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Sexual function and quality of life in diabetic women referring to health care centers in Mashhad

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Abstract:

CONTEXT: Quality of life (QOL) is one of the important indexes of health and well-being promotion in the diabetic patients. Based on numerous studies, these patients have a lower QOL, compared to nondiabetic individuals. In addition, a higher prevalence of sexual function disorder has been reported in their population that can have a negative effect on their QOL.

AIMS: This study aimed to investigate the association between sexual function and QOL in diabetic women referring to health care centers in Mashhad during 2013–2014.

SETTINGS AND DESIGNS: In this correlational study, the association between sexual function and QOL in 90 diabetic women with type two diabetes referring to health care centers in Mashhad during 2013–2014 was investigated.

SUBJECTS AND METHODS: Data were collected by Rosen female sexual function index and short form-36 questionnaires.

STATISTICAL ANALYSIS USED: Data were analyzed by mean comparison and Spearman correlation coefficient statistical test through SPSS 16.

RESULTS: Subjects' mean sexual function score was 21.7 ± 6.30 . Based on the finding, 25.6% of the subjects suffered from sexual function disorder. Subjects' mean score of QOL was 58.75 ± 1616.24 . There was a significant association between an overall score of sexual function and its subscales, with their QOL and two dimensions of overall physical and psychological and mental health scores ($P < 0.005$).

CONCLUSIONS: Sexual function is one of the important and associated aspects of QOL in diabetic patients. Designing and evaluation of the interventions with the goal of an improvement in this variable plays a notable role in the promotion of these patients' QOL. However, with regard to limited research in this field, further studies on this association are suggested.

Keywords:

Diabetic women, quality of life, sexual function

Introduction

Quality of life (QOL) is a multidimensional concept that WHO defines it as individuals' perception of life, values, goals, standards, and personal desires.^[1,2] QOL, in fact, includes the individuals' cognitive, physical, spiritual, emotional, and social domains of an individual's life. With beginning of the 20's century, researchers, despite administration of preventive, and treatment interventions for the disease,

realized that QOL can be one of the important factors in the evaluation of social health and hygiene status.^[3] QOL is important as, if ignored, it can lead to hopelessness and lack of motivation for any attempt and reduction of social, economic, cultural, and healthy activities. From a deeper aspect, it can affect the socioeconomic development of a country.^[4] In recent 20 years, the interest in evaluation and improvement of patients' QOL, especially in chronic patient, has notably increased so that the improvement of their activities of daily living and QOL has turned to a goal. Most

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of the scholars consider QOL as the most important index in the evaluation of health and treatment care in these patients.^[5] In fact, the final goal of modern health cares in diabetic patients is not postponing the death but promotion of their health and QOL.^[6] An increased attention, paid to QOL in recent two decades, has led to researchers' field of work toward investigation and detection of its relevant effective factors. It is so that these factors can be modified leading to promotion of QOL, especially in chronic patients. Numerous factors possibly affect individuals' QOL.^[7,8] For instance, in some studies, the association between sexual function and QOL in women at fertility age has been reported. Women's sexual function is a part of their health that it can be impaired by a disorder in sexual desire and arousal, orgasm and dyspareunia that are common disorders all over the world in all cultures and ethnics.^[9-11] Individuals' sexual function and its related domains are affected by various variables, which can be categorized into the three majors groups of biological, psychological, and couples' related factors. Among the suggested biological factors in this context, vascular diseases (cardiovascular disease), neurological factors (head injury, epilepsies), medications (psychotropic drugs, antidepressants, alcohol and drugs), and endocrine causes (diabetes, hormonal changes especially testosterone).^[12-14]

