

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

Seyyed Abbas Mousavi¹, Seyyedeh Zahra Masoumi², Afsaneh Keramat^{3*}, Jalal Pooralajal⁴, Fatemeh Shobeiri⁵

1- Golestan Research Center of Psychiatry, Golestan University of Medical Sciences, Gorgan, Iran

2- Student Research Committee, School of Nursing and Midwifery, Shahrood University of Medical Sciences, Shahrood, Iran

3- Center for Health-Related Social and Behavioral Sciences Research, Shahrood University of Medical Sciences, Shahrood, Iran

4- Research Center for Modeling of Non-Communicable Diseases, School of Public Health, Hamadan University of Medical Sciences, Hamadan, Iran

5- Mother and Child Care Research Center, Hamadan University of Medical Sciences, Hamadan, Iran

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' 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.

To cite this article: Mousavi SA, Masoumi SZ, Keramat A, Pooralajal J, Shobeiri F. Assessment of Questionnaires Measuring Quality of Life in Infertile Couples: A Systematic Review. *J Reprod Infertil.* 2013;14(3):110-119.

* Corresponding Author:

Afsaneh Keramat, Department of Reproductive Health, Shahrood University of Medical Sciences, Shahrood, Iran

E-mail:

keramat1@yahoo.com

Received: Apr. 6, 2013

Accepted: Jun. 16, 2013

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), Johansson (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, 52 studies 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), Netherlands (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 citations 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			Ragni (2005), (63)		25
*vitality /energy			Chachamovic (2007), (48)		15
*physical role limitation			Nelson (2008), (30)		27
*Bodily pain			Drosdzol (2008), (9)	SF-36	9
*Mental health	36	Generic	Rashidi (2008), (69)		18
*Change in health			Shindel (2008), (32)		34
* Emotional role limitation			Chachamovic (2010), (54)		0
*Health perception					
*Social functioning					
*General health			Chachamovic (2007), (48)		13
* Physical health			Bolsoy (2010), (60)		2
*Psychological health	26	Generic	Chachamovic (2010), (54)	WHOQOL-BREF	0
*Social relationship			Hermann (2011), (45)		1
*Environment			Choobforoshzadeh (2011), (44)		0
All aspects of quality of life	12	Generic	Carter (2011), (23), Fisher (2010), (37)	SF-12	9,11
*Somatic symptoms					
*Anxiety/insomnia	28	Generic	van den Akker (2005), (56)	GHQ-28	26
*Social dysfunction			Baghianimoghadam (2011), (55)		0
*Depression					
*Social and self-care activities				Quality of wellbeing scale	80
*Physical activity	65	Generic	Monga (2004), (49)		
*Mobility					
* Marital satisfaction					
*Personality issues					
*Communication					
*Conflict resolution					
*Financial management					
*Leisure activities	125	Generic	Kehua wang (2006), (70)	Enrich Inventory	21
*Sexual relationship			Sydsjo (2011), (71)		1
*Children and parenting			Moura-Ramos (2011), (72)		3
*Family and friends			Gamerio (2011), (73)		0
*Equalitarian roles					
*Religious orientation					
*Marital cohesion					
*Marital change					
*Physical					
*Role					
*Cognitive	30		Hassanian (2010), (47)	QLQ (C30-version2)	4
*Emotional					
*Social					
*Functioning					
*Socio-economic	64	Generic	van den Akker (2005), (56)	Quality of life Index	26
*Psychological/spiritual family					
*Somatization					
*Obsessive-compulsive					
*Interpersonal sensivity					
*Paranoid ideation					
*Anxiety	90		Fekkes (2003), (41)	The Hopkines Symptom checklist (SCL-90-R)	37
*Depression			Wang (2006), (70)		21
*Psychoticisim					
*Phobia					
*Aggression					
*Emotional					
*Behavior	136	Generic	Fekkes (2003), (41)	Impact profile the sickness	37
*Social concern					
*Relationship concern	46	Specific For infertility	Peterson (2003), (61)	Fertility problem Inventory(Fpl)	39
*Sexual concern			Lowyck (2009), (50)		5
*Rejection of child-free lifestyle			Peterson (2011), (43)		
			Moura-Ramos (2011), (72)		
*Emotional					
*Relational			Aarts (2011), (52)		8
*Mind/Body	36	Specific For infertility	Valsankar (2011), (34)	fertiQOL	
*Social			Boivin (2011), (75)		5
*Environment					
*Tolerability treatment					

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 cited 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). Drodzdzol 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 questionnaire, 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.

