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ORIGINAL ARTICLE

Quality of life among an Iranian general population sample using the World Health Organization's quality of life instrument (WHOQOL-BREF)

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Abstract
Objectives To assess subjective quality of life of an Iranian general population sample.
Methods This was a population-based study. Quality of life was measured using the WHOQOL-BREF. The associations between socio-demographic variables and quality of life were assessed by both univariate and multivariate analyses.
Results In all, 1,164 individuals were studied. The mean age of the participants was 37.6 (SD = 13.2) years, and the mean score for quality of life domains (physical, psychological, social relationship and environment domains) was 14.3 (SD = 2.6), 13.4 (SD = 2.6), 13.9 (SD = 2.6), and 12.3 (SD = 2.4), respectively. The results obtained from univariate analysis did not show a consistent pattern for association between demographic variables and quality of life domains. However, multivariate regression analysis showed that self-reported health condition was the most significant contributing factor to the decreased scores for all domains.
Conclusions Overall, quality of life scores were found to be low among an Iranian general population and greatly varied by socio-demographic variables. In addition, self-reported health condition was found to be the strongest factor affecting people's quality of life.

Keywords Quality of life · WHOQOL-BREF · General population · Iran

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Introduction

Quality of life (QOL) is a broad concept that could be defined in different ways, but there is a considerable agreement among experts that QOL is multi-dimensional and can be assessed from objective and subjective perspectives (Skevington et al. 2004; Izutsu et al. 2005; Bonomi et al. 2000). The World Health Organization Quality of Life group defines QOL as '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' (The WHOQOL Group 1993). Accordingly, in order to measure quality of life, they developed a cross-culturally valid instrument namely the World Health Organization's Quality of Life Instrument; the WHOQOL-100 (The WHOQOL Group 1998). It includes four items for each of the 24 facets of QOL and four items relating to 'overall quality of life and general health' facet.

The WHOQOL-BREF is being developed as a short version of the WHOQOL-100. It is a 26-item generic

instrument (1 item for each of 24 facets and 2 items relating to overall quality of life and general health' facet). In addition to the general facet, the construct labels of the instrument's domains that are used to capture the meaning of items are physical health, psychological, social relationships, and environment. The WHOQOL-BREF has been translated and used in studies of QOL in more than 40 countries and showed satisfactory psychometric results (Bonomi et al. 2000; Min et al. 2002; Hwang et al. 2003; Skevington et al. 2004; Hanestad et al. 2004; Noerholm et al. 2004; Izutsu et al. 2005; Berlim et al. 2005; Jaracz et al. 2006; Nedjat et al. 2008; Ohaeri and Awadalla 2009). Although the questionnaire has been criticized on several grounds (Hagerty et al. 2001; Cummins 2005), it is argued that WHOQOL-BREF and its indices have clear practical applications in studies of overall quality of life, indicating how people are satisfied or bothered by important aspects of their life.

Although some health-related QOL data exist for Iranians, there are no enough data on quality of life per se from Iran. Thus, we used the WHOQOL-BREF to generate detailed QOL data for an Iranian general population sample in Tehran. Also, the study aimed to investigate socio-economic group differences in quality of life scores. It was thought that this might help to contribute to the existing literature on the topic, and assist health care system in particular and the wider Iranian society in general by providing normative data for future studies in different populations in Iran.

Methods

The questionnaire

The WHOQOL-BREF was used to assess subjective QOL. As mentioned earlier it consists of 26 items and covers four QOL dimensions: physical health (7 items), psychological (6 items), social relationships (3 items) and environment (8 items). The remaining two questions evaluate a general facet relating to overall quality of life and general health There are three ways of calculating the WHOQOL-BREF scores: raw scores, scores ranging from 4 to 20, and scores ranging from 0 to 100, where higher scores represent better QOL.

In this study, the Iranian version of WHOQOL-BREF was used. The psychometric properties of this version are reported elsewhere (Nedjat et al. 2008). In summary, after forward–backward translation of the English language version of the instrument, the provisional Persian version was provided. Then it was pilot tested and the final version was used in this study. All domains met minimum reliability standards (Cronbach's alpha and test–retest correlation coefficient >0.70; except for social relationships, alpha = 0.55). Also the convergent and divergent validity of the questionnaire were found to be adequate. We used the 4–20 scoring approach. The average score of items within each domain is used to calculate the raw scores. The average raw scores for each domain (ranging from 1 to 5) were then multiplied by 4 to obtain a score ranging from 4 to 20 for each domain (The WHOQOL Group 1996; Saxena et al. 2001). In addition, we computed the 0–100 scores and presented the results in "Appendix 1" so that one could compare the findings with other national general studies reporting their findings on 0–100 basis.