Diabetes as one of the most common chronic diseases in all age and racial groups is among the suggested factors affecting individuals' sexual function.^[9,15] Prevalence of such a disease has an increasing pace due to a change in lifestyle and spread of obesity, so that in 2013, it affected 382 million adults aged 20–70 years. It is estimated that in 2030, this number will reach 439 million.^[16,17] In Iran, its prevalence increased from 7.7% in 2005 to 8.7% in 2007.^[15] This disease leaves disabling and life-threatening complications on the vital body organs such as neuropathy, ophthalmological complications, and cardiovascular and renal diseases.^[5,18] Several recent studies investigated the association between diabetes and sexual function in both genders.^[9,19,20] For instance Shi *et al.*, in a study on sexual function disorder in Chinese women with type two diabetes concluded that diabetic women's sexual function overall score was significantly lower in study group, compared to control group.^[19] Meta-analysis results of a study, conducted by Pontiroli *et al.* on 3168 diabetic women and 2823 subjects in the control group, showed a higher prevalence of sexual function disorder in diabetic women.^[21] Sexual function disorder has a sophisticated etiology in diabetic women. Causes such as vascular, neural, hormonal, and psychological changes are the suggested effective factors in this context.^[18,22] Meanwhile, Siddiqui *et al.*, in their literature review study, reported the dominant pathological effect of psychological factors on sexual function disorder in diabetic patients.^[18] High prevalence

of diabetes and its complications has attracted numerous researchers.^[23] In this regard, some of the studies on QOL and diabetic patients' health reported the negative effects of diabetes complications on diabetic patients.^[24-26] For instance, Kiadaliri *et al.*, in a systematic review study on diabetes in Iran, reported that the QOL of diabetic patients was lower than their healthy peers.^[15] In fact, diabetes, such as other chronic diseases, can lead to individuals' lowered QOL through causing physical, psychological, and social problems.^[27] Generally, most of the studies, separately investigating patients' QOL and their sexual function, reported an inappropriate condition in these two issues although their association is yet under question, and few studies have investigated them. For instance, Soltan Ahmadi *et al.* reported no significant association between type two diabetic women's QOL and their sexual dysfunction in Kerman, Iran.^[7] Meanwhile, the study of Enzlin *et al.*, on type one diabetic women in Belgium, reported a significant association between their sexual function and QOL.^[28] Therefore, with regard to limited and controversial existing studies in this context as well as the cultural differences, effective on QOL and sexual function in various countries, the present study aimed to investigate the association between sexual function and QOL in diabetic women referring to health care centers.

Subjects and Methods

This correlational study was conducted on 90 women referring to health care centers in Mashhad, Iran during 2013–2014. The minimum number of sample size was estimated by both formula associated with the correlational studies and a pilot study. Firstly, sexual function and QOL were investigated in 15 subjects, and then, the correlation coefficient between these two variables was calculated by Spearman correlation coefficient test. Correlation coefficient and critical values were used in a formula with a confidence interval of 95% and power of 80%, and the minimum sample size was calculated 79 subjects. With regard to the probable subjects' drop and to increase validity, the sample size was considered with 90 subjects. A selection of health centers was based on cluster sampling so that based on the population, covered by the health centers, and 10 health care centers from five districts of Mashhad were randomly selected. Next, a convenience sample was conducted among the qualified subjects. The subjects were selected from the women with diagnosed diabetes (fasting blood sugar >126 mg/dl and HbA1C >6.5 and sugar 2 h after a meal >180 mg/dl) who referred to the selected health care centers. The subjects meeting inclusion criteria, being explained by the research goal and signing the written consent form, received the research questionnaires to complete. Inclusion criteria were having literacy of reading and writing Persian, age between 18 and 60 years,

no addiction to alcohol and drugs among the subjects and their spouses, being married (at least six most after marriage), living with the spouse in the same house, and at least 1-year after development of type two diabetes. The subjects were left out of the study in case of their own or their spouses' involvement in other diagnosed diseases affecting their sexual activity such as cardiovascular and neurological diseases, traumas, and any surgeries on their reproductive system, serious physical defects, taking medications affecting sexual activity, consumption of contraceptives, spouses' treason, or the incidence of severe psychological crisis in the month prior to the study. Data collection tool was personal characteristics and disease related questionnaires female sexual function index and short form-36 (SF-36) QOL questionnaire.

