



Sexual Quality of Life and Its Contributory Factors in Iranian Couples with Benign Prostatic Hyperplasia-Afflicted Spouses: A Cross-sectional Study

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Abstract

Objectives: The sexual quality of life (SQoL) of the couples can be significantly affected by benign prostatic hyperplasia (BPH). This study aims to investigate the status of SQoL and its contributory factors in 105 Iranian couples with BPH-afflicted spouses, who visited Urology clinics of hospitals affiliated to Shahid Beheshti University of Medical Sciences in Tehran-Iran.

Materials and Methods: In this descriptive cross-sectional study, the data were collected using questionnaires of Sexual Quality of Life-Male (SQoL-M), Sexual Quality of Life-Female (SQoL-F), International Prostate Symptoms Score (IPSS), International Index of Erectile Function (IIEF), and Female Sexual Functional Index (FSFI). Multiple regression was performed using SPSS 20 software.

Results: The variables of IIEF Overall Satisfaction sub-score (IIEF-OS) ($B=2.895$, $P<0.001$), IIEF Erectile Function sub-score (IIEF-EF) ($B=0.481$, $P<0.001$), FSFI Pain sub-score (FSFI-P) ($B=-2.348$, $P=0.001$), male's Financial situation ($B=4.417$, $P=0.034$), and disorder in male's social life ($B=5.553$, $P=0.013$) were the final predictors of Men's SQoL ($R^2=0.677$, $ADJ.R^2=0.660$, $R=0.823$). The variables of FSFI Satisfaction sub-score (FSFI-S) ($B=9.223$, $P<0.001$), FSFI-P ($B=-1.696$, $P=0.028$), and IIEF-OS ($B=2.918$, $P=0.002$) were the final predictors of their women's SQoL ($R^2=0.724$, $ADJ.R^2=0.716$, $R=0.851$).

Conclusions: In sum, the negative effect of BPH on the SQoL of the couples was confirmed and variables such as the male's financial situation from the socio-demographic factors, disorder in the male's social life from the factors related to BPH and FSFI-P, IIEF-OS Along with IIEF-EF from the factors of related to the couple's sexual function (FSFI and IIEF) were identified as the final predictors of Men's SQoL. Also, the variables of FSFI-S, FSFI-P, and IIEF-OS from the factors of related to the couple's sexual function (FSFI and IIEF) emerged as the final predictors of Women's SQoL. Accordingly, the sexual function of the couples with BPH was identified as one of the final predictors of their SQoL. Therefore, proper counselling and increased sexual awareness among couples may have played an important role in improving the quality of their sexual lives. It was recommended that health policy makers should prioritize the significance of SQoL and its association with the overall health of the couples with BPH in educational programs.

Keywords: Erectile dysfunction, Lower urinary tract symptoms, Prostatic hyperplasia, Quality of life, Spouses

Introduction

Benign prostatic hyperplasia (BPH) is the most common benign tumor in elderly men (1). The prevalence of BPH increases with age (2). While the overall prevalence of BPH is 26.2% (3), its prevalence is 23.8% in Iran (4). BPH is also the leading cause of lower urinary tract symptoms (LUTS) in elderly men (1). BPH can contribute to micturition dysfunctions, Nocturia and sexual dysfunction, impacting the quality of sleep and overall quality of life (QoL) of the patients (5). In other words, the QoL of the men with BPH and their spouses is greatly affected by more severe LUTS symptoms and worsens over time (6). Sexual dysfunction as well as LUTS associated with BPH can significantly influence the perceived quality of sexual life (7). Whereas a lower sexual quality of life (SQoL) is associated with difficulties in maintaining the relationships, both higher

intimate and social SQoL are linked to the increased satisfaction and stability in the relationships (8), as well as to the improved physical health and overall life satisfaction (9). Furthermore, a study has demonstrated that a poor sexual function has significant negative effect on SQoL (10). BPH, in effect, negatively influences the couples' sexual health due to its association with sexual dysfunction (11). Sells et al argue that 66% of the wives of the men with BPH experience a worsening of their sexual life (12). That is why QoL, particularly sexual desire, has been recently given a considerable attention when making decisions about the treatment of the men with BPH-related LUTS. Patients often make treatment choices based on the anticipated relief of LUTS and improvement in QoL, which includes sexual function but undervalues the improvements in physical measures (13). Indeed, sexual

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Key Messages

- ▶ The results of the present study confirmed the negative effect of BPH on the SQoL of the couples.
- ▶ Sexual function of the couples with BPH was identified as one of the final predictors of their SQoL.
- ▶ Since couples with BPH-sexual problems usually avoid discussing such issues with specialists due to the existing negative attitudes, it was recommended that SQoL programs as one of the key issues in the field of sexual and reproductive health should be introduced into the educational curriculum of the comprehensive health centers.
- ▶ Since healthcare providers may have limited knowledge about the effect of BPH on the couples' SQoL, it was suggested that these concepts (i.e., sexual health and sexual dysfunction related to couple's diseases) should be incorporated into their retraining programs.
- ▶ Since proper counseling and increased sexual awareness among couples significantly contribute to improving their SQoL, it was recommended that the sex counseling should be incorporated into pre- and post-treatment programs.

problems are undeniably a couple's issue, and dyadic processes and well-being that it not only negative affects both individuals, but also be exacerbated by both of them (14). The successful treatment of erectile dysfunction (ED) caused by BPH depends on the participation of both partners, evaluation of the changes in the SQoL, and their satisfaction (15). On the other hand, one of the main motivations for men with ED to seek successful treatment is their concerns about their partners' sexual satisfaction (16). Moreover, men with BPH often feel embarrassed and hesitant to seek medical help due to the prevailing religious and cultural norms (17). Their wives, similarly, experience feeling of shame and difficulty expressing their sexual desires (18). On the other hand, according to the ongoing global aging process (19) and the high prevalence of BPH in Iran (20), sexual problems in men with BPH have a high prevalence, but it has been less investigated (21). Despite the important role played by SQoL in life satisfaction and good feeling of the elderly, there are only a few studies on sexual dysfunction and decreased libido in the elderly. One reason could be the perception that the elderly no longer have sexual value. Additionally, age-related physiological and cognitive changes can naturally lead to sexual difficulties (22). Considering the facts that there was limited evidence about the factors influencing SQoL of the couples with BPH in Iran and that BPH-related healthcare costs increased annually (23) placing a significant financial burden on the patients with BPH (24), the present study aimed to assess SQoL and explore its contributory factors among Iranian the couples with BPH.

