Factors Related to Quality of Life Among Persons with Benign Prostatic Hyperplasia in Wenzhou, China: A Cross Sectional Study

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Abstract

The aim of this research was to describe quality of life (QOL) and examine its relationship with the severity of lower urinary tract symptoms (LUTS), sleep disturbance, depression, and social support among the persons with Benign Prostatic Hyperplasia (BPH) in Wenzhou, China. A simple random sampling technique was used to recruit 100 individuals with BPH, who came to follow up on their health at the Urological Clinic outpatient department of the Second Affiliated Hospital of Wenzhou Medical University in Wenzhou, China. Research instruments included the demographic data questionnaire, the International Prostate Symptoms Score, the Verran and Snyder-Halpern Sleep Scale, the Geriatric Depression Scale-15, the Social Support Rating Scale, and the revised version of the Quality of Life Scale for BPH Patients, with Cronbach's alpha values of 89, 92, 79, 88, and 94, respectively. Data was analyzed by descriptive statistics and Pearson's correlation.

The results of this study showed that the mean score of QOL of BPH persons was 102.2 (SD = 12.9) out of 160. There was a significant positive relationship between social support and QOL among persons with BPH ($r = .485$, $p < .001$). Severity of LUTS ($r = -.736$, $p < .001$), sleep disturbance ($r = -.553$, $p < .001$), and depression ($r = -.670$, $p < .001$) had a negative relationship with QOL among them.

The findings in this study could make nurses and other health care providers have a better understanding towards the QOL of BPH persons in Wenzhou, China. Moreover, the results are useful for the development of effective interventions to reduce depression, sleep disturbances, LUTS, and increase social support, then improve the QOL of BPH persons.

Key words: Benign prostatic hyperplasia, quality of life, lower urinary tract symptoms, social support, sleep disturbance, depression

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Introduction

Benign prostatic hyperplasia (BPH) is one of the most common diseases of the urinary system. It is a chronic disease mainly occurring in elderly men. According to the advent of an aging society, the number of older males with BPH is increasing year by year, and in the United States, over 15 million men have diagnosis of BPH (Egan, 2016). As reported by Chinese epidemiological statistics, the prevalence rate of BPH of men age <60 is 45%, age 61-70 is 70%, and that of men age 81-90 is 90% (Xiong et al., 2020). Although BPH is not life-threatening, however it poses a serious threat to the QOL of patients (Park et al., 2020). Long-term low QOL not only reduces the happiness of persons with BPH and their family members, but also is not conducive to promoting the development of healthy aging of the elderly male globally, including in China (Alcaraz et al., 2016).

QOL is a term to comprehensively evaluate the quality of human life. The World Health Organization (WHO) defines the QOL as the living experience of people in different cultural value systems towards their goals, expectations, standards, and things they care about, including physical, psychological, social functions, and material states. The surveys in China have found that among the chronic diseases affecting the QOL of an elderly male, the prevalence rate of BPH is ranked the first approximately 74.33%, which is more than high blood pressure (56.41%), diabetes (19.02%) and other diseases (Yang & Yongxue, 2015; Ma et al., 2015). Therefore, BPH has become the primary chronic disease endangering the QOL of elderly male. Some literature has been reported that the QOL among BPH persons is medium or low (Pan et al., 2020; Fan, 2022).

BPH is a progressive disease, with the development of a bladder obstruction caused by hypertrophy of the prostatic gland. These groups of patients with meaningful obstruction and moderate symptoms should be living with the clinical manifestations of BPH. About 60% of the patients with low-stage disease was affected by BPH symptoms (Wang & Foo, 2010). Although, transurethral resection of the prostate (TURP) and Holmium laser nucleation of the prostate operation method in the clinical treatment of prostate hyperplasia can quickly resolve urinary tract symptoms. However, these treatments will consider for BPH patients in stage 4, who had complications caused by BPH, such as urinary retention, bladder stone formation, and recurrent urinary tract infections. Thus, there are a large amount of BPH persons that waiting for the treatment process of TURP, moreover living and coping with lower urinary tract symptoms (LUTS). So, the main purpose of caring for BPH persons in stage 2-4, before receiving operation, are to relieve LUTS and further improve the QOL.