Rosen female sexual function index (2000) contains 19 items with six subscales of sexual desire, sexual arousal, vaginal moisture, orgasm, dyspareunia, and sexual satisfaction, scored between 2 and 36. Higher scores of this scale show better sexual function and less pain.^[29]

SF-36 QOL questionnaire includes 36 items in eight domains of physical functioning and role limitation due to physical problems, role limitation due to emotional problem, bodily pain, social functioning, mental health, vitality, and general health, scored between 0 and 100. Higher scores show higher QOL.^[30]

The validity of the personal characteristics questionnaire was confirmed by content validity. Persian version of sexual function scale was approved by the study of Mohamadi *et al.* through content validity test.^[31] Persian version of SF-36 QOL questionnaire was confirmed by the Health Sciences Research Center of Kashan Jahad Daneshgahi unit.^[32] Reliability of the adopted questionnaires was confirmed after a pilot study, conducted on 20 subjects (Cronbach's alpha = 0.7). Collected data were analyzed by descriptive, independent *t*-test, Mann-Whitney, Kruskal-Wallis, and Spearman correlation coefficient tests through SPSS software 16 (SPSS Inc, Chicago, IL, USA). Significance level was considered $P < 0.05$ (confidence interval of 95%). Power was also considered 80%; therefore the difference less than $P < 0.05$ was reported significant.

Results

90 type two diabetic women with mean age of 43.58 ± 9.39 years were investigated in the present study. Subjects' age ranged between 19 and 60 years. Their mean body mass index (BMI) was 29.55 ± 7.93 (overweight). Their mean length of marriage was 25.13 ± 10.84 years and mean length of diabetes diagnosis was 5.58 ± 4.14 years [Table 1].

Table 1: Subjects' baseline characteristics

Variables	Mean±SD
Age (years)	43.58±9.39
Marriage (years)	25.13±10.84
Length of disease (years)	5.58±4.14
Number of deliveries	3.50±1.99
Number of children	3.28±1.95
Variables	n (%)
Education	
Primary school	53 (58.8)
Middle school	15 (16.7)
High school	19 (21.1)
Higher education	3 (3.3)
Occupation	
Homemaker	85 (94.4)
Employed	5 (5.6)
Income	
Less than adequate	39 (43.3)
Adequate	49 (54.4)
More than adequate	2 (2.2)
BMI	
18.5-24.9	8 (8.9)
25-59.9	20 (22.2)
≥39	14 (15.6)
Diabetes control based on HbA1C	
Yes	74 (82.2)
No	16 (17.8)

SD = Standard deviation, BMI = Body mass index

The results showed that subjects' mean score of sexual function was 21.72 ± 6.30 ranging between 31.40 and 2.80. With regard to the cut-off point of 26.55, reported in most of the studies, it is concluded that 74.4% of the subjects suffered from sexual dysfunction.^[33] In addition, subjects' mean scores in subscales of sexual desire and sexual arousal were lower than the obtained cut-off point, revealing their disorder in these two domains of sexual function [Table 2].

Subjects' mean score of QOL was 58.75 ± 16.24 , and their mean scores in domains of physical health, and mental health in QOL were 58.85 ± 17.69 and 58.65 ± 17.10 respectively. Among QOL subscales, the lowest score was for general health (46.77 ± 18.98) and the highest for physical functioning (69.39 ± 25.83) [Table 2]. Based on the findings of Kruskal-Wallis and Spearman correlation coefficient tests, there was a significant positive association between subjects' income (0.49), BMI (0.014), and length of disease (0.027), and sexual function. There was a positive and significant association between subjects' QOL and their income (0.003), BMI (0.003) and length of disease (0.001) while there was no significant association between subjects' age, education level, occupation, number of children, length of diabetes, and diabetes control, and variables of QOL and sexual function ($P > 0.05$).

Spearman correlation test showed a significant association between overall score of sexual function and its subscales, and QOL and its two dimensions ($P < 0.05$) [Table 3].

