



Exploring Sexual Function and its Affecting Factors in Iranian Women with Benign Prostatic Hyperplasia-Afflicted Spouses Referring to Urology Clinics of Shahid Beheshti University of Medical Sciences in Tehran: A Cross-sectional Study

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Abstract

Objectives: Women's sexual function can be significantly affected by the benign prostatic hyperplasia (BPH) of their spouses. Therefore, this study aimed to investigate sexual function and its affecting factors in Iranian women with BPH-afflicted spouses.

Materials and Methods: The present cross-sectional study included 105 Iranian women with BPH-afflicted spouses. Data were collected using the Female Sexual Functional Index (FSFI), International Prostate Symptoms Score (IPSS), and International Index of Erectile Function (IIEF). Multiple regression was analyzed using SPSS 20 software.

Results: The mean age of women and their husbands was 55.41 ± 14.19 and 61.82 ± 12.22 , respectively. As revealed by the results of the multiple linear regression, the variables of female's age ($B = -0.266, P < 0.001$), male's educational level ($B = 3.914, P = 0.004$), female's sleep disorder ($B = 3.780, P = 0.033$), The storage symptom of IPSS (IPSS-S) ($B = -0.510, P = 0.005$) and IIEF Erectile Function sub-score (IIEF-EF) ($B = 4.553, P < 0.001$) were the final predictors of their "women's sexual function". ($R^2 = 0.595, \text{ADJ. } R^2 = 0.579, R = 0.772$).

Conclusions: The results of the present study confirm the negative effect of BPH on women's sexual function. Given that, the variables of female's age and male's educational level from the socio-demographic factors, female's sleep disorder from the factors related to BPH, IPSS-S from the IPSS and IIEF-EF from the IIEF were the final predictors of "women's sexual function." Therefore, the condition of men's disease has a significant impact on their spouses' sexual function, and thus, it is necessary to support and pay attention to the spouses of patients. In addition, it is essential to incorporate the concept of women's sexual health with BPH-afflicted husbands into health providers' retraining programs.

Keywords: Women's health, Sexual health, Spouses, Prostatic hyperplasia, Lower urinary tract symptoms

Introduction

Women's sexual dysfunction (WSD) is one of the most important health problems that has been studied as a category of mental disorders in scientific literature. Based on the definition of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), sexual dysfunction (SD) is a heterogeneous group of disorders that is usually associated with a significant clinical disorder in the ability to respond sexually or the sexual experience of a person (1,2). SD in women involves orgasmic dysfunction, pain during intercourse, sexual desire disorder, and sexual arousal disorder (3). A healthy and satisfying sex life is one of the important components of women's well-being (3). Therefore, the occurrence of any disorder in women's sexual function leads to

the occurrence of anxiety, depression, communication breakdown, and disruption in personal relationships (4). In this way, WSD can have a considerable economic burden on society's health system (5). The prevalence of SD varies in different regions of the world. Based on the results in Iran, SD affected about 27.3% of women. Disorder in sexual desire was the most prevalent 35% form of SD, and Pain during intercourse and disorders in sexual orgasm were reported as 35.5% and 20.1%, respectively (6). In the same direction, Safarinejad reported the prevalence rate of WSD as about 25%-63%. In this study, racial, ethnic, and cultural differences and traditions governing the society are demonstrated as factors of the difference in the prevalence of sexual disorders among countries (7). A variety of factors, including mental

Received 23 November 2023, Accepted 17 August 2024, Available online 13 February 2025

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Key Messages

- ▶ The results of the present study confirm the negative effect of BPH on the sexual function of Iranian women.
- ▶ The age of the female and the educational level of the male were identified as socio-demographic factors that predicted the sexual function of women with spouses who had BPH.
- ▶ The sexual function of women with BPH-afflicted spouses was predicted by The IPSS.
- ▶ The female sleep disorder was identified as one of the factors associated with BPH that predicted the sexual function of women with BPH-afflicted spouses.
- ▶ The IIEF was used to predict sexual function in women with BPH-afflicted partners.
- ▶ It is advisable to integrate sex counseling into pre- and post-treatment programs, as couples' sexual function is significantly enhanced by appropriate counseling and increased sexual awareness.