Patients and Methods

Study Design and Participants

In this descriptive cross-sectional study, STROBE checklist (25) (i.e., a tool for evaluating the quality of observational studies) was applied to examine 105 couples with BPH

who visited Urology clinics of hospitals affiliated to Shahid Beheshti University of Medical Sciences in Tehran from September 7, 2022 to March 19, 2023. A diagnosis of BPH was reached for them based on their medical history, clinical examinations, and paraclinical findings.

Inclusion and Exclusion Criteria

Inclusion criteria: couples aged 40 years or older and afflicted with BPH, participants completing an informed consent form and possessing literacy skills in reading and writing, participants having Iranian nationality, men with undergoing watchful waiting or drug therapy, men who were not candidates for surgery or were not in post-surgery period, no history of acute or chronic physical diseases such as diabetes, heart disease, kidney disease, addiction, connective tissue diseases and no use of drugs that affect sexual activity (such as antidepressants, neurological and antipsychotics) according to the couple's report, those diagnosed by a specialist doctor (BPH diagnosis included: (a) Digital rectal examination (DRE) for assessing prostate size and contour, evaluating the nodules, and detecting the areas suggestive of malignancy; (b) Laboratory studies included: 1) Urinalysis for evaluating the presence of blood, leukocytes, bacteria, protein, or glucose, 2) Urine culture was useful for excluding the infectious causes of irritative voiding and was usually performed if the initial urinalysis findings indicated an abnormality (26), 3) Prostate-specific antigen (PSA): Serum PSA levels may vary over time in the same man, but PSA levels of 4.0 ng/mL and lower are considered as normal (27). However, studies have shown that some men with PSA levels below 4.0 ng/mL may have prostate cancer (PCa) and that many men with higher levels did not have PCa (28). Initially, the total PSA values >4 ng/mL was considered pathologic, and when exceeding 10 ng/mL were strongly suggestive of malignancy (29). But today, a reduction for the upper limit is recommended to 2.5–3 ng/mL for patients between 60 and 65 years of age and younger (30). These results suggest, that PSA values are poorly affected by age itself and strongly correlated with increasing Prostate volume (PV) (29). But PV and its relationship to PSA are reported to be variable in different races (31). Therefore, the possibility to consider as indicative of benignity PSA values between 4 and 10 ng/ml, when these values are associated with relevant increase of PV and with PSA-free ratio greater than 10% (29). Upper limit of normal of age-adjusted median PSA values for various age groups have been determined as follows: 0.7 ng/mL (40–50 years), 0.8 mg/mL (50–60 years), 1.2 ng/mL (60–70 years), and 1.5 ng/mL (>70 years). These PSA levels have been indicated as significant determinative factors for PCa which are more valuable than family history, race, and DRE findings (32); (c) Ultrasonography (abdominal, renal, transrectal) facilitates determining the bladder and prostate size and the degree of hydronephrosis (if any) in patients with urinary retention or signs of kidney insufficiency. But it

is generally not recommended for the initial evaluation of uncomplicated LUTS) (26).

Exclusion criteria were unwillingness to participate in the study, willingness to withdraw from the study, and failure to complete the questionnaires.

Sampling

The sample size was calculated to be 96 couples taking into account the standard deviation of the sexual function score ($\sigma=5$) obtained by Yim et al (33), considering $\alpha=0.05$, $d=1$, $z=1.96$, and using the following formula:

$$n = \frac{z_{\alpha/2}^2 \sigma^2}{d^2}$$

After considering the anticipated 10% attrition rate, however, a total of 105 couples were included in the study. Multi-stage sampling method was used in this study. In order to select the sampling locations, first, the Urology clinics of Shahid Beheshti University of Medical Sciences of Tehran province were divided into four categories, and from each category, the clinics with the most clients were selected. Then, the sample size in each clinic was determined by quota method and considering the number of the clients (number of sample in Imam Hossein Hospital Clinic=10, Shohada-e-Tajrish Hospital Clinic = 55, Shahid Labbafi Nezhad Hospital Clinic= 22 and Shahid Modaress Hospital Clinic = 18) and, finally, sampling was performed in the clinics by using convenience sampling method. Then, in each clinic the samples were selected in such a way that they were the representatives of the community as much as possible and were appropriate to the research objectives. If one of the couples left the study or s/he failed to answer 10% of the questionnaire, the sample was removed and another couple was replaced.

Instrument and Measures

Socio-demographic Questionnaire

Socio-demographic characteristics of the couples were recorded using a validated researcher-made questionnaire. The questionnaire included 43 questions (16 questions about women and 27 questions about men) concerning personal and social information and BPH disease.

International Prostate Symptoms Score Questionnaire

An 8-item questionnaire was designed by Barry et al to evaluate the symptoms in patients with BPH. International Prostate Symptoms Score (IPSS) is divided into three domains: (a) IPSS-S: the storage (or irritative) symptom composite (i.e., voiding frequency, urgency, and nocturia), (b) IPSS-V: the voiding (or obstructive) symptom composite (i.e., incomplete emptying, intermittency, weak stream, and straining), and (c) IPSS-Q: The Quality of life composite. IPSS Total (IPSS-T) is concerned with the total of symptoms (IPSS-S) and IPSS-V. The score for each question is on a 6-point Likert scale ranging from 0 to 5. The IPSS score is categorized as follows: 0-7 (mild

symptoms), 8-19 (moderate symptoms), and 20-35 (severe symptoms). The score for the voiding subgroup ranges from 0 to 20, while the score for the storage symptom subgroup ranges from 0 to 15. Question 8, which is related to QoL, has a score range of 0 to 6, with 0 and 6 indicating the best and the worst quality of life situation, respectively (34). In Iran, the internal consistency was assessed (0.7) using Cronbach's alpha, and the test-retest reliability was confirmed with an ICC of 0.87 (35).

