



Application of the World Health Organization Quality of Life Instrument, Short Form (WHOQOL-BREF) to patients with endometriosis

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Objective

Endometriosis, a common hormone-dependent chronic inflammatory disease causes various symptoms including pelvic pain, which affect the physical and psychological quality of life in women of reproductive age. The present study aimed to assess the quality of life of Iranian women with endometriosis using the World Health Organization Quality of Life Instrument, Short Form (WHOQOL-BREF) questionnaire.

Methods

This cross-sectional study performed in Tehran between October 2014 and July 2016 included 70 Iranian women with endometriosis. The Iranian version of the WHOQOL-BREF questionnaire was used to measure quality of life in these women. The Pearson's correlation coefficient, the paired and the independent *t*-tests, and a linear regression model were used to statistically analyze the data using the SPSS software version 16.0.

Results

The total mean score of the WHOQOL-BREF questionnaire was 80.58. The highest and the lowest mean scores were observed in the environmental (28.15) and the physical health domains (10.59), respectively. A multiple linear regression model (backward method) showed that insurance coverage was associated with the total WHOQOL-BREF score, whereas age, insurance coverage, and income level were associated with domains 1 through 4, respectively ($P < 0.05$).

Conclusion

Endometriosis affects various aspects of the quality of life of Iranian women who therefore require holistic management focused on both, the physical and psychological aspects of treatment.

Keywords: Endometriosis; Quality of life; WHOQOL

Introduction

The prevalence of endometriosis is higher than that of breast cancer and diabetes, and approximately 70 million women are diagnosed with endometriosis globally [1]. In Canada and the United States, the incidence of endometriosis ranges from 5–15% in women of reproductive age and 2–5% in postmenopausal women [2-4]. Most women with endometriosis are asymptomatic and only 6–10% of women report pelvic pain [5,6]. However, this chronic gynecological condition is as-

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sociated with diverse symptoms including chronic pelvic and lower back pain, dyspareunia, infertility, and dysmenorrhea [7,8].

Dyspareunia, dysmenorrhea, and infertility directly affect different aspects of the quality of life (QOL) including the social, environmental, physical, and psychological dimensions [9] in women of reproductive age [10]. Additionally, cyclic pelvic pain is a dominant symptom of endometriosis that may worsen with time and is known to interfere with a woman's health from a holistic point of view [9,11,12]. In addition to clinical symptoms, women with endometriosis experience several non-clinical symptoms including depression, emotional disturbances, sexual difficulties, difficulty with social commitments, and lack of energy [13].

QOL is defined by the World Health Organization (WHO) 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." [14]. Endometriosis affects a woman's QOL by influencing physical functioning and daily activities, interfering with intimate relationships, causing diagnostic delay, as well as affecting mental health and work productivity [10,13].

The WHO Quality of Life Instrument, Short Form (WHOQOL-BREF) questionnaire is a commonly utilized generic measure of QOL used to assess QOL in healthy individuals and in different patient groups [15,16]. The WHOQOL-BREF questionnaire is available in several languages and has been translated into Persian and validated in Iran by Nejat et al. [17]. However, this standard instrument has not been used to evaluate the QOL in Iranian women with endometriosis. The present study aimed to study the QOL in Iranian women with endometriosis using the WHOQOL-BREF.

Materials and methods

This cross-sectional study included women with stage 3–4 of endometriosis, who were referred for laparoscopic surgery to Hazrat Rasool Akram Hospital, Tehran, Iran between October 2014 and July 2016.

We recruited women who were deemed suitable candidates for laparoscopic surgery to treat endometriosis. Preoperative diagnosis was based on a patient's clinical signs and symptoms and ultrasonography findings. Our team of surgical experts confirmed the diagnosis and staging of endometriosis

during laparoscopy.

The inclusion criterion for this study was women diagnosed with endometriosis for at least a year, who received only medical treatment for dysmenorrhea, dyspareunia, pelvic pain, and painful defecation and/or urination. Exclusion criteria were women with a history of surgery for endometriosis (laparoscopy or laparotomy), women diagnosed with infertility, women with a history of chronic diseases including diabetes, renal disease, and rheumatological disorders, women with psychological disorders including depression, eating disorders and obesity, insomnia, schizophrenia, and other severe mental illnesses treated medically, as well as women in whom diagnosis of endometriosis could not be confirmed.

Questionnaires were completed preoperatively at the time of the last preoperative visit. All patients signed written informed consent after they had been informed regarding the purpose of the study and were reassured that all patient information would remain confidential.

