

## Health-Related Quality of Life and its Predictive Factors among Infertile Women

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### ARTICLE INFO

**Article type:**  
Original Article

**Article History:**  
Received: 13 Aug. 2011  
Accepted: 4 May. 2012  
ePublished: 25 Aug. 2012

**Keywords:**  
Quality of life  
Infertility  
Predictive factors  
Women

### ABSTRACT

**Introduction:** The present study aimed to determine health-related quality of life (HRQOL) and its predictive factors among infertile women. **Methods:** This cross-sectional study was conducted on infertile women referring to Majidi Infertility Center (Tabriz, Iran). The data was collected through self-administered questionnaires including clinical and demographic characteristics and the Persian version of 36-item short form health survey (SF-36). One-sample t-test, independent t-test, one-way analysis of variance (ANOVA), and logistic regression were used for data analysis. **Results:** Overall, 1012 infertile women were studied. The quality of life scores of infertile women in all eight subscales were significantly lower than normative data for Iranian women. Low physical component summary was more frequent in younger [adjusted odds ratio (AOR):1.45; 95% CI: 1.07-1.96], less educated (AOR: 1.75; 95% CI: 1.27-2.41), and low income (AOR: 1.52; 95% CI: 1.06-2.16) participants. It was less frequent in individuals whose infertility duration was 3-9 years (AOR: 0.65; 95% CI: 0.48-0.86), had male (AOR: 0.58; 95% CI: 0.43-0.78) or female and male factors infertility (AOR: 0.48; 95% CI: 0.30-0.78), or had a history of 1-2 in vitro fertilization (IVF), intrauterine insemination (IUI), or intracytoplasmic sperm injection (ICSI). Low mental component summary was associated with low income (AOR: 1.56; 95% CI: 1.11-2.18) and unexplained cause of infertility (AOR: 0.52; 95% CI: 0.32-0.56). **Conclusion:** The findings of this study indicated low quality of life among infertile women. The findings suggested the need for providing this group, especially those at higher risk such as low educated or low income females, with necessary support.

### Introduction

Infertility, as an individual and social problem, imposes enormous costs to be treated and can devastate the family. A couple is clinically considered to be infertile if pregnancy does not occur after at least one year of

unprotected intercourse.<sup>1</sup> More than 80 million people in the world, most of whom live in developing countries, suffer from infertility. While 10-15% of couples in the reproductive age are infertile, the figures can vary between 8% and 33% in different populations.<sup>2</sup> Male, female, and mutual problems consti-

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This article was derived from MSc thesis in the Tabriz University of Medical Sciences, No: 271.

tute 25-40%, 40-50%, and 10% of the reasons for infertility. However, 10% of infertility cases do not have a well-known cause.<sup>3</sup>

According to the latest census in Iran in 2006, the mean age of first marriage for females has increased to 23 years old. Such increase has caused them to try harder to get pregnant in the last years of their reproductive age.<sup>4</sup> Since birth giving is of high social, cultural, and religious importance in Iran, infertility seems to be a bigger problem. Non-governmental organizations and cultural associations, relatives, and acquaintances often have a vital and decisive role in the lives of infertile couples.<sup>5</sup> As a part of social background, demographic factors are effective on the way individuals deal with infertility problems and can thus affect quality of life among infertile couples.<sup>6</sup>

Few studies with contradictory results have investigated quality of life among infertile couples throughout the world. For instance in Tehran, infertile couples scored significantly less than the normal population in different aspects of quality of life.<sup>7</sup> In Italy however, the differences were not significant in any aspects of quality of life.<sup>8</sup> In a review article on 10 studies, Montazeri concluded that predictive factors of quality of life vary in different infertile populations, individuals, and races.<sup>9</sup>

According to the above mentioned facts, in order to develop effective interventions to improve quality of life, it is important to identify various effective factors on quality of life among infertile couples. Most previous studies have included specific groups of infertile couples. Therefore, we decided to conduct a study to determine the quality of life of infertile women who referred to an infertility center. We tried to evaluate the effects of some clinical and demographic characteristics on their quality of life.

## Materials and methods

In this cross-sectional study, 1021 eligible infertile women referring to Majidi Infertility Center (Tabriz, Iran) were selected through convenience sampling. Couples were in-

cluded if they had at least finished junior high school, had been diagnosed as infertile more than 6 months prior to the study, had no children from previous marriages, and were not in the last stages of treatments such as in vitro fertilization (IVF) or intracytoplasmic sperm injection (ICSI).

Data was collected by a questionnaire including demographic and clinical characteristics and the Persian version of the 36-item short form health survey (SF-36) which had already been validated. The reliability of the Persian version of SF-36 was approved with a Cronbach's alpha of 72-94%.<sup>10</sup> The SF-36 is a self-report tool that measures physical and mental health components using 35 items categorized into 8 subscales of physical functioning (10 items), role limitations due to physical problems (4 items), bodily pain (2 items), general health (5 items), vitality (4 items), social functioning (2 items), role limitations due to emotional problems (3 items), and mental health (5 items). An additional item measures health transition.<sup>11</sup>

Scores were determined based on a Likert scale, i.e. 5-choice and 3-choice items were scored as 0-4 and 0-2, respectively. Negative questions were inversely scored. Raw scores for each aspect were calculated as the sum of raw scores of each item. The scores were then multiplied by 100 and divided to the maximum achievable score to obtain a score between 0 and 100, as recommended by the SF community.<sup>12</sup> Higher scores thus indicated better quality of life.