Discussion

Based on the findings, diabetic patients' QOL mean score was less than that of the subjects referring to diabetes clinic in Shahid Bahonar Hospital in Kerman, Iran and was more than that reported by Sadabadi and Babapour Kheirodin^[4,7] in Tabriz, Iran. The difference may be due to different lengths of disease in these two studies, compared to the present study. For instance, in the study of Saltan Ahmadi, subjects' length of diabetes was longer (8.20 ± 6.20 years) than the present study. In addition, the lowest score of QOL in the present study

was for subscale of general health and the highest for dimensions of social and physical functions. The results, reported by others studies on diabetic patients, are mostly in line with the present study. For instance, Thommasen *et al.* reported that the highest effect of diabetes was on reduction of physical functioning and general health role play and the lowest on subjects' social functional.^[34] In study of Sadabadi and Babapour Kheirodin, the highest effect of diabetes was reported on role limitation due to physical problems and role limitation due to emotional problem and the lowest (consistent with the present study) on patients' social functioning.^[4] In fact, diabetes can negatively affect physical function, development of the complications, mental and psychological conditions, and personal, familial and social communications leading to individuals' lowered QOL.^[35] Mayou *et al.* also showed that diabetic patients experience more reduction or absence of freshness and vitality, as well as fatigue, depression, irritability, tension, and stress that can lead to their lowered general health.^[36] Lindqvist and Sjöden, inconsistent with the present study, showed that the patients with peritoneal dialysis have lower scores in physical functioning domain and role limitation due to physical problems of QOL,^[37] possibly due to different natures of these two diseases.

Table 2: Mean score of sexual function, QOL and its subscales in studied women

Variable	Mean±SD	Maximum-minimum scores
Sexual function	21.7±6.30	2.80-30.40
Desire	2.98±0.91	1.20-5.40
Arousal	3.00±1.24	0-6
Lubrication	3.91±1.32	0-6
Orgasm	3.69±1.40	0-6
Pain	4.23±1.37	0-6
Sexual satisfaction	3.89±1.38	0.8-6
QOL	58.75±16.24	4.69-91.77
Physical health-overall	58.85±17.69	6.25-93.75
Physical functioning	69.39±25.83	0.00-100.00
Role limitation due to physical problems	59.10±28.27	0.00-100.00
Bodily pain	60.13±26.95	0.00-100.00
General health	46.77±18.98	5.00-85.00
Mental health-overall	58.65±17.10	3.12-96.35
Role limitation due to emotional problem	55.92±31.41	0.00-100.00
Vitality	53.88±18.82	0.00-93.75
Mental health	55.78±19.79	0.00-100.00
Social functioning	69.02±22.58	12.5-100.00

QOL = Quality of life, SD = Standard deviation

Table 3: Correlation of sexual function and its dimension with QOL and subscales of physical and mental health

Variables	QOL		Subscale of physical health of QOL		Subscale of mental health of QOL	
	r	P	r	P	r	P
Sexual function	0.481	0.001	0.409	0.001	0.478	0.001
Desire	0.340	0.001	0.289	0.006	0.359	0.001
Arousal	0.405	0.001	0.336	0.001	0.414	0.001
Lubrication	0.458	0.001	0.383	0.001	0.436	0.001
Orgasm	0.329	0.001	0.286	0.006	0.322	0.001
Pain	0.348	0.001	0.266	0.011	0.389	0.001
Sexual satisfaction	0.423	0.001	0.356	0.001	0.428	0.001

QOL = Quality of life

In addition, present study reported the prevalence of sexual function as 74.4% among the diabetic patients, which is less than that reported by Ziaei-Rad *et al.* among the diabetic women in Isfahan.^[38] The possible cause can be different sample sizes and the investigated type of diabetes (both types of diabetes were studied). According to several studies, prevalence of sexual dysfunction is higher in type one diabetic women, compared to type two, and 91% of the subjects in study of Ziaei-Rad *et al.* suffered from type one diabetes.^[39] Enzlin *et al.*, reported the prevalence of diabetic women's sexual dysfunction as 27%,^[40] possibly due to different sample sizes and a higher number of type one diabetes. In Enzlin study, the sample size was calculated with the goal of the investigation of diabetic patients' sexual dysfunction prevalence. Based on our obtained results, the highest sexual dysfunction was observed in dimensions of sexual desire and sexual arousal respectively. In another literature review study, it was reported that the most frequent sexual dysfunction in diabetic patients was for sexual desire and lubrication, but its effect on orgasm has been less showed.^[18,41]

