Review Article

Assessment of Questionnaires Measuring Quality of Life in Infertile Couples: A Systematic Review

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Abstract

Background: Infertility has potentially inappropriate effects on quality of life in infertile couples. Various general and specific questionnaires have been structured for assessing different aspects of quality of life in infertile men, women, or couples. The present systematic review was designed to assess these questionnaires and also identify different factors affecting infertile couples based on the aforesaid questionnaires.
Methods: The research strategy involved general and specific terms in relation to couples's infertility and their quality of life. A review was done for studies published from 1982 to 2012 that were indexed in Medline, ISI Web of Science and Scopus as well as abstract books on this subject. We also corresponded with the authors of the references in related studies for introducing more resources and references.
Results: In all reviewed studies, different aspects of the quality of life in couples were evaluated including sexual, psychological, social, communicational, environmental, occupational, medical, as well as economical ones. In total, after initial screening of all studies, 10 general and 2 specific questionnaires were retrieved. Although no meta-analysis was found in the review, infertility had a negative effect on quality of life in couples.
Conclusion: This study revealed that some general questionnaires such as SF-36 and WHO-QOL were mostly used for assessing quality of life in infertile couples and some specific questionnaires such as FERTI-QoL and Fertility Problem Inventory were rarely used. Thus, it seems that the evaluation of quality of life in infertile couples needs valid instruments for measurement.

Keywords: Assessment, Couples, Infertility, Quality of life, Questionnaire.
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Introduction

Infertility is usually defined as the failure of a couple to conceive after trying to do so for at least one full year (1). Moreover, according to the definition introduced by the World Health Organization, quality of life is defined as "individuals' 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" (2). It is a broad-ranging concept affected in a complex way by the person's physical health (3), psychological statements (4), levels of independence (5), social constraints (6), personal beliefs (7) and characteristics and also their relationship to salient features of

their environment (8).

Health-related quality of life is a multi-dimensional concept that includes domains related to physical, mental, emotional and social aspects related to a disease or its specific therapeutic approaches (4). It can be also considered as a life crisis, identity crisis and a chronic illness, as well as combinations of these aspects (5). Infertility with its complex treatments and various types of stresses may be manifested by a chronic physical illness (6). Most infertile individuals experience stress and tension and are less satisfied with their lives than their fertile counterparts (7). Infertility has adverse effects on mental, communicational, and sexual health in these couples (8). Besides, infertility and its identified treatment protocols may have negative effects on the quality of life of infertile couples (9-11). Due to the nature of infertility, attention to the quality of life in these couples has equal importance to different treatment programs (12).

Quality of life can be assessed by both general and specific tools employed for specific conditions (13). These tools have a wide range of applications that can be used in different situations (14). General tools have generally no questions for specific conditions and diseases. However, specific tools with the same statements include some certain questions for these conditions (13) and thus the use of the latter questionnaires is preferable. Formerly, general tools were used for assessing quality of life in infertile couples (15). Besides, specific tools were of higher sensitivity when used in certain individual groups (16, 14). However, some observers use both types of tools concurrently for assessing quality of life (14).

In this study we tried to 1) identify standard and valid general and specific instruments for assessing quality of life in infertile couples; 2) provide valid and reliable information on the quality of life of these couples; 3) describe the tools used in this field; and 4) perform a systematic review on the tools used for assessing quality of life in infertile couples. In this review we determined different componential factors on quality of life in infertile couples (Table 1).

Methods

This systematic review was performed in 2012 reviewing all studies published from 1982 to 2012 and indexed in Medline, ISI Web of knowledge and Scopus, as well as abstract books on this subject, regardless of the type of study, its publication status, language, sex of individuals, or treatment protocols. We also corresponded with the authors of cited references for more resources and references.

The research strategy involved general and specific terms in relation to couples' infertility and their quality of life including "quality of life", "questionnaire", "scale", "inventory", "infertility" and "sterility".