SQoL-M Questionnaire

An 11-item questionnaire was designed by Abraham *et al* to specifically measure the quality of men's sexual life, focusing on the dimensions of sexual self-confidence, emotional health, and interpersonal relationships during the last four weeks. This questionnaire is a useful tool for evaluating the SQoL of men with Premature Ejaculation (PE) and ED. The questionnaire's items are rated on a 6-point Likert scale ranging from 1 to 6, with a total score range of 11-66, where a higher score indicates a higher quality of life (36). The reliability of this questionnaire in Iran was assessed (0.94) performing a Cronbach's alpha. In terms of content validity, the mean scores of CVR (content validity ratio) and CVI (content validity index) were calculated as 0.91 and 0.87, respectively (37).

SQoL-F Questionnaire

An 18-question questionnaire with a 6-point Likert scale was designed by Symonds et al to assess the effect of sexual dysfunction on the overall SQoL experienced by women. Questions 1, 5, 9, 13, and 18 were scored in reverse. The range of the total score of the tool is between 18 and 108, with a higher total score indicating a higher level of SQoL (38). The reliability of this questionnaire in Iran was reported to be 0.73. As for the content validity, the mean scores for CVI and CVR were calculated as 0.91 and 0.84, respectively (39).

International Index of Erectile Function (IIEF) Questionnaire

Designed by Rosen et al, this questionnaire consists of 15 questions with a Likert scale ranging from 5 to 6, aiming to determine men's sexual dysfunction. The questionnaire comprises five domains, including erectile function, orgasmic function, sexual desire, intercourse satisfaction, and overall satisfaction. A higher score indicates better sexual performance, with a maximum acceptable score of 75 representing the best sexual status across different areas (40). In Iran, the test-retest reliability was found to be ($R=0.84-0.94$) and ($R=0.69-0.87$) for the healthy group and the patient group, respectively, and the construct validity was confirmed conducting confirmatory factor analysis (41).

Female Sexual Functional Index (FSFI) Questionnaire

This 19-item questionnaire was designed by Rosen et

al to measure women's sexual function in six domains, including sexual desire, sexual arousal, vaginal lubrication, orgasm, satisfaction, and pain during sexual activity. The domains are assessed using a response range from zero or one to five, where a score of five indicates greater sexual function. The total score for each individual is calculated by summing the scores from each domain, with a minimum score of 2 and a maximum score of 36. A score below 28 indicates unfavorable sexual function. A score of zero in each domain shows no sexual activity during the last month (i.e., last four weeks) (42). In Iran, the construct validity of the tool was confirmed performing exploratory factor analysis, and its reliability was assessed using the retest method, with an R value of 0.71 (43).

Statistical Analysis

The extracted data were statistically analyzed using SPSS version 20. Descriptive statistics were used to calculate the percentage, mean, and standard deviation, while inferential statistics were used to analyze and find the relationships. First, the distribution of quantitative variables was assessed using Kolmogorov-Smirnov test. In order to examine the multiple linear regression test, the presuppositions of the regression model were examined. To this end, first univariate regression was performed where the dependent variables were the score of the couple's SQoL and independent variables were the variables with a lower than 0.05 significance level ($P < 0.05$), which entered the initial model of multiple linear regression. Then given the facts that the variance inflation factor (VIF) values were lower than 10 and that the tolerance index (TI) was greater than 0.1, the problem of multicollinearity was not observed in the independent variables and, thus, all requirements of the regression model were met and Stepwise multiple linear regression test was used.

Results

According to the results from the analysis of 105 couples, the participation rate was 100%. The mean (SD) of men's age and that of their wives were 61.82 (12.22) and 55.41 (14.19) years, respectively. Socio-demographic characteristics and information of the subjects with BPH are presented in Table 1. The mean (SD) of the IPSS-T score was 16.53 (10.76). Greater details are shown in Table 2. The mean (SD) of total SQoL-F score in our studied population was higher than that of SQoL-M (48.82 (13.52) vs 77.48 (25.34)). Given the fact that a score up to 36 was considered poor, a score of 37-72 was classified as average, and a score of 73-108 was regarded as high, the SQoL for men and women in the present study were medium and high, respectively. Pearson's correlation test showed that there was a significant positive correlation between SQoL-F and SQoL-M ($R=0.792, P<0.001$), and that the intensity of the correlation was strong. The mean (SD) of total FSFI score in our studied population was 21.64

Table 1. Variables of the Socio-demographic Factors and Factors Related to BPH in Iranian Couples with BPH (N=105 couples)