Acknowledgment

This article is a part of the PhD thesis supported by grant 9110 from Shahroud University of Medical Sciences Research Council. We would like to thank the vic-chancellor of education, as well as the vic-chancellor of research and technology of the University for their financial support to carry out the study.

Conflict of Interest

The authors declare no conflict of interest.

References

1. Benyamini Y, Gozlan M, Kokia E. Variability in the difficulties experienced by women undergoing infertility treatments. *Fertil Steril*. 2005;83(2):275-83.
2. WHO. The World Health Organization Quality of Life assessment (WHOQOL): position paper from the World Health Organization. *Soc Sci Med*. 1995; 41(10):1403-9.
3. Wang M, Schalock RL, Verdugo MA, Jenaro C. Examining the factor structure and hierarchical nature of the quality of life construct. *Am J Intellect Dev Disabil*. 2010;115(3):218-33.

4. Colwell HH, Mathias SD, Pasta DJ, Henning JM, Steege JF. A health-related quality-of-life instrument for symptomatic patients with endometriosis: a validation study. *Am J Obstet Gynecol.* 1998;179(1):47-55.
5. Diamond RK, Meyers M, Scharf CN, Weinshel M. *Couple Therapy for Infertility.* Edition 1. New York: The Guilford press; 1999. p. 53-59.
6. Kainz K. The role of the psychologist in the evaluation and treatment of infertility. *Womens Health Issues.* 2001;11(6):481-5.
7. Greil AL. Infertility and psychological distress: a critical review of the literature. *Soc Sci Med.* 1997;45(11):1679-704.
8. Andrews FM, Abbey A, Halman LJ. Is fertility-problem stress different? The dynamics of stress in fertile and infertile couples. *Fertil Steril.* 1992;57(6):1247-53.
9. Drosdzol A, Skrzypulec V. Quality of life and sexual functioning of Polish infertile couples. *Eur J Contracept Reprod Health Care.* 2008;13(3):271-81.
10. Chachamovich JR, Chachamovich E, Ezer H, Fleck MP, Knauth D, Passos EPJ. Investigating quality of life and health-related quality of life in infertility: a systematic review. *Psychosom Obstet Gynaecol.* 2010;31(2):101-10.
11. Fekkes M, Buitendijk SE, Verrips GH, Braat DD, Brewaeys AM, Dolfing JG, et al. Health-related quality of life in relation to gender and age in couples planning IVF treatment. *Hum Reprod.* 2003;18(7):1536-43.
12. Montazeri A. Infertility and health related quality of life: Minireview of the literature. *J Family Reprod Health.* 2007;1(2):55-8.
13. Luckett T, King M, Butow P, Friedlander M, Paris T. Assessing health-related quality of life in gynecologic oncology: a systematic review of questionnaires and their ability to detect clinically important differences and change. *Int J Gynecol Cancer.* 2010;20(4):664-84.
14. Wiebe S, Guyatt G, Weaver B, Matijevic S, Sidwell C. Comparative responsiveness of generic and specific quality-of-life instruments. *J Clin Epidemiol.* 2003;56(1):52-60.