Table 1. Different componential factors on quality of life in infertile couples in the literates

Components	Authors
Sexual dimension	Shindel (32), Baczkowski (19), Elia (20), Drosdzol (9, 36), Hassanian (47), OhI (26), Chachamovic (48), Smith (22), Shindel (2008), Valsankar (34), Marketed (21), Monga (49)
Mental dimension	Lowyck (50), Marketed (21), Peterson (43), Hermann (45), Khayata (51), Aart (52, 53), Chachamovic (54), Baghianimoghadam (55), Olga (56), Lau (57), Moura-Ramos (58)
Social dimension	Lau (57), Amanati (40), Obeisat (59), Moura-Ramos (58)
Communicational dimension	Lau (57), Obeisat (59)
Occupational and environmental dimensions	Bolsoy (60)
Marital dimension	Peterson (61), Marketed (21), Valsankar (34), Monga (49), Onat (62), Obeisat (59)
The partner's understanding of the quality of life for his wife	Chachamovic (15)
Medical dimension	Peterson (61), Chachamovic (48),
Economical dimension	Ragni (63), Elmessidi (64), Johannson (65), Leturkonirsch (66), Goldschmidt (67), KarLidere (33), Lau (57)
Age	Fekkes (41), Aart (52), Choobforoushzadeh (44)
Duration of infertility	Choobforoushzadeh (44)
Educational level	Choobforoushzadeh (44) , Chachamovic (48)
Sex	Chachamovic (48), Fekkes (11), Baghianimoghadam (55), Anderws (68), Johansson (65)

The main inclusion criteria were: 1) assessment of quality of life multi-dimensionally using general or specific questionnaires (studies with focus on only one statement of quality of life were excluded); and 2) use of standard questionnaires assessing psychometric characteristics (some tools, such as Visual Analogue Scale, were not included) (17). All procedures were performed by two independent researchers who did the research and any disagreement between them was evaluated by, first, interviewing them and then by getting feedback from a third person. The abstracts and the full texts of the papers were primarily reviewed for rejection or acceptance. Afterwards, the full texts of the accepted papers were critically appraised and the needed data were extracted. The authors' names and those of the journals and also the results were concealed from the researchers.

For identifying instruments used for quality of life measurements, we used the Medical Outcomes Trust (18) that includes a set of the following attributes and criteria: 1) Conceptual and measurement models; 2) Reliability; 3) Validity; 4) Responsiveness; 5) Interpretability; 6) Respondent and administrative burden; 7) Alternative forms, and 8) Cultural and language adaptations (translations). In this study, we used the first criterion for assessing the questionnaires.

Various general and specific questionnaires have been tailored for assessing different aspects of quality of life in infertile men, women, or couples. The questionnaires have been presented in tables 2 and 3.

Results

Among 4064 studies obtained from physical and electronic resources, 63 studies were repetitive and 3334 were also excluded after reviewing their abstracts or full texts due to their irrelevance to the subject of the study. In total, 52studies were reviewed and analyzed.

After initial assessment and comparison of the results, we categorized the papers based on the following criteria: a) Design, re-evaluation, standardization and localization of questionnaire; b) Quantitative assessment of the quality of life in infertile couples in different cultures and races; c) Assessment of quality of life in patients undertreatment and evaluation of the effects of therapeutic interventions on the improvement of quality of life; d) Assessment of the impact of psychological interventions on the quality of life in infertile couples; and e) Self-administered questionnaire design. The frequency of the published studies on the quality of life in infertile couples in different nations were as follows: the United States (12 studies), Nederlands (8 studies), Iran (6 studies), Turkey (6 studies), Canada (5 studies), and the United Kingdom, Australia, and India (2 studies each). In each of the following countries, including Belgium, Egypt, Emirates, Portugal, France, Hong Kong, Sweden, Greece, and New Zealand only one study had been published on the subject.

The instruments that are frequently used for the assessment of quality of life in infertile couples are as follows:

SF-36: This is a general instrument that is commonly used for the assessment of quality of life and its reliability and validity have been documented worldwide. This questionnaire had been used nine times for assessing quality of life and its determinants in infertile couples. Ragni showed that the duration of infertility and history of previous treatment for infertility could negatively affect quality of life compared to that of the general population, while its subjective health profile was not different from the others (63). Chachamovic et al., showed associations between previous IVF and reduced vitality and mental health, between history of genital surgery and reduced general health, between educational level and increased vitality and mental health, between sexual dysfunction and reduced total quality of life score, as well as between advanced age and increased general health and physical function (48). In another study by this author in 2010, even mild levels of depression and anxiety were introduced as the main determinants of quality of life that could be more effective than demographic, social, or clinical factors (10). Drosdzol believed that all statements of quality of life in infertile couples were considerably lower than those of the fertile ones (9). Shindel and his colleagues showed that infertile men suffered from moderate to severe depression and had reduced scores of mental health (32). Furthermore, by using a multivariable regression model, Rashidi indicated that female gender and low educational levels were the main indicators for a low quality of life score, but duration of infertility and its etiologies did not influence the quality of life (69). The total number of citatioins to papers that used SF-36 questionnaire for assessing QoL in infertile couples was 128.