LUTS encompasses various abnormal manifestations in the urination cycle caused by changes in the structure and function of the lower urinary tract, including symptoms during storage, urination, after urination and other abnormal symptoms in the urine storage phase include frequent urination, urge incontinence, increased nocturia, and impaired mental health (Wein, 2020). Frequent nocturnal urination also leads to sleep disturbance in the elder and affects the QOL of BPH sufferers. Previous studies suggested that sleep disturbance was an independent risk factor affecting QOL in older persons (Fan, 2022; Ning, 2020). In relation to mental health issues, severity and incidence of depression in BPH patients was higher than that in the general population (Kaplan, 2012; Rom et al.,

2017). The effect of negative depressive symptoms becomes more pronounced over time, leading to a decline in the QOL of a person with BPH.

Among the factors related to the QOL, social support has a pronounced effect on QOL. A person with BPH with low social support tends to have worse QOL (Mutalip et al., 2020). Social support can provide a certain sense of security to cope with stress, reduce negative emotions, reduce the pain of disease in both spiritual and material aspects, and enhance confidence to face one's illness, which is a positive external protective factor. The lack of timely, accurate and long-term psychological support and nursing for patients with BPH and their families leads to strong stigma, poor compliance, and weakened treatment effects, resulting in delayed improvement of the patient's condition, poor social adaptability, and decreased QOL (Liu, 2020).

From the literature review, LUTS, sleep disturbance, depression, and social support are correlated with QOL among persons with BPH. However, there are few specific studies on the QOL of BPH patients and its related factors in China. Based on Symptom Management Theory, this study explored the relationship between LUTS, sleep disturbance, depression, and social support with QOL of persons with BPH. This research results should provide useful information for health care providers in Wenzhou to develop nursing interventions to care for BPH patients, to support and guide them to effectively carry out disease management to improve health outcomes and their QOL.

Research objectives

1. To describe QOL among persons with BPH in Wenzhou, China.
2. To determine the relationship between severities of LUTS, sleep disturbance, depression and social support with QOL among persons with BPH in Wenzhou, China.

Research hypothesis

1. There is a negative correlation between severity of LUTS, sleep disturbance, depression and QOL among persons with BPH in Wenzhou area
2. There is a positive correlation between social support and QOL among persons with BPH in Wenzhou area

Conceptual Framework

Symptom Management Theory (SMT) describes symptom management as a multidimensional process. Symptom management consists of three factors that influence each other: symptom experience, symptom management strategy, and outcomes. In the 2019 revised version, the four elements covered by nursing were added to it, namely: person, environment, health, and disease (Hickey et al., 2019). Person, environment, and health/illness will directly or indirectly affect symptom experience, symptom management strategies, and QOL outcomes (Dodd et al., 2001). When factors related to symptom management are identified, effective intervention can be taken to improve a patient's QOL.

According to SMT and the related literature, LUTS, sleep disturbance, and depressive symptoms are common symptoms perceived to be experienced by the BPH sufferer. Symptom experience consists of three dimensions: perception, evaluation, and response (Fangming & Jianhua., 2012). Symptom perception refers to the patient's cognition of symptoms, symptom evaluation refers to the patient's evaluation of the cause and severity of symptoms, as well as the evaluation of symptoms on mood and life. Symptom response refers to the patient's physiological, psychological, social, and other behavioral reactions caused by symptoms. This can often lead to the enhancement of the body's perception of symptoms, such as the increased dependence on family and society. The patient's perception of LUTS, such as frequent urination, urgent urination, painful urination, increased nocturnal urination, etc., sleep disturbance, and depressive symptoms are often reported by persons with LUTS. Social support is in the environment domain, and was selected to examine the relationship with QOL of the person with BPH. SMT has the advantage of being comprehensive, multidimensional, measurable, dynamic, and emphasizes that all objects, including patients themselves and their environment need to be managed.