Variables		Value
Variables of the Socio-demographic factors		
Male's age (y)		61.82 ± 12.22
Female's age (y)		55.41 ± 14.19
Age difference (y)		9.36 ± 9.62
Male's BMI (kg/m ²)		26.81 ± 3.13
Duration of marriage (y)		33 ± 17.56
Male' educational level	Non-academic	73 (69.52)
	Academic	32 (30.47)
Female's educational level	Non-academic	61 (58.09)
	Academic	44 (41.90)
Male's financial situation	Satisfied	47 (44.8)
	Intermediate	32 (30.5)
	Dissatisfied	26 (24.8)
Female's financial situation	Satisfied	49 (46.7)
	Intermediate	31 (29.5)
Male's employment situation	Employed	72 (68.57)
	Retired	33 (31.42)
Female's employment situation	Employed	49 (46.66)
	Housewife and retired	56 (53.33)
Living in a house	Yes	90 (85.7)
	No	15 (14.3)
Type of Marriage	Permanent	87 (82.9)
	Temporary	18(17.1)
Variables of the factors related to BPH		
Situation of medication use	Continuous	72 (68.57)
	Drug discontinuance	33 (31.43)
Type of medication treatment	Waiting	14 (13.3)
	Drug treatment	91 (86.7)
The reason for visiting the doctor	Sexual disorders	16 (15.2)
	Storage and voiding symptoms	89 (84.8)
Disorder in female's social life	Yes	58 (55.2)
	No	47 (44.8)
Duration of BPH (month)		69.51 ± 67.30
PSA level at the last test (ng/mL)		7.56 ± 5.69
Prostate volume at last test (mL)		85.17 ± 36.23
Age at the onset of the disease (y)		58.2 ± 9.12
Duration of medication use (month)		12.08 ± 13.48
Male's fear of prostate surgery	Yes	63 (60)
	No	42 (40)
Female's fear of prostate surgery	Yes	36 (43.3)
	No	69 (65.7)
Male's fear of prostate cancer	Yes	75 (71.4)
	No	30 (28.6)
Female's fear of prostate cancer	Yes	59 (56.2)
	No	46 (43.8)
Male's fear of sexual side effects medication use	Yes	76 (72.4)
	No	29 (27.6)
Male's concern about health status	Yes	89 (84.8)
	No	16 (15.2)
Female's concern about her husband of health status	Yes	47 (44.8)
	No	58 (55.2)
Male's action for treatment of sexual problems	Yes	44 (41.9)
	No	61 (58.1)
Female's action for treatment of sexual problems	Yes	41 (39)
	No	64 (61)

Table 1. Continued

Variables		Value
Male's depression disorder	Yes	65 (61.9)
	No	40 (38.1)
Female's feeling embarrassed and ashamed from afflicted-BPH husband	Yes	43 (41)
	No	62 (59)
Male's sleep disorder	Yes	60 (57.1)
	No	45 (42.9)
Female's sleep disorder	Yes	50 (47.6)
	No	55 (52.4)
Disorder in male's social life	Yes	74 (70.5)
	No	31 (29.5)

BMI, body mass index; PSA, prostate-specific antigen.

Data are expressed as mean \pm SD or No. (%)

(9.95). Orgasmic disorder had the highest prevalence among the dimensions of FSFI. Among the dimensions of the IIEF, moreover, the highest prevalence was observed in the dimension of intercourse dissatisfaction. More details are shown in Table 3. Table 4 summarizes the results of univariate linear regression, where the scores of SQoL of couples with BPH as the dependent variable and independent variable (i.e., socio-demographic factors and factors related to BPH and IPSS and its sub-scores as well as the sexual function of couples) were individually entered into the model. Then, multiple linear regression was used and the significant variables of linear regression were entered into the model. According to the results of multiple regression, 66% of the variance of the overall score of "Men's SQoL" was explicable by five predictable variables. Given the fact that ($R^2=0.68$), 32% of the changes

were affected by the factors and variables outside the study, and 68% of the remaining changes in "Men's SQoL" were caused by the variables considered as independent variables in this study. More details are shown in Table 5. According to the results of multiple regression, moreover, 72% of the variance of the total score of "women's SQoL" was explicable by three predictor variables. Given the value of ($R^2=0.72$), 28% of the remaining changes were affected by the factors and variables outside the study, and 72% of the changes in "women's SQoL" were caused by the variables considered as independent variables in this study. More details are shown in Table 6.

Discussion

This study aimed to investigate the status of SQoL and its contributory factors in Iranian couples with BPH. Several significant factors including age, physical/psychological health, increased level of education, positive attitude towards sexual issues, fulfilled social relationships, physical/mental health of the spouse, and sleep satisfaction contribute to a higher SQoL among the elderly (10). In the present study, the total mean score of the SQoL for women was higher than that for men, which was not consistent with the findings from some previous studies suggesting a higher SQoL among men compared to women. This inconsistency may have been attributed to several factors, such as difference in sample size, research environment, and the nature of the participants. It is noteworthy that the earlier studies might have focused on healthy individuals, whereas the present study examined the individuals with BPH (44). In our study, moreover, the lowest score among all dimensions assessed in the IIEF was recorded for the

Table 2. The Mean (SD) of IPSS with Its Sub-scales Score in Iranian Couples with BPH (N=105 Couples)

Variables	Subscales	Phrases	Mean \pm SD	Score out of 100	Range of scores	Scoring	No. (%)
IPSS-V		Incomplete bladder emptying	9.06 \pm 6.11	48	1-20		
		Straining					
		Intermittency					
		Weak stream					
IPSS-S		Frequency	6.92 \pm 4.75	46.13	0-15		
		Nocturia					
		Urgency					
IPSS	IPSS-T		16.53 \pm 10.76	47.22	1-35	Mildly symptomatic (0-7)	39 (37.1)
						Moderately symptomatic (8-19)	36 (34.3)
						Severely symptomatic (20-35)	30 (28.6)
						Delighted	3 (2.9)
						Pleased	7 (6.7)
						Mostly Satisfied	15 (14.3)
						Mixed (about equally satisfied and dissatisfied)	15 (14.3)
IPSS-Q	If you were to spend the rest of your life with your urinary condition the way it is now, how would you feel about that?		4.06 \pm 1.80	67.66	0 - 6	Mostly dissatisfied ^a	14 (13.3)
						Unhappy	17 (16.2)
						Terrible	34 (32.4)

IPSS, International Prostate Symptoms Score; IPSS-Q, The Quality of life composite; IPSS-S, The storage (or irritative) symptom composite; IPSS-T, The total of the (IPSS-S) and the (IPSS-V); IPSS-V, The voiding (or obstructive) symptom composite.

^a The mean quality of life score was 4.06, indicating that the majority of men were dissatisfied with their quality of life while dealing with their current urinary conditions.