Table 2. The general and specific instruments for assessing quality of life in infertile couples

Imension	Item	Feature	Study	Instrument	No. of Citations
*Physical functioning *vitality /energy *physical role limitation *Bodily pain *Mental health *Change in health * Emotional role limitation *Health perception *Social functioning	36	Generic	Ragni (2005), (63) Chachamovic (2007), (48) Nelson (2008), (30) Drosdzol (2008), (9) Rashidi (2008), (69) Shindel (2008), (32) Chachamovic (2010), (54)	SF-36	25 15 27 9 18 34 0
*General health * Physical health *Psychological health *Social relationship *Environment	26	Generic	Chachamovic (2007), (48) Bolsoy (2010), (60) Chachamovic (2010), (54) Hermann (2011), (45) Choobforoshzadeh (2011), (44)	WHOQOL-BREF	13 2 0 1 0
All aspects of quality of life	12	Generic	Carter (2011), (23), Fisher (2010), (37)	SF-12	9,11
*Somatic symptoms *Anxiety/insomnia *Social dysfunction *Depression	28	Generic	van den Akker (2005), (56) Baghianimoghadam (2011), (55)	GHQ-28	26 0
*Social and self-care activities *Physical activity *Mobility	65	Generic	Monga (2004), (49)	Quality of wellbeing scale	80
* Marital satisfaction *Personality issues *Communication *Conflict resolution *Financial management *Leisure activities *Sexual relationship *Children and parenting *Family and friends *Equalitarian roles *Religious orientation *Marital cohesion *Marital change	125	Generic	Kehua wang (2006), (70) Sydsjo (2011), (71) Moura-Ramos (2011), (72) Gamerio (2011), (73)	Enrich Inventory	21 1 3 0
*Physical *Role *Cognitive *Emotional *Social	30		Hassanian (2010), (47)	QLQ (C30-version2)	4
*Functioning *Socio-economic *Psychological/spiritual family	64	Generic	van den Akker (2005), (56)	Quality of life Index	26
*Somatization *Obsessive-compulsive *Interpersonal sensivity *Paranoid ideation *Anxiety *Depression *Psychoticisim *Phobia *Aggression	90		Fekkes (2003), (41) Wang (2006), (70)	The Hopkines Symptom checklist (SCL-90-R)	37 21
*Emotional *Behavior	136	Generic	Fekkes (2003), (41)	Impact profile the sickness	37
*Social concern *Relationship concern *Sexual concern *Rejection of child-free lifestyle	46	Specific For infertility	Peterson (2003), (61) Lowyck (2009), (50) Peterson (2011), (43) Moura-Ramos (2011), (72)	Fertility problem Inventory(FpI)	39 5
*Emotional *Relational *Mind/Body *Social *Environment * Tolerability treatment	36	Specific For infertility	Aarts (2011), (52) Valsankar (2011), (34) Boivin (2011), (75)	fertiQOL	8 5

Table 3. Other tools applied in relation to the study target groups

Instrument	Study
Marital adjustment, Lock-wallace marital adjustment test , Brief index of sexual functioning, IIEF	Monga (2004), (49)
TLMK	Schanz (2005), (76)
The multidimensional coping inventory	Van Den Akker (2005), (56)
Female sexual function index, International index of erectile function, Relationship quality scale	Shindel (2008),(32)
Beck depression inventory	Chachamovic (2009, 2010), (54, 77)
Visual analogue scale	Hassanian (2010), (47)
Sense of coherence (SOC), Psychological general wellbeing (PGWB), Beck depression Inventory, FSFI	Johansson (2010), (65)
Impact of event scale, FSFI, Center for Epidemiologic studies depression scale, Abbreviated dyadic adjustment scale (ADAS), Menopausal symptom checklist.	Keskin (2011), (24)
Resilience scale	Hermann (2011), (45)
Hospital anxiety and depression scale (HADS), Reproductive concerns scale (Rcs)	Carter (2011), (23)
The brief symptom inventory	Moura-Ramos (2011), (72)
Social desirability scale, Marlowe- Crowne social desirability scale, HADS	Peng (2011), (78)
Dyadic adjustment scale, Sexual functioning questionnaire	Valsankar (2011), (34)
IIEF, FSFI	Drosdzol (2008, 2012), (9)
Patient centeredness questionnaire (PCQ), HADS	Art (2011, 2012), (52, 53)