health, sexual relationships, partner's sexual function, duration of the relationship, and chronic diseases, can affect women's sexual function (8). Because of some reasons, diseases are important factors in creating sexual problems (9). Chronic diseases not only have a profound effect on patients but also affect their spouses (10). The effect of these diseases is stronger in the patient's wife, and women are more sensitive to the chronic diseases of their husbands (11). According to the evidence, a spouse's illness reduces the quality of life of couples (12). In this regard, Laumann et al found that the probability of SD is higher in women who have not had a proper relationship with their spouses or who have not been able to express their sexual needs (13). Garraway also confirmed the importance of sexual life and sexual activity in patients with prostate symptoms (14). Benign prostatic hyperplasia (BPH) has an important role in couples' sexual health due to its association with SD (15). BPH, as one of the most common causes of lower urinary tract symptoms (LUTS), can lead to difficulty in urinating, urgency with leaking or dribbling, and nocturia, and also can impact quality of life (QOL), impair sexual function (16). BPH-related LUTS have been linked to SD. Erectile dysfunction (ED) and ejaculatory dysfunction (EjD) are two types of SD (17). ED has a significant impact on the physical and mental health (18), sexual function, and marital relationships of couples (19). Based on the evidence, the burden of LUTS goes beyond the affected person. The wives of men with BPH also suffer from significant complications, the most prevalent of which include psychological burden, inadequate sex life, and sleep disorder, which can be attributed to the symptoms of nocturia frequency and urgency/urge incontinence (20). Sells et al also found that 66% of women with BPH-afflicted spouses experienced a worsened sex life (21). On the other hand, despite the high prevalence of SD in couples with BPH-afflicted and requiring treatment, sexual adverse events (AEs) of the

treatments are not sufficiently evaluated, and AEs can negatively impact their QOL by causing SD (22). Given the fact that in the Iranian family culture, the marital sexual relationship is a completely personal and private matter, treatment programs and medical and care follow-ups of patients are often not discussed (23). Additionally, it is important to acknowledge that women's attitudes toward sex are incorrect in numerous cultures. Consequently, they refrain from discussing their issues, although they have numerous issues (24). Moreover, the desire to have sexual relationships by women through requesting or showing interest is considered inappropriate. Also, the husband's preferences and satisfaction with sexual relationships are considered more important than the wife's (25). Additionally, the role of the spouse is still ignored by urologists (26). However, it is important to note that male-origin SD in marital life can be treated more successfully when it finds a couple's identity (27). And so, in a holistic approach, the central role of the sexual partner is considered for evaluation and treatment (28). Unfortunately, the high prevalence of BPH in Iran (29) has imposed a heavy burden of the disease on the health system, and it will increase health-related costs (30). Despite the high prevalence of sexual disorders in women, not much attention has been paid to them, and few of these women seek medical treatment (31). Social, cultural, and economic factors are involved in referring these people to treatment, and the lack of proper treatment leads to the chronicity of symptoms and the development of mental disorders and finally deprives the couple of peace and comfort (13). The sexual health of women whose partners suffer from BPH requires particular attention. Therefore, there was a need to conduct a cross-sectional study to determine the status of sexual function and its affecting factors in Iranian women with BPH-afflicted spouses.

Patients and Methods

Study Design and Participants

The current research was based on the STROBE checklist, which is a tool for evaluating the quality of observational studies (32). The participants were women with BPH-affected spouses whose BPH was diagnosed by referring couples to Urology clinics of hospitals affiliated with Shahid Beheshti University of Medical Sciences in Tehran from September 7, 2022, to March 19, 2023, according to their medical history, clinical examinations, and paraclinical findings.

Inclusion and Exclusion Criteria

Inclusion criteria were the completion of the informed consent form by couples, Iranian couples with 40-year-old and older BPH-afflicted spouses, literacy, the diagnosis of the disease by a urologist (Diagnosis BPH included 1-Digital rectal examination (DRE); 2- Laboratory studies including urinalysis, urine culture, prostate-specific antigen (PSA); 3- Ultrasonography [abdominal,

renal, transrectal]) (33), the patient that was undergoing expectant treatment or drug therapy, being not candidates for surgery or being in post-surgery period, and no history of acute or chronic physical diseases such as diabetes, heart disease, kidney disease, addiction, connective tissue diseases and the use of drugs that affect sexual activity (such as antidepressants, neurological and antipsychotics), according to the couples themselves. The exclusion criteria included the couples' unwillingness to attend and continue the study and not completing the questionnaires completely.