Methods

This study was a descriptive correlational research design.

Population and sample

The target population of this study is men with BPH, who were treated in the Urology OPD of the Second Affiliated Hospital of Wenzhou Medical University in Wenzhou, China. The sample included persons with BPH who came to Urology OPD of the for follow-up of their condition. Simple random sampling was used to recruit the sample, using the following inclusion criteria: 1). Diagnosed BPH with Stage 2-4 2). No history of surgery for transurethral resection of the prostate 3). Age 50 years or older 4). No history of cancer 5). Be able to write and speak Chinese 6). Orientated to place and time 7). No history of mental illness (from the medical history) 8). No history of physical disability which requires assistance for daily living.

Sample size

The Thorndike formula (1978) was used to calculate sample size in this study. The formula is given by n = 10k+50 (where n is required sample size and k is number of independent variables). Since there are four independent variables in the current study, the sample size required is at least 90. Considering possible potential outlier data, the desired sample size was increased by 10% from the prescribed result (Martínez-Mesa et al., 2014). Thus, the final sample size was 99. In this study the researcher collected data from 100 cases.

Research Instruments

1. Demographic questionnaire was designed by the researcher. There are 2 parts, part 1 contains information about the participants' characteristics, such as age, education level, marital status, living condition, current occupation, household income. Part 2 of the questionnaire contains health information of participants such as duration of BPH diagnosis, stage of BPH, co-morbidities,

frequency of voiding the bladder at daytime and nighttime, history and presence of alcohol consumption, reason for drinking, and ever been drunk. The information in Part 1 was obtained by patient interview and self-report, while the information in Part 2 was obtained from the medical records.

2. The International Prostate Symptom Score (IPSS) was used to measure the severity of LUTS among the participants. It was originally developed by the American Urological Association (Barry et al., 1992). The IPSS was translated into Chinese by the Hong Kong Urological Association (HKUA) in 1995 (Martínez-Mesa et al., 2014). The score was based on answering seven questions about urination symptoms, and each item had six response options: 0, 1, 2, 3, 4, 5: A score of 0 denotes no symptoms and a score of 5 denotes very serious symptoms. The total potential score ranges from 0 to 35. A score of 0-7 indicates mild symptoms, 8-19 indicates moderate symptoms, and 20-35 indicates severe symptoms (Choi & Son, 2019). IPSS has high reliability with the Cronbach's alpha was .90 (Wong et al., 2017). In this study Cronbach's alpha was .86.

3. The Verran and Snyder – Halpern sleep scale (VSH) was used to measure sleep disturbance among the BPH persons. The VSH was developed by Snyder-Halpern and Verran (1987), translated and validated to Chinese by Lin and Tsai (2003). The VSH was administered to measure a patient's magnitude and self-reported quality of sleep during the preceding night. VSH comprises 15 items: 8 items about sleep disturbance, 4 items about effectiveness of sleep, and 3 items about sleep compensation. The total score of this instrument was calculated by sum score of all items. Each item on the scale contains a visual analogue response on 10 centimeters. In every item, there are words that explain the meaning of 0 to 10 scores. Items 2, 7, 12, and 14 are reversed scored. The total potential score ranges from 0 to 150. Moreover, to describe the level of sleep disturbance, the score ranges from 0-50 = mild sleep disturbance, 51 - 100 = moderate sleep disturbance, and 101-150 = high sleep disturbance (Zhang et al., 2020). VSH Cronbach' alpha coefficient was .82 in the original version (Snyder-Halpern & Verran, 1987) and .83 in the Chinese version (Lin & Tsai, 2003). In this study Cronbach's alpha was .92.

