Effect of male infertility on quality of life

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Background
Infertility is a condition with psychological, economic, medical implications, resulting in trauma and stress, particularly in a social setup, with a strong emphasis on child bearing.

Objective
To evaluate the effect of infertility on quality of life (QOL) and to determine what variables predict QOL in infertile men in Upper Egypt.

Patients and methods
This is a case–control study that included 200 married men, comprising 100 infertile men and 100 fertile men with at least one living child. Assessment of QOL was done using the 36-item Medical Outcomes Study Short-Form Health Survey.

Results
Compared with fertile controls, infertile men had lower scores in the following variables: role limitations owing to emotional health, energy/fatigue, emotional well-being, social functioning, and general health ($P < 0.001$). Moreover, our study revealed that QOL scores were negatively affected by increasing patient's age, prolonged duration of infertility, and lower educational status. However, type of infertility had not been considered as a significant predictor of poor or good QOL.

Conclusions
Infertile men had lower QOL than controls, which confirms the need for psychological support for those men.

Keywords:
male, infertility, quality of life

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Introduction

Infertility can be defined as failure to achieve clinical pregnancy after 12 months or more of regular unprotected sexual intercourse [1]. The particular nature of infertility problem and of infertility care makes them different from other medical problems and services in developing countries. Moreover, negative psychosocial, sociocultural, and economical consequences of childlessness are often more pronounced compared with Western societies [2,3].

The exact prevalence of infertility in developing countries is unknown owing to a lack of registration and well-performed studies [4]. Infertility affects ~ 8–12% of couples worldwide [5], with male factor infertility (MFI) accounting for 40–50% of the causes [6].

The desire to have children should be considered as a normal need that should be met [7]. Many studies demonstrate that infertile patients commonly experience feelings of depression, isolation, anxiety, grief, and inadequacy [7–9]. In Egypt, this is further aggravated by social pressure from spouse or other relatives, which is another factor that could worsen the quality of life (QOL) for infertile couples [9].

There are contradicting research studies whether men with MFI suffer more or less with infertility treatment. Although some studies emphasize severe negative effects on men's well-being and a reduced QOL when diagnosed with MFI [10,11], others point out that involuntary childlessness is challenging for all men, independent of diagnosis with MFI [12,13].

According to WHO, QOL is defined 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 [14]. Moreover, QOL is the feeling of overall life satisfaction, as determined by the mentally alert individual whose life is being evaluated [15].

Health-related quality of life (HRQOL) questionnaire has been now considered as a main tool for outcome measurement in infertile couples. Owing to different physical, psychological, and social adverse effects of

infertility, evaluating the components of QOL in these couples may lead to identification of different aspects of lifestyle in these populations and help them to schedule favorable treatment more efficiently [16,17].

So, our aim was to evaluate QOL of infertile men in Upper Egypt using 36-item Medical Outcomes Study Short-Form Health Survey (SF-36) questionnaire and to indicate what variables predict QOL in them.

Patients and methods

Patients

A total of 200 married men were included, where 100 infertile men served as a case group and 100 fertile men with at least one living child served as a control group. They were recruited from Outpatient Clinic of Andrology and Dermatology, Department of Dermatology, Venereology and Andrology, Assiut University hospitals, between March and December 2016.

The study was approved and monitored by the Medical Ethics Committee, Assiut Faculty of Medicine.

The investigators explained the steps and value of the research to all eligible participants, and verbal consent was taken.

Study design

This was a case–control study.

Exclusion criteria

The following were the exclusion criteria:

(1) Patients with chronic debilitating diseases (diabetes mellitus, hypertension, heart failure, chronic renal failure, and malignancy).
(2) Patients with major depression, anxiety, or on regular use of psychotropic drugs.

Methods

(1) Full history was taken.
(2) Thorough general and genital examination was done.
(3) Assessment of QOL was done using the SF-36 [18–20].

SF-36 is a generic questionnaire that measures the QOL in two major health dimensions (mental and physical health). The SF-36 includes eight subscales, and scores on each subscale range from 0 to 100, indicating worse to better conditions, respectively (higher scores indicate a better QOL). The eight subscales are physical functioning (10 questions), role physical (four questions), role emotional (three questions), energy/fatigue (vitality) (four questions), emotional well-being (five questions), social functioning (two questions), pain (two questions), and general health (five questions). It also includes a single item that provides an indication of perceived change in health.