Sampling

This descriptive-correlational study was conducted in Urology clinics of hospitals affiliated with Shahid Beheshti University of Medical Sciences in Tehran-Iran. Considering $\alpha = 0.05$, $d = 1$, and $z = 1.96$ and based on the standard deviation of the sexual function score obtained from previous studies ($\sigma = 5$) (34), the sample size was determined to be 96 couples. Taking into account the probable 10% drop, 105 couples were included in the study using a multi-stage sampling method through the following formula:

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

To select the sampling locations, first, the Urology clinics of Shahid Beheshti University of Medical Sciences were divided into four categories, and from each category, the clinics with the most referrals were selected. The sample size in each clinic was determined by quota method and taking into account the number of clients (number of samples 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 ultimately, sampling was done in the clinics by using a convenience sampling method. Then, in each clinic, the samples were selected to represent the society as much as possible and appropriate to the research purposes. If one of the couples left the study or did not answer 10% of the questionnaire, the sample was eliminated, and a new couple was replaced.

Instrument and Measures

The following tools were used in this study:

Socio-demographic questionnaire: It contained 16 questions for women and 27 for men regarding personal and social information and BPH. The validity of the questions was confirmed using content validity and the opinions of 10 professors of obstetrics and urology.

FSFI Questionnaire: This 19-item questionnaire was designed by Rosen et al to measure women's sexual function in six domains, including sexual desire (questions number 1–2), sexual arousal (questions number 3–6), lubrication (questions number 7–10), orgasm (questions

number 11–13), satisfaction (questions number 14–16) and pain (questions number 17–19). The domains are assessed using a response range from zero or one to five, where a score of five indicates better sexual function (1–5 and 0–5 for questions 1–2 and 3–19, respectively). 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 (last 4 weeks) (35). In Iran, the construct validity of the tool was confirmed through exploratory factor analysis, and its reliability was assessed using the retest method, with an R-value of 0.71 (36).

International Prostate Symptoms Score (IPSS) Questionnaire: The IPSS questionnaire comprises eight questions, seven regarding the symptoms for the preceding last 1 month and one assessing the QOL. The seven questions assessing the symptoms include IPSS-S, the storage or irritative symptom (voiding frequency, urgency, and nocturia), and IPSS-V, the voiding or obstructive symptom (incomplete emptying, intermittency, weak stream, and straining). Each symptom is assigned a score from 0 to 5 for a maximum of 35 points. The scores of these seven questions are added to determine the severity of the patient's urinary symptoms: mild - 0-7, moderate - 8-19, and severe - 20-35. The eighth question assesses the quality of life (IPSS-Q) and is assigned a score of 0-6, with 0 and 6 indicating the best and the worst QOL situation, respectively. The tool's validity and reliability have been confirmed by Barry et al (37). Panahi et al have confirmed the tool's validity and reliability in Iran (38).

IIEF Questionnaire: This questionnaire is composed of 15 questions (Q1–15) and five domains: erectile function (Q1–5, 15), orgasmic function (Q9, 10), sexual desire (Q11, 12), intercourse satisfaction (Q6–8), and overall satisfaction domain (Q13, 14) (39,40). A higher score indicates better sexual performance, with a maximum acceptable score of 75, representing the best sexual status across different areas (41). The erectile function domain of the IIEF-15 questionnaire has been validated as a diagnostic tool in the clinical setting for grading degrees of severity of ED and for distinguishing between men with and without ED (39,40). Through the IIEF-15, ED can be classified based on the erectile function (EF) domain as follows: no ED (EF score 26–30), mild ED (EF score 22–25), mild to moderate (EF score 17–21), moderate (EF score 11–16), and severe ED (6–10). The validity and reliability of the original version were confirmed by Rosen et al (41). In Iran, the construct validity and construct reliability of the tool were confirmed by Pakpour et al (42).

Statistical Analysis

The extracted data were statistically analyzed using SPSS version 20. The regression model's assumptions were initially assessed to evaluate the multiple linear regression

test. To this end, univariate regression was examined where the dependent variable was the score of WSD dimensions, and the variables with a significant level of $P < 0.05$ were the independent variables that entered the initial multiple linear regression model. Considering that the problem of multicollinearity was not observed between the independent variables and all the conditions of the regression model were met, a Stepwise multiple linear regression test was used.