Table 3. The Mean (SD) of FSFI and the IIEF with Their Sub-scales Scores in Iranian Couples with BPH (N=105 Couples)

Variables	Subscales	Mean (SD)	Score out of 100	Range of scores	Scoring	No. (%)
FSFI	D	3.84 ± 1.51	64	1.2-6		
	A	3.40 ± 1.88	56.66	0-6		
	L	3.92 ± 1.98	65.33	0-6		
	O	2.78 ± 1.80	46.33	0-6		
	S	4.02 ± 1.76	67	0.8-6		
	P	3.67 ± 2.14	61.16	0-6		
Sexual function	T	21.64 ± 9.95 ^a	60.11	2-36		
IIEF	EF ^b	16.53 ± 8.95	55.1	1-30	Under 14	47(44.8)
					14-25	34(32.4)
					26-30	24(22.9)
	OF	5.29 ± 3.17±	52.9	0-10		
	SD	6.07 ± 2.52±	60.7	2-10		
	IS	7.93 ± 4.40±	52.86	0-15		
	OS	6.88 ± 2.77±	68.8	2-10		
	T	42.72 ± 20.77	56.96	5-75		

FSFI, Female Sexual Function Index; FSFI-A, FSFI Arousal sub-score; FSFI-D, FSFI Desire sub-score; FSFI-L, FSFI Lubrication sub-score; FSFI-O, FSFI Orgasm sub-score; FSFI-P, FSFI Pain sub-score (Female's Pain during and following the vaginal penetration); FSFI-S, FSFI Satisfaction sub-score (Female's satisfaction with degree of closeness to her partner and sexual relationship and overall sex life); IIEF, International Index of Erectile Function; IIEF-EF, IIEF Erectile Function sub-score; IIEF-IS, IIEF Intercourse Satisfaction sub-score; IIEF-OF, IIEF Orgasmic Function sub-score; IIEF-OS, IIEF Overall Satisfaction sub-score (Male's overall satisfaction with their sex life and sexual relationship with his spouse); IIEF-SD, IIEF Sexual Desire sub-score.

^a According to the cutoff point of 28 for the entire scale, the sexual function of the women in the study was deemed unfavorable.

^b As for the erectile function subscale, 44.8% of men had a score of <14 and low erectile function; 32.4% had a score between 14-25 and an average erectile function; and 22.9% had a score between 26-30 and high erectile function.

IIEF-IS dimension, which was consistent with the finding from the study by Rosen et al reporting that an intercourse satisfaction decreased as the age and severity of LUTS increased (45). In the current study, the lowest score in the FSFI dimensions was recorded for the FSFI-O dimension, which was in line with the result from the study by Öberg et al reporting that women experiencing distress due to low sexual desire or orgasmic dysfunction were more likely to have partners with ED (46).

Our study results indicated that variables such as the male's financial situation from the socio-demographic factors, disorder in the male's social life from the factors related to BPH and FSFI-P, IIEF-OS Along with IIEF-EF from the factors of related to the couple's sexual function (FSFI and IIEF) were identified as the final predictors of Men's SQoL.

According to our study findings, moreover, there was an average increase of 0.481 points in the men's SQoL score for every increase in IIEF-EF score when all other variables were kept constant.

Nearly 45% of the men in our study were found to have a lower erectile function score, which was in line with the findings from a study by Yafi et al arguing that ED had a negative impact on the patient's SQoL (47). In our study, moreover, men were detected to experience mild, moderate, and severe LUTS at rates of 37%, 34%, and 28%, respectively, which was in line with the finding from a study by Ishizuka et al reporting a significant relationship between the severity of LUTS and the severity of ED (48).

Both ED and LUTS have been also determined to have a negative impact on the QoL and sexual health (49). Therefore, sexual dysfunction can significantly affect on the perceived quality of sexual life (7). In the present study, an average score for the SQoL was obtained by men.

In this study, it was observed that the Men's SQoL score increased by an average of 2.895 points for every increase in the IIEF-OS score when all other variables were kept constant.

Although the highest score of IIEF dimensions in the present study was related to IIEF-OS, some men were not satisfied with their sexual life and sexual relationship with their wives. Cameron et al demonstrated that ED had a negative effect on sexual satisfaction and relationship satisfaction (50). In our study, given the low erectile function score of the men as well as the fact that individual SQoL affects on relationship satisfaction and it is influenced by it (45), Men's SQoL score of this study was affected. Furthermore, an increase in the severity and number of individual LUTS is negatively associated with the sexual desire, intercourse satisfaction, and overall satisfaction (51), and the patients with severe urinary symptoms (IPSS>12) have lower sexual desire and overall satisfaction than the patients with mild urinary symptoms (IPSS<12) (52). Considering the IPSS-T score of 16.6 for men in this study and given the facts that the QoL score decreases with an increase in the IPSS score (53) and that an essential part of the QoL is the quality of sexual life (54), it was argued that the men's SQoL score was affected

Table 4. Univariate Linear Regression between the Variables of the SQoL (SQoL-M and SQoL-F) and the Socio-demographic Factors, Factors Related to BPH, IPSS as well as the Sexual Function of Couples (FSFI and IIEF) in Iranian Couples with BPH (N=105 Couples)