Statistical analysis

Data entry and analysis were done using SPSS (spss: IBM company, New york , USA) version 19. Data were presented as number, percentage, mean, and SD. χ^2 test was used to compare between qualitative variables. An independent sample *t* test was used to compare quantitative variables between two groups, and analysis of variance test was done for more than two groups. Pearson correlation was done to measure correlation between quantitative variables. Nonparametric tests (Mann–Whitney *U* test and Spearman rank correlation) were used for non-normally distributed variables. *P* value was considered statistically significant when *P* value less than 0.05.

Results

Sociodemographic characteristics of the studied groups

The age of the patients ranged from 22 to 55 years, with a mean ± SD of 33.50 ± 7.24 years. Overall, 60 patients were from rural areas, and there were 60 cigarette smokers (Table 1).

The age of the control group ranged from 25 to 55 years, with a mean ± SD of 33.44 ± 6.61 years. A total of 63 persons were from rural areas, and there were 55 cigarette smokers.

The percentage of illiteracy among patients (24%) was higher than that among controls (15%), and the percentage of higher education among controls (16%) was higher than that in the patients (9%).

Clinical characteristics of patients

Most of the patients had primary infertility (72%). Concerning duration of infertility, it ranged from 1 to 33 years, with mean ± SD of 5.98 ± 5.73 years, with the majority having short duration (68% of the studied patients had duration <6 years). In patients with primary infertility (72 patients), 48 of them had infertility for 6 years or less (66.7%) and 33 patients had infertility for 3 years or less (45.8%) (Tables 2 and 3).

On comparing the duration of infertility in patients with primary and secondary infertility, the results showed significant difference (P = 0.0104), as the greater percentage of patients with primary infertility had duration less than 3 years (Table 3).

Analysis of 36-item Medical Outcomes Study Short-Form Health Survey

Comparison between patients and controls regarding 36-item Medical Outcomes Study Short-Form Health Survey domains

When comparing between patients and controls regarding domains of SF-36, there was a significant difference in the following variables: role limitations owing to emotional health, energy/fatigue, emotional well-being, social functioning, and general health (P < 0.001), where controls significantly scored higher rates, indicating a better HRQOL (Table 4).

Correlation between 36-item Medical Outcomes Study Short-Form Health Survey with age and duration of infertility

There were strong negative correlations between some SF-36 domains and both age and duration of infertility.

Regarding patients' age, older age was found to be a significant predictor of poor physical HRQOL but not for social or emotional HRQOL. Nevertheless, prolonged duration of infertility was associated with lower scores of physical functioning, energy/fatigue (vitality), pain, and general health domains (Table 5, Figs. 1–3).

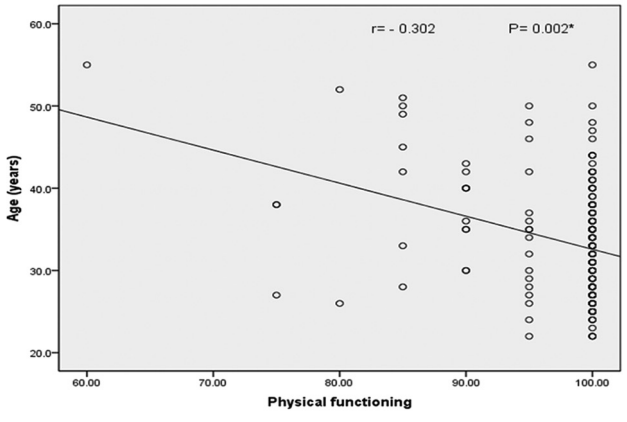
Relation between educational level and 36-item Medical Outcomes Study Short-Form Health Survey

Illiterate patients had lower scores in physical functioning, role physical, and pain domains when compared with those who had higher level of education, indicating significant lower level of HRQOL regarding those mentioned domains (Table 6).