15. Chachamovich JL, Chachamovich E, Ezer H, Cordova FP, Fleck MM, Knauth DR, et al. Psychological distress as predictor of quality of life in men experiencing infertility: a cross-sectional survey. *Reprod Health.* 2010;9:7:3.
16. Murawski MM, Miederhoff PA. On the generalizability of statistical expressions of health related quality of life instrument responsiveness: a data synthesis. *Qual Life Res.* 1998;7(1):11-22.
17. Jones GL, Hall JM, Balen AH, Ledger WL. Health-related quality of life measurement in women with polycystic ovary syndrome: a systematic review. *Hum Reprod Update.* 2008;14(1):15-25.
18. Scientific Advisory Committee of the Medical Outcomes Trust. Assessing health status and quality-of-life instruments: attributes and review criteria. *Qual Life Res.* 2002;11(3):193-205.
19. Reder F, Fernandez A, Ohl J. [Does sexuality still have a place for couples treated with assisted reproductive techniques?]. *J Gynecol Obstet Biol Reprod (Paris).* 2009;38(5):377-88. French.
20. Elia J, Delfino M, Imbrogno N, Mazzilli F. The impact of a diagnosis of couple subfertility on male sexual function. *J Endocrinol Invest.* 2010;33(2):74-6.
21. Markestad CL, Montgomery LM, Bartsch RA. Infertility and length of medical treatment effects on psychological, marital, and sexual functioning. *Int J Rehabil Health.* 1998;4(4):233-43.
22. Smith JF, Walsh TJ, Shindel AW, Turek PJ, Wing H, Pasch L, et al. Sexual, marital, and social impact of a man's perceived infertility diagnosis. *J Sex Med.* 2009;6(9):2505-15.
23. Carter J, Applegarth L, Josephs L, Grill E, Baser RE, Rosenwaks Z. A cross-sectional cohort study of infertile women awaiting oocyte donation: the emotional, sexual, and quality-of-life impact. *Fertil Steril.* 2011;95(2):711-6.
24. Keskin U, Coksuer H, Gungor S, Ercan CM, Karasahin KE, Baser I. Differences in prevalence of sexual dysfunction between primary and secondary infertile women. *Fertil Steril.* 2011;96(5):1213-7.
25. Khademi A, Alleyassin A, Amini M, Ghaemi M. Evaluation of sexual dysfunction prevalence in infertile couples. *J Sex Med.* 2008;5(6):1402-10.
26. Ohl J, Reder F, Fernandez A, Bettahar-Lebugle K, Rongières C, Nisand I. [Impact of infertility and assisted reproductive techniques on sexuality]. *Gynecol Obstet Fertil.* 2009;37(1):25-32. French.
27. Lee MS, Paek D, Eum KD, Siegrist J, Li J, Lee HE, et al. Paternal work stress and prolonged time to pregnancy. *Int Arch Occup Environ Health.* 2009;82(2):209-16.
28. Leiblum SR, Aviv A, Hamer R. Life after infertility treatment: a long-term investigation of marital and sexual function. *Hum Reprod.* 1998;13(12):3569-74.
29. Millheiser LS, Helmer AE, Quintero RB, Westphal LM, Milki AA, Lathi RB. Is infertility a risk factor for female sexual dysfunction? A case-control study. *Fertil Steril.* 2010;94(6):2022-5.