Results

Analyses were evaluated for 105 couples, and the participation rate was calculated to be 100%. The mean and standard deviation age of women and their husbands were 55.41 ± 14.19 and 61.82 ± 12.22 years, respectively. The demographic characteristics of the research subjects are presented in (Table 1). The mean and standard deviation of the scores of different dimensions of females' sexual function and their sub-scales are shown in (Table 2).

Table 1. Variables of the Socio-demographic Factors and Factors Related to BPH in 150 Iranian Women With BPH-Afflicted Spouses

Variables	Mean \pm SD/n (%)
Socio-demographic Factors	
Male's age (y)	61.82 \pm 12.22
Female's age (y)	55.41 \pm 14.19
Age difference (y)	9.36 \pm 9.62
Male's BMI (kg/m ²)	26.81 \pm 3.13
Duration of marriage (y)	33 \pm 17.56
Male's 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)
Dissatisfied	25 (23.8)
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)
BPH Factors	
Medication use	
Continuous	72 (68.57)
Drug discontinuance	33 (31.43)

Table 1. Continued

Variables	Mean \pm SD/n (%)
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 (mon)	69.51 \pm 67.30
PSA level at the last test (ng/mL)	7.56 \pm 5.69
Prostate volume at last test (mL)	85.17 \pm 36.23
Age at the onset of the disease (y)	58.2 \pm 9.12
Duration of medication use (mon)	12.08 \pm 3.48
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 of 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's 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 actions for treatment of sexual problems	
Yes	41 (39)
No	64 (61)
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)

Table 2. The Mean (SD) of the FSFI and Their Sub-scales Scores in 150 Iranian Women With BPH-Afflicted Spouses

Variables	Subscales	Mean (SD)	Score out of 100	Range of Scores
FSFI ^a	FSFI-D	3.84 ± 1.51	64	1.2-6
	FSFI-A	3.40 ± 1.88	56.66	0-6
	FSFI-L	3.92 ± 1.98	65.33	0-6
	FSFI-O	2.78 ± 1.80	46.33	0-6
	FSFI-S	4.02 ± 1.76	67	0.8-6
	FSFI-P	3.67 ± 2.14	61.16	0-6
	FSFI-T	21.64 ± 9.95	60.11	2-36

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 vaginal penetration; FSFI-S: FSFI Satisfaction sub score: Female's satisfaction with the amount of closeness with a partner and sexual relationship and overall sex life; FSFI-T: Total FSFI.

^a The sexual function of the study women according to the cut-off point of 28 for the whole scale and sub-scales was as follows: sexual desire: 3.3, sexual arousal: 3.4, vaginal lubrication: 3.4, the peak of sexual pleasure: 3.4, sexual satisfaction: 3.8 and pain: 3.8.

The mean and standard deviation of IPSS and sub-scales are shown in (Table 3). The results of univariate linear regression are also offered in (Table 4). Then, to measure the effect of socio-demographic factors, sexual function of men, and factors related to BPH and IPSS on female sexual function, multiple linear regression was used, and the significant variables of linear regression were entered into the model. Based on the results of multiple regression, 58% of the variance of the overall score of "women's sexual function" could be explained by five predictable variables. Given the fact that ($R^2 = 0.60$), 40% of the changes were affected by factors and variables outside the study and 60% of the remaining changes in "women's sexual function" were caused by the variables considered as independent variables in this study (Table 5).

Discussion

This study aimed to investigate the status of sexual function and its affecting factors in Iranian women with BPH-afflicted spouses. SD includes a complex interaction of physiological, psychological, and social factors, and the probability of SD is higher in women who have not had a proper relationship with their spouses or who have not been able to express their sexual needs (13). In line with the study by Mohammad Alizadeh Charandabi et al (43), in the present study, the BPH of men had a significant effect on women's sexual function.