Relation between type of infertility and 36-item Medical Outcomes Study Short-Form Health Survey

There was no significant effect on any of the eight domains of SF-36, indicating that infertility type was not a significant predictor of poor or good HRQOL (Table 7).

Figure 1



Correlation between age of patients and physical functioning domain.

Table 1 Sociodemographic characteristics of the studied groups

	Patients (n=100) [n (%)]	Control (n=100) [n (%)]	P
Age (years)			
<30	34 (34.0)	33 (33.0)	0.424
30-35	29 (29.0)	37 (37.0)	
>35	37 (37.0)	30 (30.0)	
Mean±SD	33.50±7.24	33.44±6.61	0.873
Residence			
Urban	40 (40.0)	37 (37.0)	0.663
Rural	60 (60.0)	63 (63.0)	
Education			
Illiterate	24 (24.0)	15 (15.0)	0.230
Basic education	21 (21.0)	19 (19.0)	
Secondary	46 (46.0)	50 (50.0)	
University	9 (9.0)	16 (16.0)	
Occupation			
Employee	25 (25.0)	34 (34.0)	0.369
Skilled worker	11 (11.0)	14 (14.0)	
Unskilled worker	43 (43.0)	33 (33.0)	
Farmer	21 (21.0)	19 (19.0)	
Smoking			
Nonsmoker	40 (40.0)	45 (45.0)	0.474
Smoker	60 (60.0)	55 (55.0)	

Table 2 Type and duration of infertility

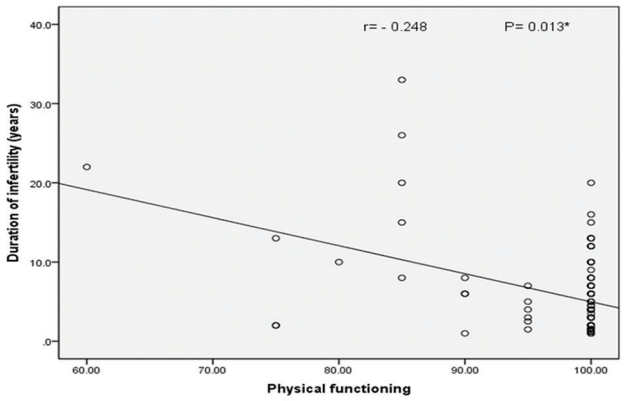
	n (%) (n=100)
Type of infertility	
Primary	72 (72.0)
Secondary	28 (28.0)
Duration of infertility (years)	
<3	35 (35.0)
3-6	33 (33.0)
>6	32 (32.0)
Mean±SD [median (range)]	5.98±5.73 [4.0 (1.0-33.0)]

Table 3 Duration of infertility in primary and secondary infertility

Duration of infertility (years)	Type of infertility [n (%)]	
	Primary	Secondary
<3	33 (45.8)*	6 (21.4)
3-6	15 (20.8)	14 (50.0)
>6	24 (33.3)	8 (28.6)
Mean±SD	5.85±5.39	6.29±6.65
Range	1-26	1-33

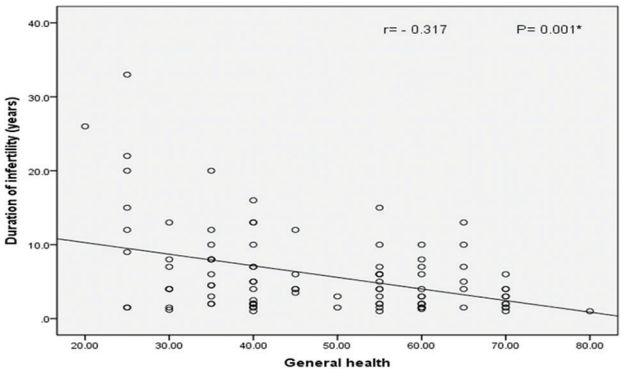
*P value=0.0104.

Figure 2



Correlation between duration of infertility and physical functioning.

Figure 3



Correlation between duration of infertility and general health domain.