Variables	SQoL-F				SQoL-M			
	B	P-value	95% CI		B	P-value	95% CI	
			Lower	Upper			Upper	Lower
Male's age (y)	-0.146	0.475	-0.550	0.258	-0.184	0.090	0.029	-0.397
Female's age (y)	-0.124	0.481	-0.472	0.224	-0.193	0.038^b	-0.011	-0.376
Age difference (y)	3.638	0.370	-4.376	11.651	0.435	0.841	4.727	-3.857
Male's BMI (kg/m ²)	-1.301	0.101	-2.860	0.258	-0.634	0.135	0.200	-1.468
Duration of marriage (y)	-0.096	0.499	-0.378	0.185	-0.136	0.071	0.012	-0.284
Male' educational level (Non-academic ^a)	16.183	0.001^b	6.806	25.560	7.109	0.007^b	12.203	2.014
Female's educational level (Non-academic ^a)	9.992	0.043^b	0.327	19.657	5.185	0.049^b	10.348	0.021
Male's financial situation	27.177	<0.001^b	17.065	37.288	13.881	<0.001^b	19.339	8.423
Female's financial situation	27.833	0.001^b	17.615	38.050	14.055	<0.001^b	19.587	8.523
Male's employment situation (Retired ^a)	11.864	0.017^b	2.202	21.526	5.876	0.026^b	11.053	0.700
Female's employment situation (Housewife and Retired ^a)	-9.712	0.054	-19.409	-0.014	0.092	0.973	5.365	-5.181
Living in a house (Yes ^a)	5.033	0.479	-9.021	19.087	2.456	0.518	9.958	-5.047
Type of marriage (permanent ^a)	4.241	0.521	8.813-	17.296	2.017	0.567	8.986	-4.952
Duration of BPH (Month)	-0.055	0.136	-0.128	0.018	-0.039	0.047^b	-0.001	-0.078
PSA level (ng/mL)	-0.219	0.619	-1.087	0.650	-0.139	0.554	0.325	-0.602
Prostate volume (mL)	-0.285	0.001^b	-0.410	-0.161	-0.206	<0.001^b	-0.145	-0.267
Age at the onset of the disease(years)	-0.093	0.735	-0.636	0.450	-0.204	0.162	0.083	-0.491
Duration of medication use (Month)	-0.311	0.091	-0.674	0.051	-0.256	0.009^b	-0.067	-0.446
Male's fear of prostate surgery (Yes ^a)	15.183	0.002^b	5.567	24.798	8.024	0.003^b	13.160	2.888
Female's fear of prostate surgery (Yes ^a)	-11.731	0.024^b	-21.861	-1.601	-1.444	0.606	4.091	-6.980
Male's fear of prostate cancer (Yes ^a)	4.267	0.439	-6.614	15.147	6.260	0.031^b	11.953	0.567
Female's fear of prostate cancer (Yes ^a)	-0.826	0.869	-10.761	9.109	3.555	0.183	8.811	-1.702
Male's fear of sexual side effects medication use (Yes ^a)	-5.912	0.287	-16.877	5.054	-2.336	0.432	3.530	-8.202
Male's concern about health status (Yes ^a)	-3.744	0.589	-17.441	9.954	1.013	0.784	8.331	6.304-
Female's concern about her husband of health status (Yes ^a)	-10.753	0.030^b	-20.442	-1.064	-1.389	0.603	3.895	-6.672
Male's action for treatment of sexual problems (Yes ^a)	15.585	0.002^b	6.068	25.101	11.676	<0.001^b	16.495	6.857
Female's action for treatment of sexual problems (Yes ^a)	16.163	0.001^b	6.564	25.762	11.283	<0.001^b	16.204	6.362
Male's depression disorder (Yes ^a)	22.558	0.001^b	13.413	31.702	15.340	<0.001^b	19.853	10.828
Female's feeling embarrassed from husband disease (Yes ^a)	10.117	0.044^b	0.289	19.946	8.926	0.001^b	13.983	3.868
Male's sleep disorder (Yes ^a)	15.911	0.001^b	6.447	25.375	13.522	<0.001^b	18.135	8.910
Female's sleep disorder (Yes ^a)	14.902	0.002^b	5.470	24.333	11.433	<0.001^b	16.203	6.663
Disorder in male's social life (Yes ^a)	20.595	<0.001^b	10.564	30.625	16.675	<0.001^b	21.434	11.917
Disorder in female's social life (Yes ^a)	14.720	0.003^b	5.233	24.208	11.904	<0.001^b	16.656	7.153
The reason for visiting the doctor (Storage & Voiding ^a)	-8.463	0.221	-22.080	5.154	-10.268	0.005	-3.229	-17.308
Type of medication treatment (waiting ^a)	-18.231	0.012^b	-32.289	-4.173	-16.516	<0.001^b	-9.483	-23.550
Situation of medication use (Continuous ^a)	13.269	0.009^b	3.454	23.084	9.242	<0.001^b	14.350	4.135
(IPSS-V)	-1.756	<0.001^b	-2.490	-1.023	-1.171	<0.001^b	-0.804	-1.538
(IPSS-S)	-2.343	<0.001^b	-3.280	-1.406	-1.531	<0.001^b	-1.062	-2.000
(IPSS-T)	-1.023	<0.001^b	-1.437	-0.608	-0.676	<0.001^b	-0.469	-0.883
(IPSS-Q)	-6.305	<0.001^b	-8.758	-3.851	-4.386	<0.001^b	-3.198	-5.574
(FSFI-D)	8.518	<0.001^b	5.710	11.326	4.019	<0.001^b	5.574	2.464
(FSFI-A)	7.489	<0.001^b	5.305	9.672	3.546	<0.001^b	4.765	2.326
(FSFI-L)	5.020	0.001^b	2.727	7.314	2.693	<0.001^b	3.916	1.470
(FSFI-O)	8.699	<0.001^b	6.552	10.846	4.257	<0.001^b	5.458	3.055
(FSFI-S)	11.972	<0.001^b	10.409	13.536	4.911	<0.001^b	6.066	3.756
(FSFI-P)	4.563	<0.001^b	2.430	6.695	2.378	<0.001^b	3.521	1.236
(FSFI-T)	1.540	<0.001^b	1.143	1.936	0.732	<0.001^b	0.956	0.508
(IIEF-EF)	1.519	<0.001^b	1.053	1.985	0.915	<0.001^b	1.150	0.681
(IIEF-IS)	2.750	<0.001^b	1.764	3.737	1.733	<0.001^b	2.228	1.238
(IIEF-OF)	4.104	<0.001^b	2.765	5.442	2.684	<0.001^b	3.331	2.037
IIEF-SD)	4.961	<0.001^b	3.253	6.669	3.111	<0.001^b	3.965	2.257
(IIEF-OS)	7.082	<0.001^b	5.951	8.213	3.741	<0.001^b	4.359	3.129
(IIEF-T)	0.701	<0.001^b	0.506	0.897	0.423	<0.001^b	0.520	0.327

^a Reference group.

^b Estimated, unstandardized regression coefficients with 95% CI; P<0.05 is significant.

