshabur, quality of life, WHOQOL-BREF

### INTRODUCTION

In recent years there has been a broadening in focus in the measurement of health beyond traditional health indicators such as mortality and morbidity, and quality of life (QOL) has turned into an important outcome in clinical and interventional

studies.<sup>[1]</sup> Different definitions of QOL have been proposed by different researchers or Organizations. The World Health Organization (WHO) has defined “QOL” as “an individual’s perception 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”.<sup>[2]</sup> Recently, many general instruments have been used to measure QOL in different groups (e.g., patients, workers, population and so on). One of these instruments is the World Health Organization QOL-BREF (WHOQOL-BREF) questionnaire which captures many subjective aspects of QOL.<sup>[3-5]</sup> This questionnaire is one of the best known instruments that has been developed for cross-cultural comparisons of QOL and is available in many languages.<sup>[6]</sup> This instrument, by focusing on individuals’ own views of their well-being, provides a new perspective on life. The WHOQOL-BREF questionnaire has translated into Persian and then validated in Iran by Dr. Nedjat and co-workers.<sup>[7]</sup> Most studies were performed to evaluate quality of life in patients’ people,<sup>[8-34]</sup> but there are few studies that evaluated quality of life of health-care staff, which provide services for patients. Health-care staff provides higher quality services for their customers when they are healthy and have good quality of life. The objective of this study was to evaluate the quality of life of Neyshabur health-care staff and some factors associated with it with use of WHOQOL-BREF scale.

## METHODS

This was designed as a cross-sectional study. The data were collected between May and July 2011, at the health centers in the city of Neyshabur (A city in Northeastern of Iran). Of all Neyshabur health-centers staff ( $n = 583$ ), forty eight persons exclude from study because of disagreement of them. All participating subjects provided informed consent after being acquainted with the purpose of study.

### Procedure and study instrument

In this study, questionnaires have been filled by participants and for enhance accuracy; all participants were informed that their responses would remain confidential. A trained person was present to explain how to complete the

questionnaires. We used the brief version of the WHO’s QOL scale (WHOQOL-BREF) in this study. This instrument derived from the WHOQOL-100. The WHOQOL-BREF questionnaire contains two items from the Overall QOL and General Health and 24 items of satisfaction that divided into four domains: Physical health with 7 items (DOM1), psychological health with 6 items (DOM2), social relationships with 3 items (DOM3) and environmental health with 8 items (DOM4). Five hundred and thirty five of Neyshabur health-care staff filled out the Iranian version of the WHOQOL-BREF questionnaire. Each item is rated on a 5-point Likert scale. Each item of the WHOQOL-BREF is scored from 1 to 5 on a response scale. Raw domain scores for the WHOQOL were transformed to a 4-20 score according to guidelines.<sup>[6]</sup> Domain scores are scaled in a positive direction (i.e., higher scores denote higher QOL). The mean score of items within each domain is used to calculate the domain score. After computed the scores, they transformed linearly to a 0-100-scale.<sup>[35,36]</sup>

### Dependent and independent variables

Four domains of WHOQOL-BREF questionnaire were considered as dependent variables. The other data collected were included sex, age, education years, marital status, employment type, income level (per month), job background, chronic disease existence and local residence as independent variables. The age of participants was represented by two categories of  $\leq 35$  year and  $> 35$  year. Education years was categorized into two groups: 0-12 year and  $> 12$  year. Marital status was categorized into two categories including single/divorced and married. Employment type was categorized into two categories including official and contractual. Income level was divided into two categories including  $\leq 5$  million rial and  $> 5$  million rial per month. Job background was divided into two categories including  $< 10$  year and year  $\geq 10$  year. chronic disease existence was categorized into two categories including yes and no. Local residence was categorized into two categories including urban and rural.

### Statistical analyses

The information collected was organized with

the SPSS software, version 16. Descriptive analyses performed including frequencies, percentages, ranges, means, and standard deviations (SD). Cronbach's alpha (internal consistency index) was used to estimate the reliability of the WHOQOL-BREF (Cronbach's alpha values of 0.70 and over were deemed acceptable).<sup>[37]</sup> Pearson's correlation coefficient was used to determine the level of agreement between four domains of WHOQOL-BREF. Paired *t*-test was used to compare difference between score means of different domains of WHOQOL-BREF. To investigate the association between participants' characteristics and their QOL, *t*-independent test was used. At the end Multiple Linear Regression (with backward method) was performed to control confounding effects. Transformed scores were used for statistical analyses in four domains. In this study, the level of significance was set at  $P < 0.05$  for all analyses.