30. Nelson CJ, Shindel AW, Naughton CK, Ohebshalom M, Mulhall JP. Prevalence and predictors of sexual problems, relationship stress, and depression in female partners of infertile couples. *J Sex Med.* 2008;5(8):1907-14.
31. Oskay U, Beji N, Serdaroglu H. The issue of infertility and sexual function in Turkish women. *Sex Disabil.* 2010;28(2):71-9.
32. Shindel AW, Nelson CJ, Naughton CK, Ohebshalom M, Mulhall JP. Sexual function and quality of life in the male partner of infertile couples: prevalence and correlates of dysfunction. *J Urol.* 2008;179(3):1056-9.
33. Karlıdere T, Bozkurt A, Yetkin S, Doruk A, Sütçügil L, Nahit Ozmenler K, et al. [Is there gender difference in infertile couples with no axis one psychiatric disorder in context of emotional symptoms, social support and sexual function?]. *Turk Psikiyatri Derg.* 2007;18(4):311-22. Turkish.
34. Valsangkar S, Bodhare T, Bele S, Sai S. An evaluation of the effect of infertility on marital, sexual satisfaction indices and health-related quality of life in women. *J Hum Reprod Sci.* 2011;4(2):80-5.
35. Güleç G, Hassa H, Yalçın EG, Yenilmez C. The effects of infertility on sexual functions and dyadic adjustment in couples that present for infertility treatment. *Turk Psikiyatri Derg.* 2011;22(3):166-76. Turkish.
36. Drosdzol A, Skrzypulec V. Evaluation of marital and sexual interactions of Polish infertile couples. *J Sex Med.* 2009;6(12):3335-46.
37. Fisher JR, Baker GH, Hammarberg K. Long-term health, well-being, life satisfaction, and attitudes toward parenthood in men diagnosed as infertile: challenges to gender stereotypes and implications for practice. *Fertil Steril.* 2010;94(2):574-80.
38. Khodakarami N, Hashemi S, Seddigh S, Hamdiyeh M, Taheripanah R. Life Experience with Infertility; a Phenomenological Study. *J Reprod Infertil.* 2010;10(4):287-97.
39. Imeson M, McMurray A. Couples' experiences of infertility: a phenomenological study. *J Adv Nurs.* 1996;24(5):1014-22.
40. Amanati L, Allami M, Shokrabi S, Haghani H, Ramazanade F. Quality of life and influencing factors among infertile women. *Iran J Obstet Gynecol Infertil.* 2009;12(4):25-31.
41. Fekkes M, Buitendijk SE, Verrips GH, Braat DD, Brewaeys AM, Dolfing JG, et al. Health-related quality of life in relation to gender and age in couples planning IVF treatment. *Hum Reprod.* 2003;18(7):1536-43.
42. Ghasemzad A, Farzadi L. Quality of life and its correlates among a group of infertile Iranian women. *Med Sci Monit.* 2007;13(7):CR313-7.
43. Peterson BD, Eifert GH. Using acceptance and commitment therapy to treat infertility stress. *Cogn Behav Pract.* 2011;18:577-87.
44. Choobforoushade A, Kalantari M, Molavi H. The effectiveness of cognitive behavioral stress management therapy on quality of life in infertile women. *Iran J Obst Gynecol Infertil.* 2011;14(1):14-21.
45. Herrmann D, Scherg H, Verres R, von Hagens C, Strowitzki T, Wischmann T. Resilience in infertile couples acts as a protective factor against infertility-specific distress and impaired quality of life. *J Assist Reprod Genet.* 2011;28(11):1111-7.
46. Yazdi HZG, Sharbaf HA, Mousavifar N, Moeenizadeh M. The effectiveness of well-being therapy on stress, and psychological well-being in infertile women. *Iran J Obstet Gynecol Infertil.* 2012;15(2):49-56.
47. Hassanin IM, Abd-El-Raheem T, Shahin AY. Primary infertility and health-related quality of life in Upper Egypt. *Int J Gynaecol Obstet.* 2010;110(2):118-21.
48. Chachamovich JR, Chachamovich E, Zachia S, Knauth D, Passos EP. What variables predict generic and health-related quality of life in a sample of Brazilian women experiencing infertility? *Hum Reprod.* 2007;22(7):1946-52.
49. Monga M, Alexandrescu B, Katz SE, Stein M, Ganiats T. Impact of infertility on quality of life, marital adjustment, and sexual function. *Urology.* 2004;63(1):126-30.
50. Lowyck B, Luyten P, Corveleyn J, D'Hooghe T, Buyse E, Demyttenaere K. Well-being and relationship satisfaction of couples dealing with an in vitro fertilization/ intracytoplasmic sperm injection procedure: a multilevel approach on the role of self-criticism, dependency, and romantic attachment. *Fertil Steril.* 2009;91(2):387-94.
51. Khayata GM, Rizk DE, Hasan MY, Ghazal-Aswad S, Asaad MA. Factors influencing the quality of life of infertile women in United Arab Emirates. *Int J Gynaecol Obstet.* 2003;80(2):183-8.
52. Aarts JW, van Empel IW, Boivin J, Nelen WL, Kremer JA, Verhaak CM. Relationship between quality of life and distress in infertility: a validation study of the Dutch FertiQoL. *Hum Reprod.* 2011;26(5):1112-8.
53. Aarts JW, Huppelschoten AG, van Empel IW, Boivin J, Verhaak CM, Kremer JA, et al. How patient-centred care relates to patients' quality of life and distress: a study in 427 women experiencing infertility. *Hum Reprod.* 2012;27(2):488-95.