Table 5. Multivariable Linear Regression between the Variables of SQoL-M and the Socio-demographic Factors, Factors Related to BPH, IPSS as well as the Sexual Function (FSFI and IIEF) in Iranian Couples with BPH (N = 105 couples)

Model ^a		B	SE	Beta	P Value	95% CI	
						Lower	Upper
(Constant)		17.053	2.689		<0.001	11.719	22.388
The variable of the total score of the sexual function (FSFI and IIEF)	IIEF.OS	2.895	0.418	0.593	<0.001	2.064	3.725
	IIEF.EF	0.481	0.209	0.318	0.024	0.065	0.896
	FSFI.P	-2.348	0.698	-0.372	0.001	-3.733	-0.962
The variable of the socio-demographic factors	Male's financial situation	4.417	2.049	0.142	0.034	0.351	8.482
The variable of the factors related to BPH	Disorder in male's social life	5.553	2.190	0.188	0.013	1.208	9.899

FSFI, Female Sexual Function Index; FSFI-P, FSFI Pain sub-score (Female's Pain during and following vaginal penetration); IIEF, International Index of Erectile Function; IIEF-EF, IIEF Erectile Function sub-score; IIEF-OS, IIEF Overall Satisfaction sub-score (Male's overall satisfaction with their sex life and sexual relationship with his spouse); IPSS, International Prostate Symptom Score; SQoL-M, Sexual Quality of life –Male.

^a The presented regression model was significant ($P < 0.001$).

(Durbin-Watson=1.929, $R^2=0.677$, ADJ. $R^2=0.660$, $R=0.823$).

Table 6. Multivariable Linear Regression between the Variables of SQoL-F and the Socio-demographic Factors, Factors Related to BPH, IPSS as well as the Sexual Function (FSFI and IIEF) in Iranian Couples with BPH (N=105 Couples)

Model ^a		B	SE	Beta	P Value	95% CI	
						Lower	Upper
(Constant)		26.483	3600		<0.001	19.342	33.624
The variable of the total score of the sexual function (FSFI and IIEF)	FSFI.S	9.223	1.397	0.641	<0.001	6.452	11.995
	FSFI.P	-1.696	0.763	-0.143	0.028	- 3.210	- 0.182
	IIEF.OS	2.918	0.918	0.319	0.002	1.097	4.739

FSFI, Female Sexual Function Index; FSFI-P, FSFI Pain sub-score (Female's Pain during and following vaginal penetration); FSFI-S, FSFI Satisfaction sub-score (Female's satisfaction with amount of closeness with partner and sexual relationship and overall sex life); IIEF, International Index of Erectile Function; IPSS, International Prostate Symptom Score; IIEF-OS, IIEF Overall Satisfaction sub-score (Male's overall satisfaction with their sex life and sexual relationship with his spouse); SQoL-F, Sexual Quality of life –Female.

^a The presented regression model was significant ($P < 0.001$).

(Durbin-Watson=1.731, $R^2=0.724$, ADJ. $R^2=0.7160$, $R=0.851$).

in the study. In the present study, moreover, the Voiding Subscore was more annoying for the patients than the Storage Subscore (48% to 46%). There is also evidence that sexual dysfunction is more prevalent in men with voiding symptom composite (55). Given the relationship between the mean score of sexual function and the score of SQoL and since poor sexual function significantly affects the SQoL (10), Men's SQoL score was overshadowed in the present study.

In this study, it was observed that the Men's SQoL score decreased by an average of 2.348 points for every increase in the FSFI-P score when all other variables were kept constant.

In our study, Men's sexual dysfunction had a significant negative impact on their wives' sexual function. Similarly, Çayan et al found that women whose husbands were afflicted with ED had significantly lower scores in FSFI domains such as arousal, lubrication, and pain (56). Heidary et al also discovered that BPH-caused ED and PE led to a situation where women were not desirably aroused, causing them pain during the intercourse (57). Furthermore, ED treatment has been shown to improve the SQoL for both the patients and their partners (58). Given the fact that the SQoL is influenced by the diseases and sexual satisfaction (59), therefore, the BPH

condition certainly overshadowed the SQoL in our study participants.

Accordingly, the Men's SQoL score increased by an average of 4.417 points for every increase in the men's financial situation score when all other variables were kept constant.

In the present study, 24.8% of the men suffered an unfavorable financial situation. Given the fact that socio-economic situation, sexual function, and sexual satisfaction affect the SQoL (59,60), therefore, it was predictable that %25 of the men in our study had low SQoL. Moreover, 31.42% of the men in our study were retired and as Najimi et al argued, the employment status (employed to retired) improved men's quality of sexual life (61). In fact, higher income for men with BPH means higher income for the family, which, in turn, stabilizes the economic situation of the family and reduces its financial stress, thereby improving Men's SQoL. Therefore, it was predictable that one third of the men in our study had low SQoL.

Finally, the Men's SQoL score increased by an average of 5.553 points in the men whose social life was not affected by BPH when all other variables were kept constant.

In the present study, it was found that 70.5% of men experienced disturbances in their social life. The sleep

disturbances due to nocturia associated with BPH result in men's daytime sleepiness, poor concentration, anxiety, and impaired job performance, thereby impacting their overall QoL. It has a negative effect on men's social relationships, social activities, and sexual intercourse (62). In addition, it contributes to a decline in men's five-dimensional sexual function (63) and decrease their SQoL (61). Since sexual life is an integral part of overall quality of life, the SQoL score of men with BPH can be significantly affected by a disturbance in their social life. Furthermore, the findings of the present study revealed that the variables of FSFI-S, FSFI-P, and IIEF-OS from the factors of related to the couple's sexual function (FSFI and IIEF) emerged as the final predictors of Women's SQoL.

In the present study, it was observed that the Women's SQoL score increased by an average of 9.223 for every increase in the FSFI-S score when all other variables were kept constant.