## RESULTS

In total, 535 individuals filled out the WHOQOL-BREF questionnaire in this study. Thirteen questionnaires had more than 20% missing data and thus were excluded from the study. The analysis was restricted for the remaining 522 respondents. The characteristics of study population are shown in Table 1. The mean age of study population was  $35.1 \pm 7.7$  year (Range: 21-65 yr). Of all participants who completed WHOQOL-BREF questionnaire 318 persons (60.9%) were female, with a mean age of  $33.38 \pm 6.77$  and 204 persons (39.1%) were male with a mean age of  $37.76 \pm 8.29$ . There was a significant difference between them in terms of age ( $P < 0.001$ ). Table 2 depicts the missing, floor and ceiling effects for each item. The percentage of respondents scoring at the lowest level (floor effect) ranged from 1 to 16.3 while the percentage of respondents scoring at the highest level (ceiling effect) ranged from 2.9 to 38.5. In this study Cronbach's alpha coefficient was applied to examine the internal consistency of WHOQOL-BREF scale (26 items) as well as the four domains of it. The Cronbach's alpha coefficient of WHOQOL-BREF was adequate (0.925) for all 26 questions and for each domain the values are: Physical health domain (0.813), Psychological health domain (0.811), Social relationship domain (0.65) and Environmental health domain (0.772).

Table 3 present correlations between four domains of WHOQOL-BREF; as observed, there are statistically significant correlations between all domains. There is also statistically significant correlation between overall QOL (Q1) and scores obtained from different domains. In this study in order to compare the significant difference between score means of different domain ratings, the paired *t*-tests were used. As Table 4 shows, significant differences were found between all four different domains of WHOQOL-BREF. As seen in Table 5 and Figure 1, among the different domains, the highest and the lowest mean and percentage of satisfaction were found for DOM1 (Mean = 15.26; percentage = 70.49) and DOM4 (Mean = 13.09; percentage = 56.94) respectively. The mean score of four domains and total of WHOQOL-BREF according to sex, age, education years, marital status, employment type, income level, job background, chronic disease existence and local residence separately are presented in Table 5.

**Table 1:** Characteristics of study population ( $n=522$ )

Characteristics	<i>n</i>	%
Sex		
Male	204	39.1
Female	318	60.9
Age (year)		
$\leq 35$	294	56.3
$> 35$	228	43.7
Education years		
0-12	268	51.3
$> 12$	254	48.7
Marital status		
Single/divorced	62	11.9
Married	460	88.1
Employment type		
Official	216	41.4
Contractual	306	58.6
Income level (per month)		
$\leq 5$ million rial	295	56.5
$> 5$ million rial	227	43.5
Job background (year)		
$< 10$	274	52.5
$\geq 10$	248	47.5
chronic disease		
No	382	73.2
Yes	140	26.8
Local residence		
Urban	383	73.4
Rural	139	26.6