54. Chachamovich JR, Chachamovich E, Ezer H, Fleck MP, Knauth DR, Passos EP. Agreement on perceptions of quality of life in couples dealing with infertility. *J Obstet Gynecol Neonatal Nurs*. 2010;39(5):557-65.
55. Baghiani Moghadam MH, Aminian AH, Abdoli AM, Seighal N, Falahzadeh H, Ghasemi N. Evaluation of the general health of the infertile couples. *Iran J Reprod Med*. 2011;9(4):309-14.
56. van den Akker OB. Coping, quality of life and psychological symptoms in three groups of sub-fertile women. *Patient Educ Couns*. 2005;57(2):183-9.
57. Lau JT, Wang Q, Cheng Y, Kim JH, Yang X, Tsui HY. Infertility-related perceptions and responses and their associations with quality of life among rural chinese infertile couples. *J Sex Marital Ther*. 2008;34(3):248-67.
58. Moura-Ramos M, Gameiro S, Canavarro MC, Soares I, Santos TA. The indirect effect of contextual factors on the emotional distress of infertile couples. *Psychol Health*. 2012;27(5):533-49.
59. Obeisat S, Gharaibeh MK, Oweis A, Gharaibeh H. Adversities of being infertile: the experience of Jordanian women. *Fertil Steril*. 2012;98(2):444-9.
60. Bolsoy N, Taspinar A, Kavlak O, Sirin A. Differences in quality of life between infertile women and men in Turkey. *J Obstet Gynecol Neonatal Nurs*. 2010;39(2):191-8.
61. Peterson BD, Newton CR, Rosen KH. Examining congruence between partners' perceived infertility-related stress and its relationship to marital adjustment and depression in infertile couples. *Fam Process*. 2003;42(1):59-70.
62. Guliz O, Nezihe Kizilkaya B. Marital relationship and quality of life among couples with infertility. *Sex Disabil*. 2012;30:39-52.
63. Ragni G, Mosconi P, Baldini MP, Somigliana E, Vegetti W, Caliarì I, et al. Health-related quality of life and need for IVF in 1000 Italian infertile couples. *Hum Reprod*. 2005;20(5):1286-91.
64. El-Messidi A, Al-Fozan H, Lin Tan S, Farag R, Tulandi T. Effects of repeated treatment failure on the quality of life of couples with infertility. *J Obstet Gynaecol Can*. 2004;26(4):333-6.
65. Johansson M, Adolfsson A, Berg M, Francis J, Hogström L, Janson PO, et al. Quality of life for couples 4-5.5 years after unsuccessful IVF treatment. *Acta Obstet Gynecol Scand*. 2009;88(3):291-300.
66. Letur-Konirsch H, Grivel T, Weil E, Allaert FA, Audebert A. Evaluation of the quality of life in patients undergoing in vitro fertilization procedures. *Reprod Technol*. 2001;10(6):338.
67. Goldschmidt S, Braehler E. Influence of treatment outcome on the quality of life of the childless couple participating in in-vitro fertilization programs. *Z Klin Psychol Psychiatr Psychother*. 2001;49(2):197-220.
68. Andrews FM, Abbey A, Halman LJ. Stress from infertility, marriage factors, and subjective well-being of wives and husbands. *J Health Soc Behav*. 1991;32(3):238-53.
69. Rashidi B, Montazeri A, Ramezanzadeh F, Shariat M, Abedinia N, Ashrafi M. Health-related quality of life in infertile couples receiving IVF or ICSI treatment. *BMC Health Serv Res*. 2008;8(186).
70. Wang K, Li J, Zhang JX, Zhang L, Yu J, Jiang P. Psychological characteristics and marital quality of infertile women registered for in vitro fertilization-intracytoplasmic sperm injection in China. *Fertil Steril*. 2007;87(4):792-8.
71. Sydsjö G, Svanberg AS, Lampic C, Jablonowska B. Relationships in IVF couples 20 years after treatment. *Hum Reprod*. 2011;26(7):1836-42.
72. Moura-Ramos M, Gameiro S, Canavarro MC, Soares I. Assessing infertility stress: re-examining the factor structure of the Fertility Problem Inventory. *Hum Reprod*. 2012;27(2):496-505.
73. Gameiro S, Nazaré B, Fonseca A, Moura-Ramos M, Canavarro MC. Changes in marital congruence and quality of life across the transition to parenthood in couples who conceived spontaneously or with assisted reproductive technologies. *Fertil Steril*. 2011;96(6):1457-62.
74. Gourounti K, Anagnostopoulos F, Vaslamatzis G. Psychosocial predictors of infertility related stress: A review. *Curr Wom Health Rev*. 2010;6(4):318-31.
75. Boivin J, Takefman J, Braverman A. The fertility quality of life (FertiQoL) tool: development and general psychometric properties. *Hum Reprod*. 2011;26(8):2084-91.
76. Schanz S, Reimer T, Eichner M, Hautzinger M, Häfner HM, Fierlbeck G. Long-term life and partnership satisfaction in infertile patients: a 5-year longitudinal study. *Fertil Steril*. 2011;96(2):416-21.
77. Chachamovich J, Chachamovich E, Fleck MP, Cordova FP, Knauth D, Passos E. Congruence of quality of life among infertile men and women: findings from a couple-based study. *Hum Reprod*. 2009;24(9):2151-7.
78. Peng T, Coates R, Merriman G, Zhao Y, Maycock B. Testing the psychometric properties of Mandarin version of the fertility problem inventory (M-FPI) in an infertile Chinese sample. *J Psychosom Obstet Gynaecol*. 2011;32(4):173-81.