Study population

This was a population-based study of QOL among a sample of citizens aged 18 years and over in Tehran, Iran, in the year 2007. To select a representative sample of individuals living in Tehran, a stratified multistage area sampling was applied. Every household within all 22 districts of Tehran had the same probability to be sampled. For the purposes of the first stage, units (census sections) were randomly selected after stratifying by region and size of residence. Then, within each census section the homes to be sampled were selected using the procedure of random routes. Finally, the last stage sampling units (the individuals) were selected randomly from all persons living in the same home. A team of trained interviewers collected data and all participants were interviewed in their homes. In this random sample, there were healthy individuals (who stated to be free of a chronic medical condition and not receiving any therapeutic interventions) and ill participants (who reported to have one or more medical conditions and receiving some form of medical care). This was an item in the introductory part of the questionnaire asking each respondent to report on his or her health status.

Statistical analysis

Data analysis was performed using SPSS 11.5. We assessed the association between demographic variables and quality of life scores using both univariate and multivariate analyses. Univariate analyses included *t* test and one way analysis of variance while multivariate analysis was performed using the linear regression analysis (enter model), where domain scores were considered as dependent and socio-demographic variables as independent variables.

Ethics

The Ethics Committee of Tehran University of Medical Sciences approved the study. All participants gave their verbal consent.

Results

Study population

In all 1,210 individuals were approached. Of these 1,164 agreed to be interviewed and were included in the analysis (558 male and 606 female). The participants' characteristics are presented in Table 1. The mean age of participants was 37.6 (SD = 13.2) years (ranging from 18 to 70), and the mean years of their formal education was 10.8 (SD = 4.4). Overall, 258 respondents (22.2%) reported that they were suffering from an illness and receiving some form of medical care for their conditions.

Quality of life in Iran

QOL domain scores are shown in Table 1. The mean scores for physical, psychological, social relationships, and environment domains were 14.3, 13.4, 13.8, and 12.3, respectively. The mean score for the general facet was 14.1 (SD = 2.9). There were significant association between almost all demographic variables and quality of life scores. The results obtained from univariate analysis indicated that physical health was associated with age ($P < 0.001$), gender ($P = 0.003$), marital status ($P < 0.001$), education ($P < 0.001$) and health condition ($P < 0.001$). Psychological health was associated with age ($P < 0.001$), marital status ($P = 0.002$), education ($P < 0.001$) and health condition ($P < 0.001$); social relationships was associated with gender ($P = 0.006$); marital status ($P = 0.008$), education ($P = 0.01$), and health condition ($P < 0.001$); and environment domain was associated with age ($P < 0.001$), gender ($P < 0.001$), education ($P < 0.001$), and health condition ($P < 0.001$).

Linear regression analysis was performed to assess the extent to which socio-demographic variables were contributed to domain scores. The domain scores were the

Table 1 The characteristics of the study sample and QOL scores among different subgroups, Tehran, Iran, 2007 ($n = 1,164$)