**Table 2:** Response pattern and missing items for each item (*n*=522)

Items (items numbers)	Missing <i>n</i> (%)	Mean score	SDs	Floor <i>n</i> (%)	Ceiling <i>n</i> (%)
Overall QOL (1)	0 (0)	3.65	0.78	9 (1.7)	53 (10.2)
Overall health (2)	0 (0)	3.66	0.96	22 (4.2)	72 (13.8)
Pain (3)	0 (0)	3.72	1.07	17 (3.3)	144 (27.6)
Dependence of medical aids (4)	0 (0)	3.97	1.06	18 (3.4)	201 (38.5)
Positive feeling (5)	0 (0)	3.3	0.97	22 (4.2)	60 (11.5)
Personal belief (6)	0 (0)	3.51	0.97	15 (2.9)	79 (15.1)
Concentration (7)	0 (0)	3.37	0.83	6 (1.1)	42 (8)
Security (8)	0 (0)	3.54	0.93	13 (2.5)	82 (15.7)
Physical environment (9)	0 (0)	3.46	0.95	14 (2.7)	71 (13.6)
Energy (10)	0 (0)	3.38	0.89	9 (1.7)	53 (10.2)
Bodily image (11)	0 (0)	3.65	0.94	8 (1.5)	100 (19.2)
Financial support (12)	0 (0)	2.89	0.95	46 (8.8)	26 (5)
Accessibility of information (13)	0 (0)	3	0.78	12 (2.3)	16 (3.1)
Leisure activity (14)	0 (0)	2.44	0.96	85 (16.3)	15 (2.9)
Mobility (15)	0 (0)	3.51	0.88	12 (2.3)	54 (10.3)
Sleep and rest (16)	0 (0)	3.62	0.98	18 (3.4)	73 (14)
Activities of daily living (17)	0 (0)	3.68	0.80	5 (1)	52 (10)
Work capacity (18)	0 (0)	3.65	0.85	10 (1.9)	65 (12.5)
Self-esteem (19)	0 (0)	3.69	0.83	8 (1.5)	65 (12.5)
Personal relationship (20)	2 (0.38)	3.77	0.82	5 (1)	83 (15.9)
Sexual activity (21)	62 (11.88)	3.52	0.98	21 (4)	56 (10.7)
Social support (22)	0 (0)	3.34	0.91	19 (3.6)	36 (6.9)
Home environment (23)	0 (0)	3.51	0.97	21 (4)	60 (11.5)
Health care (24)	0 (0)	3.61	0.92	14 (2.7)	66 (12.6)
Transport (25)	0 (0)	3.23	1.13	54 (10.3)	50 (9.6)
Negative feeling (26)	0 (0)	3.03	0.97	36 (6.9)	34 (6.5)

QOL=Quality of life, SD=Standard deviations

**Table 3:** Correlation coefficients in two overall questions and four domains of WHOQOL-BREF

	Q1	Q2	DOM1	DOM2	DOM3	DOM4
Q1						
Correlation coefficient	1	0.445	0.290	0.649	0.421	0.523
Sig. (2-tailed)		<0.001	<0.001	<0.001	<0.001	<0.001
Q2						
Correlation coefficient		1	0.359	0.562	0.4	0.493
Sig. (2-tailed)			<0.001	<0.001	<0.001	<0.001
DOM1						
Correlation coefficient			1	0.443	0.413	0.418
Sig. (2-tailed)				<0.001	<0.001	<0.001
DOM2						
Correlation coefficient				1	0.65	0.643
Sig. (2-tailed)					<0.001	<0.001
DOM3						
Correlation coefficient					1	0.566
Sig. (2-tailed)						<0.001
DOM4						
Correlation coefficient						1
Sig. (2-tailed)						

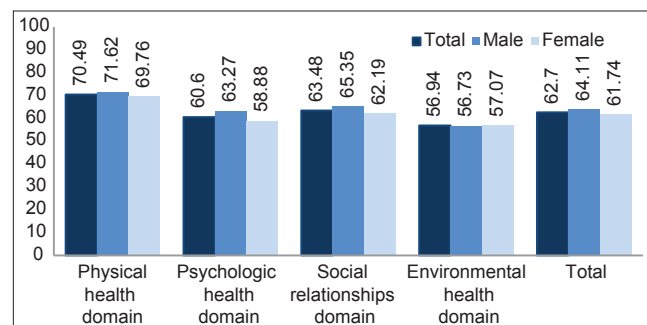
**Table 4:** Paired *t*-test for the four domains of WHOQOL-BREF

	Paired differences				<i>t</i> -test	df	Sig. (2-tailed)
	Mean	Std. deviation	95% CI of the difference				
			Lower	Upper			
Pair 1							
DOM1-DOM2	1.58	2.84	1.34	1.83	12.72	521	<0.001
Pair 2							
DOM1-DOM3	1.063	3.01	0.79	1.34	7.57	459	<0.001
Pair 3							
DOM1-DOM4	2.17	2.77	1.93	2.41	17.89	521	<0.001
Pair 4							
DOM2-DOM3	-0.47	2.28	-0.67	-0.26	-4.37	459	<0.001
Pair 5							
DOM2-DOM4	0.59	2.13	0.41	0.78	6.35	521	<0.001
Pair 6							
DOM3-DOM4	1.12	2.44	0.9	1.34	9.86	459	<0.001