Based on the results of the present study, the variables of female's age and male's educational level from the socio-demographic factors, female's sleep disorder from the factors related to BPH, IPSS-S from the IPSS and IIEF-

Table 3. The mean (SD) of the IPSS with its sub-scales score in 150 Iranian men with BPH- Afflicted

Variables	Subscales	Phrases	Mean ± SD	Score out of 100	Range of Scores	Scoring	No. (%)	
IPSS	IPSS-V	Incomplete bladder emptying	9.60 ± 6.11	48	1-20			
		Straining						
		Intermittency						
		Weak stream						
	IPSS-S	Frequency	6.92 ± 4.75	46.13	0-15			
		Nocturia						
		Urgency						
	IPSS-T			16.53 ± 10.76	47.22	1-35	Asymptomatic (0)	0 (0)
							Mildly symptomatic (1-7)	39 (37.1)
							Moderately symptomatic (8-19)	36 (34.3)
Severely symptomatic (20-35)							30 (28.6)	
IPSS-Q							If you were to spend the rest of your life with your prostate symptoms just as they are now, how would you feel about that?	4.06 ± 1.80
	Pleased	7 (6.7)						
	Mostly satisfied	15 (14.3)						
	Mixed (about equally satisfied and dissatisfied)	15 (14.3)						
	Mostly dissatisfied	14 (13.3)						
	Unhappy	17 (16.2)						
Terrible	34 (32.4)							

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

^a Given that 6 and 0 were the worst and the best quality of life scores, respectively, most men in the study were mostly dissatisfied with their quality of life.

Table 4. Univariate Linear Regression Between Variables of FSFI and the Socio-demographic Factors and Factors Related to BPH IPSS and IIEF

Variables	B	P value	FSFI	
			95% CI	
			Lower	Upper
Male's age (y)	- 0.470	<0.001 ^b	-0.600	-0.340
Female's age (y)	- 0.464	<0.001 ^b	- 0.567	- 0.361
Age difference (y)	-0.928	0.561	-4.082	2.226
Male's BMI (kg/m ²)	-0.482	0.122	-1.096	0.131
Duration of marriage (y)	-0.339	<0.001 ^b	-0.428	-0.251
Male' educational level (non-academic ^a)	7.616	<0.001 ^b	4.026	11.205
Female's educational level (non-academic ^a)	7.880	<0.001 ^b	4.327	11.432
Male's financial situation	10.322	<0.001 ^b	6.316	14.328
Female's financial situation	9.601	<0.001 ^b	5.461	13.740
Male's employment situation(Retired ^a)	2.473	0.208	-1.398	6.345
Female's employment situation (Housewife and retired ^a)	4.091	0.035 ^b	0.294	7.888
Living in a house (Yes ^a)	5.083	0.067	-0.359	10.525
Type of marriage (permanent ^a)	7.096	0.005 ^b	2.150	12.041
Duration of BPH (Mon)	-0.072	<0.001 ^b	-0.097	-0.047
PSA level (ng/mL)	-0.340	0.047 ^b	-0.675	-0.005
Prostate volume (mL)	-0.144	<0.001 ^b	-0.190	-0.098
Age at the onset of the disease (y)	-0.537	<0.001 ^b	-0.722	-0.351
Duration of medication use (Mon)	-0.297	<0.001 ^b	-0.429	-0.165
Male's fear of prostate surgery (Yes ^a)	3.385	0.088	-0.511	7.281
Female's fear of prostate surgery (Yes ^a)	-3.075	0.134	-7.109	0.958
Male's fear of prostate cancer (Yes ^a)	5.227	0.014 ^b	1.066	9.389
Female's fear of prostate cancer (Yes ^a)	4.725	0.015 ^b	0.934	8.516
Male's fear of sexual side effects medication use (Yes ^a)	-13.384	<0.001 ^b	-16.835	-9.934
Male's concern about health status (Yes ^a)	-6.495	0.016 ^b	-11.730	-1.260
Female's concern about her husband's health status (Yes ^a)	-0.662	0.736	-4.553	3.229
Male's action for treatment of sexual problems (Yes ^a)	0.348	0.861	-3.575	4.270
Female's action for treatment of sexual problems (Yes ^a)	0.170	0.932	-3.797	4.138
Male's depression disorder (Yes ^a)	9.199	<0.001 ^b	5.641	12.757
Female's feeling embarrassed from husband disease (Yes ^a)	7.355	<0.001 ^b	3.690	11.020
Male's sleep disorder (Yes ^a)	11.459	<0.001 ^b	8.252	14.667
Female's sleep disorder (Yes ^a)	12.197	<0.001 ^b	9.140	15.253
Disorder in male's social life (Yes ^a)	10.709	<0.001 ^b	7.017	14.401
Disorder in female's social life (Yes ^a)	8.211	<0.001 ^b	4.665	11.758
The reason for visiting the doctor (Storage & Voiding ^a)	2.361	0.385	-3.006	7.727
Type of medication treatment (waiting ^a)	-10.681	<0.001 ^b	-15.980	-5.383
Situation of medication use (Continuous ^a)	3.836	0.055	-0.079	7.751
IPSS-V	-1.035	<0.001 ^b	-1.280	-0.789
IPSS-S	-1.302	<0.001 ^b	-1.623	-0.981
IPSS-T	-0.587	<0.001 ^b	-0.727	-0.448
IPSS-Q	-3.250	<0.001 ^b	-4.121	-2.378
IIEF-EF	1.519	<0.001 ^b	1.053	1.985
IIEF-IS	2.750	<0.001 ^b	1.764	3.737
IIEF-OF	4.104	<0.001 ^b	2.765	5.442
IIEF-SD	4.961	<0.001 ^b	3.253	6.669
IIEF-OS	7.082	<0.001 ^b	5.951	8.213
IIEF-T	0.701	<0.001 ^b	0.506	0.897