In order to calculate physical (PCS) and mental (MCS) component summary scores, mean, standard deviation (SD), and standard weights of the American adult population were considered as international standard values.<sup>11,12</sup> Therefore, for each aspect, the standard mean value was subtracted from the obtained mean value. The result was then divided by the American SD and multiplied by the standard weights. The final values were summed up.

The results of a large population-based study in Tehran conducted by Montazeri et al. have been accepted as Iranian normative data. Therefore, in this study, we considered mean and SD values of the SF-36 subscales for 25-44 year-old male and female participants of their study, who were more close to our patients' age, as the standard values for normal men and women, respectively. Z-scores of various quality of life subscales were calculated through dividing the difference between the mean values by the SD in the standard population. Significance differences of quality of life between men and women (effect size) were determined through dividing the difference between mean values of the two sexes by SD among men. Differences were considered as significant if z-scores or effect sizes were less than -0.4 or above 0.4.

One-sample t-test was used to examine the significance of mean differences between the study population and the normative data. Associations between demographic and clinical variables and the PCS and MCS scores were initially estimated using one-way analysis of variance (ANOVA) or student's t-test. Binary logistic regression was then used to test the relations adjusted for potential confounding variables. To perform multivariate analysis, subjects were divided into two groups, i.e. those who scored equal to or

higher than mean PCS/MCS and those who scored less than mean.

## Results

Overall, 1012 infertile women enrolled in the study. The characteristics of the women are presented in Table 1. The mean age of women was 32.6 and mean infertility duration was 2.0 years.

Total score of quality of life among infertile women in all aspects was significantly lower than the standard values for Iranian females matched for age ( $p = 0.002$  for role limitations due to emotional problems subscale and  $p < 0.001$  for all other aspects) (Table 2).

Logistic regression analysis indicated that low PCS score was more frequent in younger ( $< 30$  years), less educated ( $\leq 12$  years of education), and low income ( $< 6,000,000$  Rials, equivalent to 650 US dollars in the study period) individuals, as well as those with 1-2 IVF, intrauterine insemination (IUI), or ICSI experiences (compared with no experience). Low PCS score was less frequent in women who had an infertility duration of 3-9 years (compared to those with a duration  $< 3$  years) and those whose infertility cause was male or both male and female factors. Low MCS score was more frequent in women who had low income and was less frequent in women whose infertility cause was unexplained (Table 3).

**Table 1.** The characteristics of the study participants

Characteristics	N (%)	Characteristics	N (%)
<b>Age (years)</b>		<b>Infertility duration (years)</b>	
< 25	250 (24.7)	< 3	430 (42.4)
25-29	373 (36.9)	3-4	265 (26.2)
30-34	247 (24.4)	4-9	210 (20.8)
$\geq 35$	142 (14.0)	10-15	80 (7.9)
Mean (SD)	28.4 (5.5)	$\geq 15$	24 (2.4)
<b>Education (years)</b>		Mean (SD)	2.0 (1.0)
6-12	339 (33.5)	<b>Causes of Infertility</b>	
12	362 (35.8)	Female factor	411 (40.5)
>12	311 (30.7)	Male factor	406 (40.0)
<b>Average monthly household income (1000 IRR)</b>		Both (female and male factors)	100 (9.9)
Less than 300	388 (38.0)	Unexplained	87 (8.6)
300-600	419 (41.0)	<b>Type of treatment</b>	
Higher than 600	214 (21.0)	Fertility drugs	316 (31.0)
<b>Place of living</b>		IVF	148 (14.0)
Urban	828 (81.3)	IUI	292 (28.6)
Rural	191 (18.7)	ICSI	157 (15.3)
		Unknown	99 (9.7)

**Table 2.** The SF-36 scores in infertile women (n = 1021) compared to the normative data\*

Subscales of SF36	Infertile women	Normative data	P
Physical functioning	74.5 (20.0)	86.1 ( 17.1)	< 0.001
Role limitations due to physical problems	64.3 ( 21.6)	68.8 ( 37.8)	< 0.001
Bodily pain	62.5 ( 21.3)	77.5 ( 24.7)	< 0.001
General health	61.7 (20.0)	65.6( 19.2)	< 0.001
Social functioning	63.6 ( 23.9)	75.3 ( 23.9)	< 0.001
Role limitations due to emotional problems	59.1 (24.4)	61.4 ( 42.5)	0.002
Vitality	52.0 (18.7)	63.2 (17.2)	< 0.001
Mental Health	56.9 ( 20.1)	63.8 (18.9)	< 0.001

\* Data for women from the general population aged 25-44 years in Tehran (Montazeri *et al.*)<sup>10</sup> values are expressed as mean ( SD)