	Frequency (%)	Physical health Mean (SD)	Psychological health Mean (SD)	Social relationships Mean (SD)	Environment Mean (SD)	General facet Mean (SD)
Age groups						
18–20	100 (8.6)	15.4 (1.8)	14.4 (2.1)	14.4 (2.4)	13.3 (2.2)	15.9 (2.0)
21–30	323 (27.7)	14.9 (2.3)	13.7 (2.5)	13.9 (2.5)	12.4 (2.3)	14.9 (2.6)
31–40	271 (23.3)	14.3 (2.5)	13.1 (2.6)	13.7 (2.5)	12.0 (2.4)	14.1 (3.0)
41–50	237 (20.4)	14.1 (2.4)	13.2 (2.5)	13.7 (2.5)	12.3 (2.2)	13.3 (2.9)
51–60	166 (14.3)	13.3 (2.6)	13.2 (2.8)	13.7 (2.6)	12.0 (2.4)	13.0 (3.2)
+61	67 (5.8)	12.2 (3.1)	12.7 (2.7)	13.2 (2.6)	11.6 (2.4)	12.4 (3.2)
P value (*F* statistics)		<0.001 (23.2)	<0.001 (5.9)	0.09 (1.9)	<0.001 (6.2)	<0.001 (27.4)
Gender						
Male	558 (47.9)	14.5 (2.5)	13.5 (2.6)	13.6 (2.6)	11.9 (2.5)	14.0 (3.0)
Female	606 (52.1)	14.1 (2.5)	13.3 (2.5)	14.0 (2.4)	12.6 (2.2)	14.1 (3.0)
P value (*t* value)		0.003 (−3.02)	0.16 (−1.4)	0.006 (2.8)	0.001 (5.1)	0.43 (0.79)
Marital status						
Single	787 (67.6)	15.1 (2.3)	13.9 (2.6)	13.7 (2.6)	12.5 (2.5)	14.8 (2.7)
Married	320 (27.5)	14.1 (2.6)	13.3 (2.6)	13.9 (2.5)	12.3 (2.4)	13.8 (3.0)
Divorced	14 (1.2)	14.0 (3.9)	13.1 (3.0)	11.9 (3.2)	12.1 (2.8)	13.4 (2.9)
Widowed	39 (3.4)	13.2 (2.7)	12.6 (2.7)	13.7 (2.7)	12.0 (2.2)	12.6 (3.4)
P value (*F* statistics)		<0.001 (16.1)	0.002 (5.1)	0.008 (3.9)	0.42 (0.9)	<0.001 (12.1)
Education						
No formal education	50 (4.3)	12.1 (2.7)	12.0 (2.6)	13.2 (2.4)	11.2 (2.1)	11.5 (3.4)
Primary	194 (16.7)	13.2 (2.7)	12.8 (2.6)	13.6 (2.5)	11.9 (2.4)	12.9 (3.2)
Secondary	620 (53.3)	14.7 (2.4)	13.4 (2.5)	13.7 (2.5)	12.4 (2.3)	14.3 (2.8)
Higher	299 (25.7)	14.7 (2.3)	14.0 (2.4)	14.2 (2.6)	12.4 (2.4)	14.8 (2.7)
P value (*F* statistics)		<0.001 (31.5)	<0.001 (16.0)	0.01 (3.6)	<0.001 (6.1)	<0.001 (31.9)
Health condition						
Ill	258 (22.2)	12.4 (2.6)	12.3 (2.6)	13.2 (2.9)	11.4 (2.4)	12.1 (3.3)
Healthy	906 (77.8)	14.8 (2.2)	13.7 (2.5)	14.0 (2.4)	12.6 (2.4)	14.6 (2.6)
P value (*t* value)		<0.001 (13.9)	<0.001 (7.9)	<0.001 (4.2)	<0.001 (6.3)	<0.001 (13.1)
All	1,164	14.3 (2.5)	13.4 (2.5)	13.8 (2.5)	12.3 (2.4)	14.1 (2.9)

dependent variables while sex, age, marital status, and health condition were variables contributed to domain scores. Overall, self-reported health condition was found to be the strongest predictor of poorer QOL for all domains (beta ranged from −0.11 for the social relationships domain to −0.30 for the physical health domain, $P < 0.001$), and higher education had a positive effect on Iranians QOL. The results are shown in Table 2.

Discussion

This study provides useful information on subjective QOL among Iranians. Compared to other countries it seemed that QOL in Iran was lower than those reported in the literature (for example see the "Appendix 2"). Therefore, the fact that the quality of life in Iran was lower than other countries is worthy of note and requires further consideration especially about issues related to environment domain. The environment domain focuses on financial resources, physical safety, social and health care, the available opportunities for acquiring new information, recreational opportunities, physical environment (sound and air pollution, etc.), and transport. In view of the noted limitations of the WHOQOL instruments such as its pure subjectivity or low psychometric characteristics for social relationships, it is necessary to confirm these findings in further studies with more objective-standardized instruments (Hagerty et al. 2001). A recent publication indicated that the WHOQOL-BREF should only be used with great caution in cross-national comparisons (Theuns et al. 2010).

In the present study, physical health score was significantly higher in men than in women, though for the two other domains (social relationships and environment) women's scores were significantly higher than men (Table 1). Studies using the SF-36 questionnaire in Iran also showed similar results (Montazeri et al. 2005). However, the SF-36 questionnaire is only concerned with measuring health-related QOL and does not measure social relationships and environment domains.