In addition, statistical tests showed a positive significant association between sexual function and its all subscales, and QOL. In other words, an increase in sexual function score leads to the improvement of QOL. Sexual relationship often acts as a catalyzer between the couple to cause and preserve a friendly relationship and its dysfunction may affect individuals'

lifestyle leading to a marital relationship disorder, lower patients' self-confidence, and generally, influences individuals' QOL;^[23] therefore, paying close attention to diabetic women's sexual function can play a pivotal role in diabetic patients' QOL. Inconsistent with these results, Soltan Ahmadi *et al.* reported no significant association between diabetic women's sexual function and their QOL in Kerman.^[7] Moore *et al.* also reported no significant association between obese patients' overall score of sexual function and their QOL.^[42] On the contrary, Noosh-Abadi *et al.* (2014) reported a significant association between the sexual function of women with irritable bowel syndrome and their QOL in Tehran.^[23] Research on women with multiple sclerosis also shows an association between a reduction of sexual function and their all dimensions of QOL.^[43,44] These studies prove the effect of sexual function on QOL of the patients with chronic and specific diseases. Based on our findings, among the baseline variables, the level of income, BMI, and length of disease are the only variables associated with a sexual function and QOL. Some other studies showed a defect in QOL, resulted from a higher BMI. For instance, Monjamed *et al.* showed a significant association between diabetic patients' BMI and QOL, but inconsistent with the present study, they reported a significant association between subjects' age and education, and QOL.^[45] Ahmadi *et al.*, in a study in Charmahal and Bakhtiari province in Iran, reported no significant association between diabetic women's age and BMI, and their QOL.^[5] Abu Ali *et al.* showed a negative effect of subjects' age, BMI, and length of diabetes on women's sexual function in Jordan.^[46] Inconsistent with the present study, Ziaei-Rad *et al.* reported no significant association between length of disease and sexual function.^[38] In line with the present study, Fatemi and Taghavi reported a significant association between length of diabetes and severity of sexual dysfunction in 50 type two diabetic women in Mashhad^[47] (in a similar study population). There was no significant association observed between education, and QOL and sexual function in the present study. Fatemi and Taghavi also reported no significant association,^[47] but Saadatjoo *et al.* reported that diabetic individuals with education level of high school diploma and associate degree significantly had a better QOL, compared to other education levels.^[48] On the contrary, Darvishpoor *et al.* reported lowered QOL among the subjects with a bachelor's degree and over, compared with high school diploma and an associate degree.^[2] In addition, contrary to our obtained results, Ghasemi-Pour *et al.* reported a significant difference in QOL scores between type one and type two diabetic subjects with different occupational status.^[49] The association between occupational status and sexual function was not significant in the present study,

which is consistent with Fatemi and Taghavi.^[47] The association between disease condition and variables of sexual function and QOL was not significant in the present study, which is in line with Fatemi's study, conducted in a similar study population.^[47] Maiorino *et al.*, in a literature review, reported no clear role of hyperglycemia as the main determinant for diabetes vascular complications in the pathophysiology of the cardiovascular disorder.^[9] Despite the observed association between sexual function and QOL in diabetic women in the present study, this study had its own limitations including women's reluctance to complete sexual function questionnaire, and consequently, their probable distrustful responses to the questions. Meanwhile, the researchers tried to do her best to diminish their distrust through assuring them about anonymity and confidentiality of their data and overall analysis of the questionnaires. In addition, the questionnaires were completed in a private room by the subjects with no direct observation of the researcher.

Conclusion

Generally, based on obtained results, sexual function is among the important and relevant aspects of QOL in diabetic patients.

Detection and evaluation of sexual function can be effective on helping diabetic patients. In fact, this finding can be an efficient step toward management and designing of effective interventions to improve diabetic patients' QOL. Efficient psychotherapy to modify their sexual problems may also promote their QOL. Despite our obtained results, with regard to existing controversy in various studies, furthers studies to precisely investigate such associations and to conduct relevant interventions to detect other factors effective on diabetic patients' QOL are suggested.

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Conflicts of interest

There are no conflicts of interest.

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