Table 4 Comparison of 36-item Medical Outcomes Study Short-Form Health Survey scores between patients and controls

	Patients (*n*=100) Mean±SD	Controls (*n*=100) Mean±SD	*P*
Physical functioning	97.20±6.94	98.35±3.83	0.783
Role imitations owing to physical health	92.75±18.90	90.50±18.39	0.147
Role imitations owing to emotional health	39.33±37.72	81.33±27.76	0.000*
Energy/fatigue	50.65±12.32	66.65±12.89	0.000*
Emotional well-being	48.36±12.27	67.96±12.44	0.000*
Social functioning	78.25±16.25	90.88±9.54	0.000*
Pain	89.25±16.42	92.20±10.65	0.893
General health perception	47.45±14.62	62.70±11.69	0.000*

**P* value is less than 0.05

Logistic regression analysis for predictors of quality of life among studied patients

Multiple logistic regression analysis for risk factors of QOL was done and revealed that duration of infertility was the most important predictor for lower QOL among infertile men (Table 8).

Discussion

Infertility and undergoing fertility treatment exacerbate the intensity of stresses of the couple and negatively affect patients' QOL [21].

So, the present study aimed to evaluate the QOL using SF-36 questionnaire and to indicate what variables predict QOL in infertile men in Upper Egypt.

Based on the results obtained, infertile patients who participated in the present study had lower scores compared with the control group in five domains out of the eight domains concerning the QOL (role limitations owing to emotional health, energy/fatigue, emotional well-being, social functioning, and general health perception), indicating lower QOL regarding these domains.

The study of Kissi *et al.* [22], which used the SF-36, showed that men in the infertile group compared with men in the control group regarding the areas of social functioning, emotional role functioning, and emotional health had lower scores. This is in agreement with the results of the present study [22].

Moreover, in agreement with the present study, a study by Fekkes *et al.* [23] reported impairment in emotional behavior and social functioning domains and no substantial differences were found in physical functioning for infertile men compared with the general population. Another study by Shindel *et al.* [24] demonstrated also that male partners reported significantly lower standardized scores on the mental health subscale of the SF-36 scale.

According to the case–control study of Kheradmand *et al.* [25], infertile men had lower scores in six domains according to the SF-36 questionnaire [physical functioning, emotional role functioning, energy (vitality), emotional health, bodily pain, and health perception] when compared with the control group. On the contrary, the patient group had scored higher rates than the control group in social functioning and physical role functioning [25].

These results look somewhat inconsistent with the results of the present study, which showed affection of social and emotional health (no effect on physical health). This might be explained as people affected by infertility may carry a heavy emotional burden (as infertility treatment can be a long and difficult process with an uncertain outcome) [26]. This psychological experience, characterized by anxious waiting, doubts, and tension, is often considered by couples to be more distressing than the physical burden [27].

In a case–control study, Onta and Beji [28] investigated the effects of infertility on marital relations and QOL. They showed that the average score of QOL in the

Table 5 Correlation between 36-item Medical Outcomes Study Short-Form Health Survey with age and duration of infertility

	Age (years)		Duration of infertility (years)	
	r	*P*	*r*	*P*
Physical functioning	−0.302	0.002*	−0.248	0.013*
Role limitations due to physical health	−0.126	0.212	−0.017	0.868
Role limitations due to emotional health	0.024	0.811	−0.105	0.300
Energy/fatigue	−0.135	0.181	−0.278	0.005*
Emotional well being	0.051	0.613	−0.112	0.266
Social functioning	−0.019	0.854	−0.143	0.155
Pain	−0.222	0.027*	−0.202	0.044*
General health perception	−0.108	0.285	−0.317	0.001*

**P* value is less than 0.05

Table 6 Relation between educational level and 36-item Medical Outcomes Study Short-Form Health Survey among studied patients