As presented in Table 2, all domains were affected by health condition. Similarly, a study from Norway using the WHOQOL-BREF showed that self-reported disease was the strongest factor affecting people's quality of life scores. The findings obtained from multiple regression analysis with sex, age, education, cohabitation, and self-reported disease as independent variables explained 28, 8, 4, and 15% of the variance for the physical health, psychological, social relationships and environmental domains, respectively (Hanestad et al. 2004). A recent study in an Arab general population (Kuwaiti nationals) using similar instrument reported that depression was the most important predictor of QOL, accounting for over 77% of total variance observed (Ohaeri et al. 2009). However, this might differ in different populations. For instance, a study from Sudan reported that the direct predictors of QOL were 'life satisfaction' and 'sense of enjoyment' (Ohaeri et al. 2007). Interestingly, a study from Korea found that the physical health domain contributed most in overall quality of life, while the social domain made the least contribution (Min et al. 2002). Perhaps with such observations, as suggested, it would be helpful to combine domains from the WHO models and the local models to develop rigorous definitions of QOL for each nation (Ohaeri et al. 2007). It is obvious that there would be more similarities among different populations. As a part of WHOQOL pilot field trial on 4,804 respondents from 15 centres of 14 developed and developing countries using 12 languages, a study on the importance ratings on WHOQOL-BREF items found that in the global pooled sample, some of the general items (e.g. daily living activities, having energy, health) occupied the top ranks, while sexual life and body image and appearance were at the bottom (Saxena et al. 2001).

Overall, subjective quality of life was found to be low among an Iranian general population and greatly varied by socio-demographic variables. In addition, self-reported health condition was found to be the strongest factor affecting people's QOL. The findings might have policy implications including policies for improving public health. Indeed, in order to improve QOL in Iran, the call for

Table 2 Association between different socio-demographic variables and quality of life domain scores, Tehran, Iran, 2007 ($n = 1{,}164$)

	Physical health		Psychological health		Social relationships		Environment		General facet	
	β*	P value	β*	P value	β*	P value	β*	P value	β*	P value
Age (year)	−0.16	<0.001	−0.02	0.62	−0.10	0.007	−0.05	0.18	−0.21	<0.001
Sex (female/male)	0.02	0.35	0.002	0.94	−0.08	0.006	0.17	<0.001	0.09	0.001
Education (year)	0.12	<0.001	0.15	<0.001	0.05	0.07	0.06	0.03	0.16	<0.001
Marital status (unmarried/married)	−0.01	0.68	−0.003	0.93	−0.14	<0.001	−0.006	0.85	−0.06	0.06
Health condition (Ill/healthy)	−0.30	<0.001	−0.19	<0.001	−0.11	<0.001	−0.17	<0.001	−0.28	<0.001
Adjusted R^2	0.19		0.72		0.38		0.64		0.21	

* Standardized regression coefficients derived from multivariate linear regression

appropriate interventions such as national programs on psychosocial care seems necessary.

Conflict of interest None.

Appendix 1

See Table 3.

Table 3 The WHOQOL-BREF scores for an Iranian general population in different subgroups on the basis of 0–100 scoring approach, Tehran, Iran, 2007 ($n = 1{,}164$)