Mean and percentage of satisfaction rating in DOM1, DOM2 and DOM3 was higher in males than females but this is reversed in the DOM4 [Table 5 and Figure 1]. As Table 5 shows, there were significant differences between different states of some variables in four domains and total of WHOQOL ( $P < 0.05$ ). Table 6 illustrates the results of Backward Multiple Linear Regression, it is apparent that “existence chronic disease” and “education years” are significantly associated with total WHOQOL. “Existence chronic disease” is associated with four domains of WHOQOL, “education years” associated with DOM2 and DOM4, sex associated with DOM2. In the DOM1, the confounder was employment type; in the DOM2 and DOM3, age, employment type and job background were recognized as confounders and in DOM4, employment type, income level and local residence were confounders.

## DISCUSSION

One of the major objective of this study was to evaluate the reliability (internal consistency) of WHOQOL-BREF questionnaire in health-care staff. Reliability analysis in this study indicated an acceptable internal consistency of WHOQOL-BREF scale ( $\alpha = 0.925$ ) and for each of its domains were high, except for social relationships domain that is partly low ( $\alpha = 0.65$ ) which is similar to Asnani ( $\alpha=0.66$ ), Skevington ( $\alpha = 0.68$ ) and Mazaheri ( $\alpha = 0.62$ ) studies.<sup>[38-40]</sup> Lower internal consistency can be



**Figure 1:** Comparison transformed scores (0-100-scale) of the WHOQOL-BREF in four domains according to sex

attributed to the small number of questions (3 items) in social relationships domain. Other purpose of this study was to evaluate the QOL of Neyshabur health-care staff with use of the Iranian version of the WHOQOL-BREF questionnaire. To our knowledge, this is one of the first studies assessing QOL among the health-care centers staff in Iran.

QOL as a measurement can identify groups with physical or mental health problems and provide a guide to intervention and follow up evaluation.<sup>[41]</sup> In this study, among the four domains of WHOQOL-BREF, the highest mean satisfaction rating was found for DOM1 (physical health, Mean = 15.26), implying good activities of daily living, less dependence on medicinal substances and medical aids, enough energy and mobility, less pain and discomfort, sufficient sleep and rest and good work capacity. Moreover, the lowest mean score was shown for DOM4 (environmental

**Table 5:** Comparison of the WHOQOL-BREF mean scores in four domains according to sex, age, education years, marital status, employment type, income level, job background, chronic disease existence and local residence

	Domains				
	Physical health Mean±SD	Psychological health Mean±SD	Social relationships* Mean±SD	Environmental health Mean±SD	Total Mean±SD
Total	15.26±2.74	13.68±2.64	14.15±2.8	13.09±2.37	14.02±2.12
Sex					
Male	15.44±2.5	14.11±2.68	14.44±2.7	13.06±2.36	14.24±2.04
Female	15.14±2.88	13.41±2.58	13.95±2.85	13.11±2.38	13.86±2.17
<i>P</i> value	0.228	0.003	0.066	0.821	0.62
Age (year)					
≤35	15.38±2.51	13.95±2.64	14.44±2.85	13.23±2.41	14.26±2.11
>35	15.11±3.01	13.33±2.61	13.83±2.71	12.91±2.31	13.75±2.11
<i>P</i> value	0.266	0.008	0.019	0.126	0.011
Education years					
0-12	15.08±3.078	13.34±2.86	14.02±2.93	12.66±2.5	13.76±2.28
>12	15.45±2.32	14.04±2.34	14.31±2.63	13.54±2.14	14.33±1.88
<i>P</i> value	0.127	0.003	0.264	<0.001	0.004
Marital status					
Single/divorced	15.63±2.59	13.66±2.59	-	13.53±2.41	-
Married	15.21±2.76	13.68±2.65	13.15±2.8	13.03±2.36	14.02±2.12
<i>P</i> value	0.26	0.952	-	0.116	-
Employment type					
Official	14.94±3.18	13.11±2.57	13.73±2.81	12.75±2.36	13.63±2.16
Contractual	15.49±2.37	14.08±2.62	14.49±2.75	13.33±2.35	14.34±2.04
<i>P</i> value	0.03	<0.001	0.004	0.006	<0.001
Income level (per month)					
≤5 Million rial	15.14±2.87	13.56±2.76	14.09±2.97	12.91±2.38	13.88±2.24
>5 Million rial	15.42±2.56	13.84±2.47	14.22±2.58	13.33±2.4	14.19±1.97
<i>P</i> value	0.236	0.234	0.623	0.044	0.126
Job background (year)					
<10	15.48±2.44	14.03±2.65	14.57±2.85	13.24±2.46	14.32±2.13
≥10	15.02±3.02	13.29±2.57	13.76±2.7	12.92±2.26	13.74±2.08
<i>P</i> value	0.059	0.001	0.002	0.113	0.003
Chronic disease					
No	15.73±2.3	14.16±2.5	14.65±2.48	13.43±2.3	14.50±1.88
Yes	13.99±3.39	12.38±2.57	12.92±3.15	12.14±2.3	12.84±2.23
<i>P</i> value	<0.001	<0.001	<0.001	<0.001	<0.001
Local residence					
Urban	15.29±2.65	13.73±2.61	14.22±2.74	13.26±2.32	14.11±2.05
Rural	15.17±2.99	13.55±2.71	13.96±2.98	12.62±2.44	13.75±2.29
<i>P</i> value	0.66	0.49	0.382	0.006	0.106