**Table 3.** The results obtained from logistic regression analysis for poorer physical and mental health-related quality of life

	Physical component summary		Mental component summary	
	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)
<b>Age group (years)</b>				
< 30	0.37 (0.15)	1.45 (1.07-1.96)*	0.19 (0.15)	1.21 (0.90-1.61)
≥ 30	---	1.0 (ref.)	---	1.0 (ref.)
<b>Education (years)</b>				
≤12	0.56 (0.16)	1.75 (1.27-2.41)†	-0.28 (0.16)	0.76 (0.56-1.04)
>12	---	1.0 (ref.)	---	1.0 (ref.)
<b>Average monthly household income (10000 IRR)</b>				
Less than 600	0.42 (0.18)	1.52 (1.06-2.16)*	0.44 (0.17)	1.56 (1.11-2.18)†
Higher than 600	---	1.0 (ref.)	---	1.0 (ref.)
<b>Place of living</b>				
Urban	-0.13 (0.17)	0.87 (0.62-1.23)	-0.18 (0.17)	0.83 (0.60-1.17)
Rural	---	1.0 (ref.)	---	1.0 (ref.)
<b>Infertility duration (years)</b>				
< 3	---	1.0 (ref.)	---	1.0 (ref.)
3-9	-0.44 (0.15)	0.65 (0.48-0.86)†	0.27 (0.14)	1.31 (0.99-1.72)
≥ 10	0.20 (0.26)	1.22 (0.73-2.04)	0.37 (0.26)	1.45 (0.88-2.38)
<b>Causes of infertility</b>				
Female factor	---	1.0 (ref.)	---	1.0 (ref.)
Male factor	-0.55 (0.15)	0.58 (0.43-0.78)†	-0.02 (0.15)	0.98 (0.74-1.30)
Both (male and female factors)	-0.73 (0.24)	0.48 (0.30-0.78)†	-0.06 (0.23)	0.95 (0.60-1.48)
Unexplained	-0.48 (0.26)	0.62 (0.37-1.02)	-0.65 (0.26)	0.52 (0.32-0.86)*
<b>Frequency of IVF, IUI, ICSI</b>				
None	---	1.0 (ref.)	---	1.0 (ref.)
1-2	0.35 (0.16)	1.42 (1.03-1.96)*	-0.20 (0.16)	0.82 (0.60-1.12)
≥ 3	0.12 (0.20)	1.12 (0.76-1.66)	-0.03 (0.19)	0.97 (0.67-1.40)

\* p < 0.05; †p < 0.01

## Discussion

The results of the present study indicated low quality of life scores among infertile couples compared to the standard population. Therefore, it can be concluded that probably infertility reduces quality of life. In a study in Tehran, Iran, quality of life scores of infertile couples were reported to be lower than the standard population.<sup>7</sup> Low quality of life among infertile couples is probably due to their high levels of stress imposed by the

high costs of treatment, fatigue due to frequent references to health centers, concerns for the efficacy of the treatment, community's pressure, fear of losing the family and the spouse's interest, and also the potential stresses and tensions caused by treatment.<sup>9</sup> In addition, Iranian infertile couples receive inadequate financial and health support which might contribute in worsening the problem. As in the present study, those with low income had lower scores of physical and mental health. Studies in England<sup>13</sup> and Tabriz<sup>14</sup>

also showed low social and economic levels to be associated with poor health performance. Unlike the present study, an Italian study did not find any significant differences in scores of quality of life aspects between an infertile group and the standard group. These researchers reported that the absence of differences may be a result of the financial and health support systems in Italy.<sup>8</sup>

In the present study, women with female or both (female and male) factor infertility gained a lower score of physical health compared to participants with male factor infertility. Likewise, Lee et al. found women with female factor infertility to experience higher levels of stress and guilt compared to their husbands. They were also less accepted by their husband's family. Female factor infertility was thus considered as a threat for social status and security of women.<sup>15</sup>

In the present study, women under 30 years gained lower scores of quality of life in both physical and mental aspects. However, the difference was only significant in physical components. This finding was in accordance with the studies of Fekess et al.<sup>6</sup> and Rashidi et al.<sup>7</sup> in Tehran. As Alami et al. suggested, high levels of illogical thoughts toward having a child in young women could justify their impaired psychological performance and decreased quality of life properly.<sup>16</sup> In most societies, when a couple is first diagnosed as infertile, the problem is attributed to women. Their inability to give birth causes accusations by the husbands' families. Infertility of the woman would then provide is the husband with adequate reasons to get a divorce or to remarry.<sup>17</sup>

According to the low quality of life scores among infertile women in the present study, infertile couples, especially those at higher risk such as lower educated or low income individuals, should enjoy various kinds of support.

We also compared the results of this study with the findings of a study conducted in Tehran (as the standard Iranian population). Since confounding factors except infertility

might have been involved in the observed differences, further studies with a control group are required to determine the impact of infertility on quality of life.

### Ethical issues

None to be declared.

### Conflict of interest

The authors declare no conflict of interest in this study.

### Acknowledgments

Hereby, many thanks go to the authorities and staff of Tabriz Infertility Center and also the women who participated in this research.

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