^aReference group.^bEstimated unstandardized regression coefficients with 95% CI; *P* < 0.05 is significant

Table 5. Multivariable Linear Regression Between the Variables FSFI and the Socio-demographic Factors and Factors Related to BPH IPSS and IIEF

Model ^a		B	SE	Beta ^b	P Value	95% CI	
						Lower	Upper
Constant		32.393	5.345		<0.001	21.789	42.996
The Socio-demographic factors	Female's age	- 0.266	0.059	- 0.380	<0.001	- 0.384	-0.149
	Male's educational level	3.914	1.342	0.197	0.004	1.253	6.576
IPSS	IPSS-S	- 0.510	0.176	- 0.244	0.005	-0.859	-0.162
The factors related to BPH	Female's sleep disorder	3.780	1.753	0.191	0.033	0.302	7.257
IIEF	IIEF-EF	4.553	2.192	0.286	<0.001	2.064	3.725

^a The presented regression model was significant ($P < 0.001$). Durbin-Watson = 1.634, $R^2 = 0.595$, ADJ. $R^2 = 0.579$, $R = 0.772$.

^b According to the (Beta) value, the age of the female (- 0.380) had the biggest contribution in changing "women's sexual function." Then, the variables IIEF-EF (0.286), IPSS-S (-0.244), male's educational level (0.197), and female's sleep disorder had the most significant effects, respectively (0.191).

EF from IIEF were the final predictors of "women's sexual function."

In the present study, if all variables remained constant, each year of increase in female age decreased the score of "women's sexual function" by 0.266 units. In our study, the highest frequency distribution was 21.9%, which belonged to 50 to 59-year-old women. Graziottin et al also indicated that the SD of women increased with the increase in their age (44). In our study, BPH was added to the main biological factors that cause SD in women and led to the aggravation of this disorder. In the present study, under the condition that all variables remained constant, any increase in the male's educational level increased the score of "women's sexual function" by 3.914 units. In our study, two-thirds of the couples did not have an academic education, and thus, many of their sexual problems were caused by a lack of knowledge, misconceptions, or the inability to express their sexual preferences, and incorrect information about sex (45). As no study was found in this regard, we were content with the results of a study finding a positive relationship between the level of education of women and their sexual function (46). Thus, higher education of men in our study could improve the sexual function of their wives by promoting their knowledge of sexual issues and relationships and understanding of the physical, psychological, and emotional needs of their wives. In our study, under the condition that all variables remained constant, "women's sexual function" with no sleep disorder following BPH-husband was improved approximately by 3.780 units, 47.6% of the women in the present study suffered from sleep disorders, and based on other studies, a significant proportion of the wives of men with LUTS reported sleep disorders and detrimental effects on relationships and sexual activity (20,21). These results are in line with the results of our study. Moreover, physical and mental exhaustion caused by sleep disorder has been mentioned as one of the risk factors for decreased sexual pleasure and SD (47). Finally, for each unit of increase in IPSS-S score, in case all variables remained constant, the score of "women's sexual function" decreased approximately by .510 units. The men's mean score of IPSS-S in the present study was 6.92 and ranged from 0 to