WHOQoL-BREF: International tools for the assessment of quality of life vary in different populations and cultures and the individuals' understanding of quality of life is specifically related to their cultural contents. For assessing quality of life in infertile couples, Bolsoy et al. used WHOQoL-BREF questionnaire and found that infertile women had a higher score than infertile men. They also showed that the quality of life was adversely associated with physical health and social function in unemployed men (60). Using this tool, Chachamovic et al believed that the agreement on understanding of quality of life by spouses was the most important factor in reducing the interference of opinions of other family members on the infertile couple's life. According to his viewpoints, the effect of depression on the quality of life is mild and the impact of gender as a determinant factor is unimportant (15). Moreover, Choobforoshzadeh showed significant negative associations between quality of life and factors of advanced age and infertility duration as well as a direct association between quality of life and educational level (44). Hermann believed that previous history of IVF was related to a reduced psychological component score and history of genital surgery and low educational level were both related to reduced environmental component scores; however, moderate educational level was related to increased scores of social network, he concluded (45). The total number of citations to these papers was 16.

QLQ- C30 (version 2.0): By using this tool Hassanian et al., showed that primary infertility was the main cause of decreased sexual function and quality of life and sexual function could gradually decrease within four to six years after infertility (47).

SF-12: In a study by Carter, the mental component scale in infertile women was estimated to be lower than the optimal level. It was also shown that fertility was a main factor and a major target giving meaning to life (23). On the other hand, infertility had a negative impact on QoL because of the effect of stress. Fisher showed better general physical function in infertile men compared with the normal population, while their mental health was lower (37). Number of citations to papers using this instrument was 20.

GHQ-28: By using GHQ-28, Baghiani Moghadam reported that the general health of infertile women was significantly lower than men. Infertility evidently had effects on infertile couples' health, particularly in women and they suffered from greater physical signs, social problems, and more severe depression (55). Number of citations was 26.

Enrich Inventory: Moura-Ramos re-evaluated the factor structure of fertility problem inventory by

this tool (72). Kehuawang also found that some factors such as age, annual income, infertility duration, and history of unsuccessful treatment regimens had negative associations with quality of life (70). Gameiro observed that some couples who conceived by assisted reproductive techniques were generally satisfied with their relationships and it led to the improvement of all aspects of their quality of life (73). Twenty-five papers cited this study.

Quality of Well-being Scale: In this questionnaire, quality of life in infertile women was reported to be lower than that of men and the former group had lower marriage compatibility compared to the normal population (49). Eighty papers citied this article.

Fertility Problem Inventory: According to the viewpoint of Lowyck, there was an adverse association between self-criticism, dependency and psychological health, as well as a positive association between self-criticism, and sexual and communicational statements in infertile couples (50). In another study, Peterson showed higher levels of depression and anxiety in women compared with men prior to infertility treatment; however, after a year of follow-up and repeated treatment schedules, infertility-related anxiety, social stress, and psychological stress were considerably reduced. This improvement was also observed in men (43). Ramos also suggested that the use of this tool is strongly recommendable because of its capability for the assessment of various aspects of infertility in infertile couples (72). The total number of citations to this paper was 44.

FertiQoL: Aart et al. used this tool and found a negative relationship between depression and anxiety and the total mean score of FertiQoL questionnaire. According to his findings, FertiQoL is a reliable tool in infertile women and its use could facilitate continuation of appropriate therapeutic approaches. Moreover, he believed that attention to the clients state of depression and anxiety was necessary for improving quality of life and recommended identification of the causative relationship between anxiety and quality of life (52). Moreover, according to the observations of Boivin (75), Valsankar found that the quality of life of infertile women was considerably low and thus infertility had deleterious effects on sexual function and marital compatibility (34). Thirteen papers cited this article.