\*Some data were missing in this domain

support, Mean = 13.09), indicating not very good financial resources, opportunities for acquiring new information and skills and leisure activities. Most SD from mean (SD = 2.82) was observed in DOM3 (Social Relationships). Greater SD of mean obtained from DOM3 might be associated

with different interpretations of the questions used in this domain and also small number of questions. As Table 4 shows, mean scores of four domains were different and statistically significant. The most difference was observed between DOM1 and DOM4. In Mazaheri' study observed that mean

**Table 6 :** Backward multiple linear regression analyses of significant factors associated with QOL

QOL domains	Variables	Unstandardized coefficients		Standardized coefficients	<i>t</i>	<i>P</i> value
		B	SE	Beta		
Domain 1	Chronic disease existence	-1.73	0.26	-0.28	-6.657	<0.001
Domain 2	Sex	-0.715	0.227	-0.132	-3.153	0.002
	Education years	0.625	0.223	0.119	2.807	0.005
Domain 3	Chronic disease existence	-1.645	0.248	-0.277	-6.622	<0.001
	Chronic disease existence	-1.74	0.276	-0.279	-6.21	<0.001
Domain 4	Education years	0.75	0.201	0.158	3.74	<0.001
	Chronic disease existence	-1.188	0.226	-0.222	-5.251	<0.001
Total	Education years	0.407	0.187	0.096	2.184	0.029
	Chronic disease existence	-1.616	0.204	-0.346	-7.914	<0.001

QOL=Quality of life

scores of four domains were different and the most difference was between DOM1 and DOM4.<sup>[40]</sup> As seen in Table 5, the mean score of satisfaction rating in DOM1, DOM2 and DOM3 was higher in males than females but this difference was only statistically significant in DOM2 (Psychological Health). Some factors may be associated with lower psychological health in women as well as their job (e.g., pregnancy, delivery, milking, homemaking and so on) that need to do more investigation.

In this study, item 4 in responses had upper mean score (3.97) and item 14 had lower mean score (2.44). In Nedjat' study observed that items 3 and 4 in responses had upper mean score and item 14 had lower mean score.<sup>[42]</sup> In this study after use of multiple linear regression (as shows in Table 6) observed that chronic disease existence is most important factor that affects QOL of study population in total and four domains of WHOQOL. Sex and education years were other factors that affect QOL of study population. In Abdollahpour' study, the influential factors affecting each domain were: educational level and current disease in the physical health domain, employment status in the psychological health domain, status of house ownership and number of years employed in the environmental health domain and marital status in the social relationship domain.<sup>[43]</sup>

## CONCLUSIONS

The findings from this study confirm that the WHOQOL-BREF questionnaire is a reliable instrument to measure quality of life in health-care staff. From the data it appears that Neyshabur

health-care staffs have WHOQOL-BREF scores that might be considered to indicate a relatively moderate quality of life. In this study observed that chronic disease in health-care staff is important health issue influencing quality of life of them.

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