1. Procedure and study instrument

Questionnaires were completed through face-to-face interviews at the time of the woman's last preoperative visit. The Persian version of the WHOQOL-BREF was used in this study. This instrument contains 2 items from the "Overall QOL and General Health" and "24 items of satisfaction" divided into 4 domains: physical health (domain 1, 7 items), psychological health (domain 2, 6 items), social relationships (domain 3, 3 items), and environmental health (domain 4, 8 items). Each item is scored on a 5-point Likert scale from 1–5. Based on guidelines, raw domain scores for the WHOQOL are transformed to a 4–20 score [18]. Domain scores are scaled in a positive direction (i.e., lower scores denote lower QOL). The mean score of items within each domain is used to calculate the domain score and are transformed linearly to a 0–100-scale [18–20].

2. Dependent and independent variables

In this study, the 4 domains of the WHOQOL-BREF questionnaire were considered dependent variables and other data (age, education level, marital status, income level [per month], and insurance coverage) were considered independent variables. Age was categorized as: women aged ≤ 30 and > 30 years. Education level was categorized as: illiterate and literate women. Marital status was categorized as: single/divorced and married women. Income level was categorized as: in-

come ≤ 280 and >280 per month. Insurance coverage was categorized as: yes and no.

3. Statistical analyses

All data were analyzed using the SPSS software version 16 (IBM Corp., Chicago, IL, USA). Descriptive analyses performed included estimation of frequencies, percentages, ranges, means, and standard deviations. The reliability of the WHOQOL-BREF domains and the overall QOL was assessed using Cronbach's alpha (≥ 0.70 was considered acceptable) [21]. The Pearson's correlation coefficient was used to determine the level of agreement between the 4 domains of the WHOQOL-BREF. A linear regression model (backward method) was used to investigate the association between patient's QOL and their characteristics. Transformed scores were used for statistical analyses for all domains, and the level of significance was set at $P < 0.05$.

Results

In this study, 70 women with endometriosis completed the WHOQOL-BREF questionnaire (Fig. 1). The characteristics of

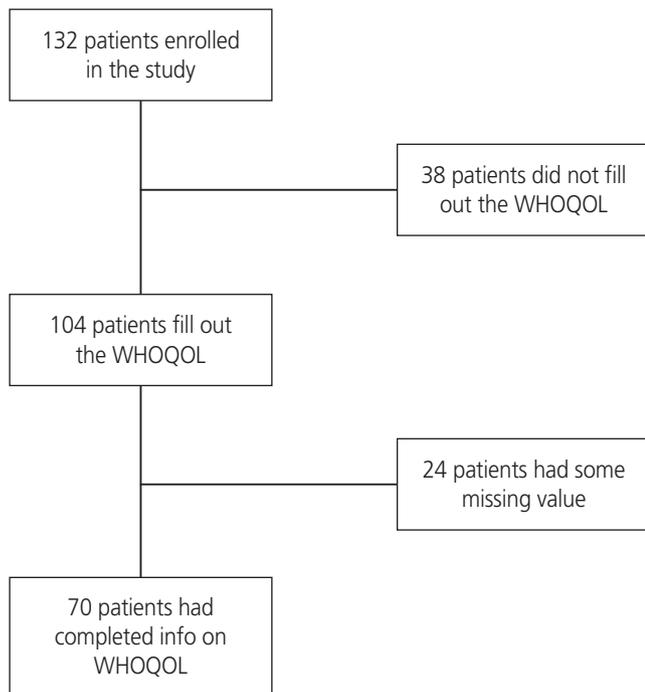


Fig. 1. Flow chart showing patient enrollment in the study. WHOQOL, World Health Organization Quality of Life Instrument.

our study population are shown in Table 1. The mean age of women was 32.11 ± 7.56 years.

The Cronbach's alpha coefficient that assessed the internal consistency of the WHOQOL-BREF questionnaire (24 items) was adequate (0.870), and the values for each domain were: domain 1 (0.798), domain 2 (0.852), domain 3 (0.847), and domain 4 (0.984). Statistically significant correlations were observed between all domains of the WHOQOL-BREF, as shown in Table 2. Furthermore, a statistically significant correlation was observed between the overall QOL (Q1) and different domain scores, except domain 3. A statistically significant correlation was also observed between the General Health (Q2) and different domain scores, except domain 3, as shown in Table 2.

Statistically significant differences were observed between all domains of the WHOQOL-BREF as shown in Table 3.