	Physical Mean (SD)	Psychological Mean (SD)	Social relationships Mean (SD)	Environment Mean (SD)	General facet Mean (SD)
Age groups					
18–20	71.3 (11.6)	65.2 (13.5)	65.2 (15.4)	58.7 (13.8)	74.4 (12.2)
21–30	68.6 (14.4)	60.8 (15.7)	62.2 (15.7)	52.9 (15.0)	68.5 (16.4)
31–40	64.8 (15.9)	57.3 (16.3)	60.1 (16.0)	50.4 (15.5)	62.9 (18.5)
41–50	63.4 (15.1)	57.5 (15.8)	61.0 (16.2)	52.2 (14.4)	58.1 (18.0)
51–60	58.5 (16.8)	57.8 (17.6)	61.1 (16.5)	50.6 (15.3)	56.5 (20.3)
+61	51.7 (18.9)	54.8 (17.2)	58.1 (16.3)	48.0 (15.6)	52.2 (20.2)
Gender					
Male	65.9 (15.7)	59.6 (16.6)	60.2 (16.4)	49.7 (15.7)	62.5 (18.9)
Female	63.1 (16.2)	58.3 (15.8)	62.8 (15.6)	54.2 (14.2)	63.4 (18.6)
Marital status					
Single	69.5 (14.2)	61.6 (15.9)	60.4 (16.2)	53.2 (15.4)	67.7 (17.1)
Married	62.9 (16.1)	58.2 (16.1)	62.4 (15.7)	51.8 (15.0)	61.5 (18.8)
Divorced	62.8 (24.2)	56.6 (19.0)	49.4 (20.3)	50.6 (17.5)	58.9 (18.6)
Widowed	57.2 (16.9)	53.6 (16.9)	60.8 (16.7)	50.1 (13.6)	53.8 (21.5)
Education					
No formal education	50.4 (17.0)	49.3 (15.7)	57.8 (15.3)	45.7 (13.4)	46.8 (21.1)
Primary	58.0 (17.1)	55.1 (16.6)	60.4 (15.8)	49.4 (15.2)	55.6 (19.8)
Secondary	66.3 (15.3)	58.9 (16.0)	61.2 (15.9)	53.0 (14.9)	64.3 (17.7)
Tertiary	67.4 (14.4)	62.9 (15.2)	63.9 (16.3)	52.8 (15.5)	67.6 (16.8)
Health condition					
Ill	53.1 (16.6)	51.9 (16.3)	57.9 (18.1)	46.9 (15.0)	50.3 (20.6)
Healthy	67.7 (14.3)	60.9 (15.7)	62.6 (15.2)	53.5 (14.8)	66.6 (16.5)
All	64.5 (16.0)	58.9 (16.2)	61.6 (16.0)	52.0 (15.1)	63.0 (18.7)

Appendix 2

See Table 4.

Table 4 QOL scores for an Iranian general population (Tehran, Iran, 2007) and the findings from WHO study

	Physical health Mean (SD)		Psychological health Mean (SD)		Social relationships Mean (SD)		Environmental domain Mean (SD)	
	Iran	Other countries	Iran	Other countries	Iran	Other countries	Iran	Other countries
Age* (years)								
<20	15.4 (1.8)	15.6 (2.9)	14.4 (2.1)	14.8 (2.8)	14.4 (2.4)	14.9 (3.1)	13.3 (2.2)	14.4 (2.4)
21–30	14.9 (2.3)	15.0 (2.9)	13.7 (2.5)	14.3 (2.8)	13.9 (2.5)	14.5 (3.4)	12.4 (2.3)	13.7 (2.6)
31–40	14.3 (2.5)	14.0 (3.0)	13.1 (2.6)	13.9 (2.8)	13.7 (2.5)	14.0 (3.2)	12.0 (2.4)	13.6 (2.7)
41–50	14.1 (2.4)	13.9 (2.9)	13.2 (2.5)	14.0 (2.7)	13.7 (2.5)	14.1 (3.1)	12.3 (2.2)	13.9 (2.6)
51–60	13.3 (2.6)	13.3 (2.9)	13.2 (2.8)	13.8 (2.8)	13.7 (2.6)	14.1 (2.9)	12.0 (2.4)	14.0 (2.6)
61+	12.2 (3.1)	14.2 (3.0)	12.7 (2.7)	14.1 (2.8)	13.2 (2.6)	14.2 (3.2)	11.6 (2.4)	13.8 (2.6)
Gender								
Male	14.5 (2.5)	14.3 (2.9)	13.5 (2.6)**	14.2 (2.8)	13.6 (2.6)**	14.1 (3.2)	11.0 (2.5)**	12.7 (2.4)
Female	14.1 (2.5)	14.2 (4.1)	13.3 (2.5)**	14.0 (2.8)	14.0 (2.4)	14.4 (3.1)	12.6 (2.2)**	13.9 (2.6)
Health condition*								
Ill	12.4	13.1	12.3	13.7	13.2	14.0	11.4	13.8
Healthy	14.8	15.4	13.7	14.8	14.0	14.8	12.6	14.1
All	14.3 (2.5)**	16.2 (2.9)	13.4 (2.5)**	15.0 (2.8)	13.8 (2.5)**	14.3 (3.2)	12.3 (2.4)**	13.5 (2.6)

Derived from (Skevington et al. 2004)

* The precise number of participants or SD was not reported in the WHO study and so we could not compare the estimates statistically

** P value < 0.001 derived from t test comparing quality of life scores between Iran and other countries

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