The Effects of Infertility on Sexual Dysfunction: In different studies, infertility affected the couples' sexual relationship and, particularly, in the context of sexual behavior it had an inhibitory effect on infertility treatment (19–21). Nevertheless, some authors have shown that both infertility treatment and its durations had no effect on sexual behavior (19, 21). In a study by Smith and his colleagues, infertility due to men-related causes affected both personal and sexual behaviors and infertile men were more prone to suffer from low quality of life and high social pressure (22). Carter studied the negative effects of infertility on women's sexual function and showed concomitant deleterious effects of stress due to infertility on the quality of life in those undergoing IVF (23). Keskin showed higher rates of sexual dysfunction in secondary infertility and concluded that eroticism, orgasm, and sexual satisfaction decreased more significantly in the former group (24). The prevalence of erectile dysfunction was higher in infertile men compared with normal controls (25). Ohi believed that regardless of the lower pleasure and desire, infertile couples had an appropriate sexual relationship and thus they supported each other well. In a study on a sample of Taiwanese, Lee found lower sexual behavior among infertile women with high distress, as well as low self-assurance (27). Leiblum also demonstrated a negative relation between infertility and sexual behavior (28). Millheiser also showed that infertile women had lower levels of sexual satisfaction in comparison with normal controls and recommended for further studies on sexual dysfunction due to infertility (29). In Nelson et al.'s study, women suffered greater depression and sexual dysfunction and sexual dysfunction was believed to occur simultaneously in both men and women (30). Oskay also reported higher overall prevalence of sexual dysfunction in infertile women in comparison to men and this abnormality was associated with advanced age, duration of infertility, and sex frequency (31). The prevalence of ejaculatory dysfunction in the study by Shindel was higher in infertile men than their fertile counterparts and, therefore, it could negatively affect sexual function between the genders and women got frustrated (32).

Karlidere demonstrated that infertile women had more social support, but had concurrently higher stresses, while infertile men suffered from higher sexual dysfunction (33). In Valsankar's study, infertility had an effect on marital compatibility and sexual function (34) but contrarily, Gulcan Gulec found no difference in sexual function between

the infertile and the control groups (35). Drodsdzol found sexual dysfunction to be more severe in older men and men with lower educational levels (9). In addition, he showed that sexual dissatisfaction was associated with female gender, the age greater than 30 years, lower educational levels, male infertility, and infertility duration (36). Finally, Fisher showed similar levels of infertility-related stress among infertile men and women (37).

Discussion

Systematic review studies on decreased quality of life has clearly shown that infertility is a certain cause of psychological and mental disturbance in infertile couples. This feature has also been demonstrated in some qualitative studies (38, 39). One of the main findings of the present study was the application of some specifically structured tools for the assessment of quality of life in infertile couples. Furthermore, the use of these tools has gradually increased since 2003. In our review, only 9 studies had used specific tools for this purpose and general questionnaires had been applied in other studies.

Using SF-36 questionnaire, quality of life is estimated to be better in infertile men compared with women. The main difference in this discrepancy between genders is related to the components of social functioning and mental health.

Using WHOQoL–BREF questionnaire, researchers showed that, life without children was associated with less satisfaction in both physical and psychological statements and deterioration of sexual life might result in reduced total quality of life scores. Utilizing the SF-12 questionaire, fertility had positive effects on quality of life. Using Enrich Inventory, marital relationship among infertile couples was assessed to be good. Moreover, fertility Problem Inventory proved to be a reliable and valid instrument for assessing different aspects of stress in infertile couples. FertiQoL is a valid tool for the evaluation of infertility problems and its treatment effects, although more investigations on the validity of this tool for use in different cultures and nations has been recommended.

However, Montazeri et al. performed a mini-review on this subject (12). One of the main aspects of the quality of life in these couples was adverse association of infertility with irrational parenthood cognitions. Thus, the patients with higher levels of irrational parenthood cognitions suffered more from suboptimal quality of life. Therefore, cognitive consultation is necessary for this population.

The main predicting factors of quality of life in infertile couples are different in various populations because of the differences in age range, gender distribution, duration of infertility, as well as social and occupational variables. Thus, identifying these related indicators can help to improve the quality of life of these couples through planning psychological consultations and practical interventions.

Conclusion

In the current study, we found a direct relationship between psychological health and sexual satisfaction. Common supportive psychological interventions in infertile couples include acceptance, commitment (43), cognitive behavior (44, 45), resilience (45), and well-being therapies (46). In this regard, to impart a holistic treatment in infertility, effective counseling and reassurance to reduce the impact of the condition on marital and sexual life are needed (34).

Finally, more studies should be performed to target the different aspects of quality of life in infertile couples, particularly by using specific standard tools and questionnaires in various populations with different cultures and customs.

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Conflict of Interest

The authors declare no conflict of interest.

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