Among the different domains of the WHOQOL-BREF, the lowest mean score was observed in domain 1 (mean=10.59) and the highest in domain 4 (mean=28.15), as shown in Table 4. The mean score of the 4 domains and the total score of the WHOQOL-BREF based on independent variables (age, education level, marital status, income, and insurance coverage) are presented in Table 3. The mean scores of all domains in unmarried women were higher than those in married women except for domain 1, although this difference was statistically

Table 1. Demographic characteristics of the study population (n=70)

Characteristics	No. (%)
Age (yr)	
≤30	30 (42)
>30	40 (58)
Education years	
Illiterate	25 (35)
Literate	45 (65)
Marital status	
Unmarried	28 (40)
Married	42 (60)
Income level (\$/mon)	
≤280	45 (64.3)
>280	25 (35.7)
Insurance	
No	8 (11.5)
Yes	62 (88.5)

Table 2. Correlation coefficients showing the association between the overall quality of life and the general health items and the 4 domains of the World Health Organization Quality of Life Instrument, Short Form

Variables		Q1	Q2	DOM1	DOM2	DOM3	DOM4
Q1	CC	1.000	0.356	0.422	0.547	0.153	0.341
	P-value		0.002	<0.001	<0.001	0.207	0.004
Q2	CC		1.000	0.470	0.494	0.043	0.411
	P-value			<0.001	<0.001	0.727	<0.001
DOM1	CC			1.000	0.442	0.210	0.574
	P-value				<0.001	0.081	<0.001
DOM2	CC				1.000	0.010	0.570
	P-value					0.937	<0.001
DOM3	CC					1.000	0.236
	P-value						0.050
DOM4	CC						1.000
	P-value						

CC, correlation coefficient; DOM, domains — DOM1 (physical health), DOM2 (psychological health), DOM3 (social relationships), DOM4 (environmental health); Q1, overall quality of life; Q2, general health domain.

Table 3. Paired *t*-test analysis of the 4 domains of the World Health Organization Quality of Life Instrument, Short Form

Variables		Paired samples test						
		Mean	SD	95% CI		<i>t</i> -test	DF	P-value (2-tailed)
				Lower	Upper			
Pair 1	DOM1–DOM2	4.07	4.29	3.03	5.11	7.81	67	<0.001
Pair 2	DOM1–DOM3	12.35	4.43	11.29	13.41	23.28	69	<0.001
Pair 3	DOM1–DOM4	-5.02	4.30	-6.07	-3.98	-9.63	67	<0.001
Pair 4	DOM2–DOM3	8.30	4.00	7.33	9.27	17.10	67	<0.001
Pair 5	DOM2–DOM4	-9.07	4.05	-10.07	-8.07	-18.20	65	<0.001
Pair 6	DOM3–DOM4	-17.52	4.85	-18.70	-16.35	-29.79	67	<0.001

CI, confidence interval; DF, degree of freedom; DOM, domain — DOM1 (physical health), DOM2 (psychological health), DOM3 (social relationships), DOM4 (environmental health); SD, standard deviation.

non-significant (Table 4).

Table 5 shows the results of multiple linear regression analysis (backward method), which indicates that “insurance coverage” was significantly associated with the total WHOQOL, domain 1, and domain 4 scores. “Age” was associated with domain 2 and “income” with domain 3 scores.

Discussion

The results of the present study showed a high reliability (internal consistency) of the Persian version of the WHOQOL-BREF questionnaire in Iranian women with endometriosis (Cronbach’s alpha of 0.870). Reliability analyses performed by

Nedjat et al. [22] have indicated an acceptable level of reliability for the Persian version of the WHOQOL-BREF questionnaire; however, Cronbach’s alpha for the social relationship domain was low (<0.7) in the previous studies but acceptable in the present study (0.847).

Moreover, all domains of the questionnaire were positively correlated, except domain 3 and other domains.

Based on this reliable assessment tool, the present study established that among the different domains of the WHOQOL-BREF questionnaire, the lowest mean score was related to domain 1 (physical health) and the highest mean score to domain 4 (environmental health). Only a few studies have evaluated QOL in Iranian women with endometriosis [23]. Nojomi et al. [23] evaluated the QOL in Iranian women with

Table 4. Comparison between the mean scores of the 4 domains of the World Health Organization Quality of Life Instrument, Short Form based on age, education level, marital status, and income level