In our study, the FSFI-S score was found to be the highest score among the FSFI dimensions. However, it should be noted that some women in the study did not experience sexual satisfaction. It is evident that ED caused by BPH in men has a negative impact on all areas of FSFI. Our study result in this regard was in agreement with the finding by Meston et al arguing that any cause of ED led to a significant decrease in sexual desire, arousal, orgasm, sexual satisfaction, and frequency of sexual activity for both partners (64). Given that ED has a negative effect on SQoL of the patients and their partners as well as on their satisfaction with the relationship (47), a healthy partner seems to be a crucial factor contributing to a higher SQoL, particularly among the elderly (65). According to our study findings, therefore, it was implied that the presence of BPH and the associated sexual dysfunction significantly influenced the Spouse's SQoL, which was consistent with the results from previous studies.

It was observed that the Women's SQoL score decreased by an average of 1.696 points for each increase in the FSFI-P score when all other variables were kept constant.

Evidence has indicated that the wives of the men with ED have a significantly lower vaginal lubrication and Sexual Arousal (66). Furthermore, women's concerns about their husbands' cancer and surgery serve as inhibiting factors for vaginal lubrication and can lead to pain during sexual intercourse (67). It is likely that some of the women in the present study also experienced disorders in this dimension. It is widely recognized that arousal plays a vital role in determining the quality of women's sexual life (68). And given that a woman's sexual response is influenced by her sexual partner (69), it is likely that some of the men in this study did not possess the necessary attractiveness for their sexual partner, leading to a decrease in their self-confidence during sexual encounters. Consequently, the Women's SQoL score in the study was affected by the presence of BPH in their husbands.

Eventually, it was found that the Women's SQoL score

increased by an average of 2.918 points for each increase in the IIEF-OS score when all other variables were kept constant.

The level of satisfaction with the sexual life of middle-aged couples is significantly influenced by sexual dysfunctions (70). BPH can exacerbate this dysfunction because the burden of LUTS extends beyond the affected individuals, influencing their wives as well (71). Severe urinary symptoms resulting from BPH, combined with sleep disorders and anxiety, often contribute to a poor sexual function, including ED and ejaculatory dysfunction (EjD). Men with BPH may experience dissatisfaction with the frequency of sexual intercourse and ability to engage with it (72) as well as a decreased sexual desire and satisfaction (73). Conversely, an increase in sexual satisfaction has been associated with reduced intensity and shorter duration of ED (49). In the current study, it was also determined that the men with BPH experienced considerable pressure placed on them by their dissatisfied spouses or partners due to a poor sexual function. This pressure ultimately affected their ability to satisfy their partners and, consequently, impacted their own SQoL. As a result, this situation put their relationship with their spouses at risk.

Strengths and Limitations

The greatest strength of our study was the application of FSFI standard questionnaire (42) and, particularly, the IIEF questionnaire (40) which offers the advantages of relative brevity and ease of use, inclusion of multiple areas of sexual function, and strong psychometric characteristics. Our study also faced some limitations. First, it was a descriptive study examining the QoL of the couples at a specific point in time. Second, it relied on self-reported data, which may have introduced recall bias or social desirability bias in it. Third, IPSS questionnaire also imposed some limitations on our study (34). Among other things, it is not a diagnostic method for BPH, and other conditions may also cause these symptoms or cultural/linguistic problems may affect the audience's understanding of its questions (34,74). Furthermore, the IIEF has potential disadvantages, including limited assessment of specific domains (e.g., libido and orgasmic function), limited time frame (four weeks), and uncertain validity in selected populations (e.g., psychiatric patients) (40). Fourth, performing specialized examinations to show the presence of mental illnesses and relying on the participants' self-reports were not possible. Finally, this study is conducted in an Iranian population, and cultural factors may influence SQoL and its predictors which may have limited the generalizability of our findings to other populations or settings.

Conclusions

It was concluded that the male's overall satisfaction from sex life, IIEF erectile function subscore, female's pain

following vaginal penetration, male's financial situation, and disorder in male's social life were identified as the final predictors of Men's SQoL. It was also revealed that the variables of female's satisfaction from overall sex life, female's pain following vaginal penetration, and male's overall satisfaction from sex life were the final predictors of Women's SQoL. Since Iranian couples with sexual problems usually avoid discussing such issues with specialists and counselors due to the existing negative attitudes, it was recommended that SQoL programs as one of the key issues in the field of sexual and reproductive health should be introduced into the educational curriculum of the comprehensive health centers. Since the healthcare providers in Iran may have limited knowledge about the sexual health and its significance, it was suggested that these concepts (ie, sexual health and SD related to couple's diseases) should be incorporated into the retraining programs in order to help them provide the patients and their partners with greater support. It was also recommended that specific topics such as the patients and their partners' awareness of the benign nature of disease, its impact on sexual function, and awareness of the outcomes of various treatment approaches should be addressed. This approach may have significantly contributed to improving their SQoL and overall well-being. Therefore, given the high costs of BPH in the future due to the aging population, it was suggested that a systematic management and strategic approach should be developed to deal with BPH.

Directions for Future Research

The authors suggested conducting longitudinal studies since they provide more comprehensive insights into the factors influencing the SQoL of the couples with BPH. Also, Further studies are needed in the future to validate the impact of various factors on the SQoL among Iranian couples with BPH, as well as to explore additional potential factors that may influence it.

Authors' Contribution

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Conflict of Interests

The authors declare that they have no conflict of interests.

Ethical Issues

Ethical protocols of the current study were reviewed and approved by Ethics Committee of Shahid Beheshti University of Medical Sciences in Iran (Reference no: IR.SBMU.PHARMACY.REC.1399.122). All participants were informed of the study purpose and the information collection methods. Written consent was obtained from all participants before inclusion in the study, and the participants were informed of their rights to withdraw from the study at any stage of it. Furthermore, several measures were employed by the researcher to adhere to the ethical principles and protect the confidentiality of the participants' responses. First, participants were assured that their responses would be handled confidentially. Second, the collected data would be only used for research purposes. Finally, the identities of the participants would be kept confidential and would not be disclosed at any stage of the research implementation or publication of findings.

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