15, and SD increased in some females in the study. Based on the evidence, the burden of LUTS goes beyond the affected person. The wives of men with BPH also suffer from significant complications, the most prevalent of which include psychological burden, inadequate sex life, and sleep disorder, which can be attributed to the symptoms of nocturia frequency and urgency/ urge incontinence (20). In a study similar to the present study, 42% of women were exhausted during the day that was due to waking up at night, and 66% experienced a worsened sex life (21). The present study's findings indicate that, while holding all other variables constant, for every increase in the IIEF-EF score, there was an average increase of 4.553 units in the "women's sexual function" score. Any cause for ED significantly decreases all of the total FSFI score, including sexual desire, arousal, orgasm, and satisfaction of women (48). Mohamadkhani Shahri et al also indicated that ED has a negative effect on sexual quality of life of the patients and their partners as well as on their satisfaction with the relationship (49). In the current study, approximately 45% of men were found to have a low erectile function score. Also, the use of 5 α -Reductase Inhibitors (5 α -RIs) leads to many men experiencing ED, EjD, and decreased libido (50). Moreover, nocturia also had a direct relationship with ED (51). Thus, ED affects the mental, physical, and sexual health of patients and their wives (52).

Strengths and Limitations

Despite having several strengths, this study also had some limitations. First of all, examining the women's sexual function was performed at a specific point in time. Also, it was impossible to perform specialized examinations for the presence of mental illnesses and to rely on the participants' self-reports. One of the other limitations of our study was that the study relies on self-reported data, which may introduce recall bias or social desirability bias. In addition, IPSS was associated with some limitations (37). To solve this problem, the urologist performed a complete physical examination, including a DRE, and determined the free and total PSA levels serum and urine analysis to diagnose BPH. Also, the IIEF has potential disadvantages (41). Finally, this study is conducted in an

Iranian population, and cultural factors may influence sexual function and its predictors. The strengths of the study were the use of IIEF (41) and FSFI (35) standard questionnaires.

Conclusions

Based on the results of the present study, 60% of the changes in “women’s sexual function” with BPH-afflicted husbands were caused by the variables of female’s age, male’s educational level, female’s sleep disorder, IPSS-S, and IIEF-EF. Therefore, the condition of men’s disease has a significant impact on their spouses’ sexual function, and thus, it is necessary to support and pay attention to the spouses of patients. Also, women with BPH-afflicted husbands worry about the presence of cancer and the consequences of surgical intervention on them. Consequently, it was suggested in our study that the benign nature of the disease, its effect on sexual function, and the result of different treatment approaches should be discussed in the presence of the patient’s spouse. It is strongly recommended that health policymakers in the country prioritize the significance of women’s sexual function and its association with the overall health of couples with BPH-afflicted spouses in educational programs. Moreover, it is essential to incorporate the concept of women’s sexual health with BPH-afflicted husbands into retraining programs. By doing so, healthcare professionals can enhance their awareness and knowledge regarding sexual health, enabling them to support patients who are BPH-afflicted and their wives better. Finally, considering the high costs of BPH in the future because of the aging population, a systematic management and strategic approach need to be planned for BPH.

Directions for Future Research

Further studies are warranted in the future to validate the impact of these factors on the sexual function of Iranian women with BPH-afflicted spouses and explore other potential factors influencing it. In addition, this study was conducted as a descriptive study, examining the sexual function of women in Iran at a specific time. Consequently, conducting longitudinal studies would provide more comprehensive insights into the factors influencing the sexual function of these women.

Authors’ Contribution

Conceptualization: Leila Mohamadkhani Shahri, Zohreh Keshavarz, Malihe Nasiri.

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Conflict of Interests

Authors declare that they have no conflict of interests.

Ethical Issues

This study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences in Iran on September 2022-09-06 (Reference no: IR.SBMU.PHARMACY.REC.1401.126). After explaining the study’s objectives to the participants and if they were willing to participate and met the inclusion criteria, the researcher completed a written informed consent form for them. The researcher completed all questionnaires in person and two sessions in separate rooms. Also, the participants could withdraw from the study at any stage, and their information remained confidential.

Financial Support

This research has received support from Vice-Chancellor in Research Affairs -Shahid Beheshti University of Medical Sciences.

Acknowledgments

This study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences as a part of the Ph.D. thesis of Leila Mohamadkhani Shahri, Ph.D. student of reproductive health at Shahid Beheshti University of Medical Sciences. The authors thank all couples participating in this work and the Vice-Chancellor in Research Affairs -Shahid Beheshti University of Medical Sciences.

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