Variables	Physical health	Psychological health	Social relationships	Environmental health	Total
Total	10.59±1.94	18.81±3.46	22.97±4.47	28.15±4.79	80.58±10.82
Age (yr)					
≤30	10.27±1.46	19.65±2.99	23.68±4.77	28.50±4.33	82.53±10.73
>30	10.75±2.24	18.17±3.76	22.36±4.11	27.85±5.31	79.07±11.29
P-value (CI)	0.31 (-1.42-0.46)	0.04 (-0.21-3.16)	0.21 (-0.80-3.45)	0.59 (-1.77-3.07)	0.21 (-2.04-8.96)
Education years					
Illiterate	12.00±2.54	18.20±3.19	23.40±4.50	30.00±3.47	87.00±6.97
Literate	10.44±1.88	18.85±3.55	22.87±4.44	28.00±4.97	80.12±11.23
P-value (CI)	0.08 (-0.23-3.34)	0.69 (-3.93-2.62)	0.80 (-3.59-4.64)	0.43 (-3.06-7.06)	0.23 (-4.53-18.28)
Marital status					
Unmarried	10.14±1.91	19.53±3.40	23.17±4.89	28.96±5.26	82.73±11.96
Married	10.83±1.96	18.30±3.53	22.73±4.11	27.95±4.66	79.12±10.62
P-value (CI)	0.15 (-1.63-0.25)	0.15 (-0.47-2.94)	0.68 (-1.72-2.60)	0.26 (-1.07-3.80)	0.20 (-1.95-9.16)
Income level (\$/mon)					
≤280	10.91±1.50	18.47±2.91	23.08±4.21	28.30±4.29	81.04±9.73
>280	9.92±2.49	19.41±4.41	22.60±4.83	27.80±5.90	79.66±13.36
P-value (CI)	0.04 (0.03-1.94)	0.29 (-2.71-0.83)	0.66 (-1.72-2.69)	0.68 (-1.97-2.98)	0.63 (-4.33-7.09)
Insurance					
No	11.50±2.07	19.16±2.63	28.00±4.60	31.16±2.40	89.83±9.08
Yes	10.40±1.93	18.77±3.60	22.38±4.17	27.70±4.93	79.61±10.92
P-value (CI)	0.01 (0.86-6.07)	0.02 (0.79-10.42)	0.00 (2.01-9.20)	0.03 (0.98-19.44)	0.03 (0.69-19.73)

Values are presented as mean±standard deviation.

CI, confidence interval.

Table 5. Multiple linear regression analyses (backward method) of significant factors associated with the quality of life in women with endometriosis

QOL domains	Variables	Unstandardized coefficients		Standardized coefficients	T	P-value	95% CI	
		B	SE	Beta			Lower	Upper
Domain 1	Insurance	-5.61	1.80	-0.35	-3.11	0.00	-9.20	-2.01
Domain 2	Age	-1.47	0.84	-0.20	-1.73	0.02	-3.17	-0.21
Domain 3	Income	-1.03	0.48	-0.25	-2.12	0.03	10.50	13.28
Domain 4	Insurance	-3.46	2.04	-0.20	-1.69	0.05	-7.56	0.62
Total	Insurance	-10.21	4.62	-0.26	-2.21	0.03	-19.44	-0.98

CI, confidence interval; QOL, quality of life; SE, standard error.

endometriosis using the Endometriosis Health profile-30 and demonstrated that emotional well-being and pain domains showed the most significant association, which concurs with the results of the present study. Additionally, previous studies reported from other countries have described that endome-

triosis causes severe pain and symptoms that affect health-related QOL [24-26], which concurs with the results of the present study (the lowest mean score was observed in the physical health domain). Dyspareunia is also known to negatively affect a woman's sexual activity/relationships, QOL, and

self-esteem [27]. Pelvic pain and severity of endometriosis have been identified as the major predictors of loss of productivity [28]. As demonstrated by this present study, the wide range of painful symptoms in women with endometriosis significantly affects their QOL and necessitates appropriate diagnosis and treatment.

Notably, the mean scores of all 4 QOL domains in the present study were relatively low. Jones et al. [29] have reported that endometriosis affects all aspects of health-related QOL including physical functioning, role performance, energy/vitality, social functioning, intercourse, and emotional well-being. Moreover, it affects a woman's self-image, which corresponds to psychological and social aspects—a result that concurs with the present study. Endometriosis affects physical activity, as well as psychological and social behavior [27]. Thus, both, physical and psychological health require close attention in women presenting to gynecological clinics with endometriosis.

In the present study, a multiple linear regression model showed that insurance coverage and income level were significantly associated with domain 1, 4, and the total WHOQOL-BREF scores, which indicates the significant role of insurance coverage in low-income countries such as Iran, where health care costs significantly affect patients' QOL. Thus, it is suggested that health policy-makers should pay close attention to insurance coverage for the treatment of endometriosis.

Previous studies have reported improved QOL in women undergoing surgical treatment such as laparoscopic excision [30]. The results of the present study indicate an acceptable reliability of the WHOQOL-BREF questionnaire in women with endometriosis. Therefore, future studies need to focus on assessing the QOL in women with endometriosis after treatment to identify the efficacy of treatment modalities.

A notable strength of the present study is that this is the first study to validate the reliability of the Persian version of the WHOQOL-BREF questionnaire in Iranian women with endometriosis.

Limitations of our study are: 1) Convenience sampling related to the cross-sectional nature of the study could cause a selection bias and sampling error. 2) This was a single-center study, which limits the generalizability of our results.

Diminished QOL is considered one of the most important predictors of direct health care and total costs [31]; thus, it is necessary to pay greater attention to the QOL in patients with endometriosis. The results of the present study indicate a de-

cline in various dimensions of the QOL in a sample of Iranian women with endometriosis. Therefore, we emphasize that clinicians ought to adopt a holistic approach focused on both, the physical and the psychological health of women with endometriosis.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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