	Education				*P*
	Illiterate Mean±SD	Basic education Mean±SD	Secondary Mean±SD	University Mean±SD	
Physical functioning	92.29±10.93	99.52±1.50	98.37±5.06	98.89±2.20	0.008*
Role limitations owing to physical health	80.21±31.26	96.43±11.95	96.20±10.50	100.00±0.00	0.010*
Role limitations owing to emotional health	30.56±32.48	49.21±38.90	42.03±39.40	25.93±36.43	0.259
Energy/fatigue	46.46±9.83	52.86±11.13	53.15±13.22	43.89±12.44	0.088
Emotional well-being	45.67±10.61	47.43±12.60	50.78±12.87	45.33±12.00	0.351
Social functioning	72.92±14.12	80.36±20.38	79.62±15.67	80.56±12.67	0.322
Pain	80.63±19.13	91.43±15.88	91.09±15.20	97.78±4.41	0.014*
General health perception	40.42±14.44	49.52±16.65	50.33±13.56	46.67±10.61	0.053

**P* value is less than 0.05

Table 7 Relation between type of infertility and 36-item Medical Outcomes Study Short-Form Health Survey among studied patients

	Type of infertility		*P*
	Primary Mean±SD	Secondary Mean±SD	
Physical functioning	98.06±5.41	95.00±9.62	0.054
Role limitations owing to physical health	93.75±16.65	90.18±23.90	0.760
Role limitations owing to emotional health	36.57±38.01	46.43±36.67	0.194
Energy/fatigue	50.83±12.10	50.18±13.09	0.843
Emotional well-being	47.11±12.07	51.57±12.43	0.124
Social functioning	77.26±16.70	80.80±15.02	0.284
Pain	89.51±16.30	88.57±17.02	0.773
General health perception	46.46±14.86	50.00±13.94	0.292

Table 8 Logistic regression analysis for predictors of quality of life among studied patients

	P	OR	95% CI	
			Lower	Upper
Age	0.658	0.977	0.881	1.083
Lower grades of education	0.089	2.305	0.881	6.027
Duration of infertility (years)	0.046*	1.136	1.017	1.295
Primary infertility	0.393	1.705	0.501	5.808

CI, confidence interval.

infertile group was higher than that of the fertile one in all domains except for social domain. These findings were in contradiction to our study. This might be owing to the great variation in social and economic status among comparative studied groups. Moreover, in developing countries, assisted reproduction often is only available to persons with more financial resources, with more burden to patients with low economic status [29].

In Egypt, some studies had discussed QOL in infertile females. However, to the best of our knowledge, no available research studies had studied QOL in infertile men.

Factors predicting QOL may vary in different infertile populations, sex, and ethnic backgrounds. Thus, identification of factors associated with better or worse QOL is vital to propose and test scientifically based interventions for infertile populations [30].

So, to complete the goal of our study, we tried to detect which variables (factors) can be associated with good or poor HRQOL in men experiencing infertility. In the present study, these factors included age of patient, education level, type of infertility, and its duration. Our study found that QOL scores were negatively affected by increasing patient's age and prolonged duration of infertility. Moreover, lower educational status had adverse effect on QOL. Nevertheless, duration of infertility was an important risk factor for lower QOL.

Type of infertility was not a significant predictor of poor or good QOL which looks to be somewhat a strange finding. This may be explained by the relatively

short duration of infertility in both types of infertility, especially those with primary infertility [33 (45.8%) of 72 patients had infertility for 3 years or less]. So, nearly most of patients with primary infertility may be considered in the beginning of their marital life, which may be associated with less distress felt about infertility, less societal pressures from the surroundings to have a child, and more hope of successful treatment and pregnancy. This might explain the absence of difference in QOL between patients with primary and secondary infertility.

Some studies had also explored the predictors of QOL in infertile men. They had showed that educational level, age, marital relationship, previous IVF attempts, and duration of infertility were associated with lower scores of QOL [23,31,32].

Teskereci and Oncel [33] concluded that the QOL was reduced by variables such as advanced age, low education level, unemployment status, lower income, and long duration of infertility.

According to the study by Keramat *et al*. [34] who assessed QOL and its related factors in infertile couples, self-esteem score in individuals with long durations of infertility was found to be lower. Moreover, higher educational level, higher monthly income, living in urban area, shorter duration of marriage and infertility, and male sex were associated with better QOL status in most components [34].

The study by Kissi *et al*. [22] found that no correlations were found between infertility-related parameters used (patient's age, duration of infertility, delay of first consultation, and number of care structures accessed) and measures of QOL in infertile men.

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Conflicts of interest
There are no conflicts of interest.

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