4. The Geriatric Depression Scale (GDS-15) was used to measure the depressive symptoms of the BPH person. The scale was developed by Sheikh and Yesavage (1986), considering the characteristics of the older adults. GDS-15 was translated to Chinese and validated by Mei Jin Rong (1999). GDS-15 was used to evaluate the depression status of the participants in the last week, thoughts of low mood, reduced activity, irritability, withdrawal from others, and pain, as well as their negative evaluation of the past, present and future. This scale asked for an answer "yes" or "no". The items 1, 5, 7 and 11 connote negative meaning: An answer 'No' was scored 1 point, while 'Yes' was scored 0 points; the items 2,3,4,6,8,9,10,12,13,14 and 15 connote positive meaning: An answer 'No' was scored 0 points; 'Yes' was scored 1 point. The highest potential score is 15 points; the higher the score, the more obvious the depressive symptoms; a score ≥8 means having depressive symptoms. The GDS-15 was tested for reliability the results the Cronbach's alpha was .82 (Mei, 1999), and .79 (Dan, 2013). In this study Cronbach's alpha was .92.

5. The Social Support Rating Scale (SSRS) was used to measure social support of the BPH person. The SSRS was published by Xiao Shuiyuan (Xiao, 1994), with 10 items. The response to items 1-4 and 8-10 was 1-4 points; 1, the response is given 1 point; if 2, response is given 2 points; 3, 3 points; 4, 4 points. However, items 5 had five subitems of A, B, C, D and E, and the scores are also from 1 to 4 for each subitems which are represented as 1= no support and 4= full support. For Items 6 and 7, if the answer is "without any source" the response is given 0 points, and if the answer is "the following sources," then the person chooses several sources. If the person chooses three sources, the response is given 3 points; four sources are given 4 points, the highest point score is 9 for each item. The total score of the scale is the sum of the 10 items, with a maximum potential score of 66. The higher the mean score, the higher the level of perceived social support. Moreover, score ≤22 points = low level perceived social support, score 23-44 points = medium level perceived social support, and score ≥45 points = high level perceived social support (Li et al., 2021). In this study Cronbach's alpha was .89.

6. Revised BPH QOL Scale was used to measure the QOL of BPH persons. The QOL scale including five dimensions: disease, physical, social, psychological, and satisfaction. The scale adopts a five-point equidistant score which includes "none at all", "a little", "medium", "serious" and "very serious". The score is 5, 4, 3, 2, and 1 point, respectively. Shi et al. (2004) developed a BPHQLS scale suitable for China's national conditions, consisting of five same dimensions with a total of 74 items). Guo et al. (2008) revised the scale and modified it from 74 to 33 items which was simpler and clearer. Of the 32 items, all are reverse items; Item 33 is a self-evaluation of the overall feeling, which is a subjective question. The minimum total mean score is 32 and the maximum total mean is 160. The scoring index was calculated as follows: the true score of the scale/the highest possible score of the scale X 100%. For example: the QOL total score = the patient's measured score/160 points (total score of 160 points) x100%. Score: >66% = high QOL; 66%-33% = moderate QOL ;<33% = low level QOL. The score of the disease dimension is 75 points: physiological dimension 20 points, social dimension 25 points, psychological dimension 30 points and satisfaction dimension 10 points. The total score of each dimension is different, so it cannot be compared with the score of each dimension alone. Thus, the index of component number is converted for comparison. The Cronbach's alpha of the revised BPHQLS is .86 (Guo et al., 2008). In this study Cronbach's alpha was .89.

Protection of human rights

The research proposal got approval from IRB in BUU (IRB3-090/2564) and the Second Affiliated Hospital of Wenzhou Medical University. The researcher explained the study information included aims, procedures, occupied time to complete the questionnaire. Recruitment of participants was carried out purely based on volunteerism. Only those participants who were willing and consented to take part in the study were recruited. Data obtained from the study were kept strictly confidential.

Data Collection

Data were collected 5-10 samples per day from June to July 2022. With the help of the nurse of the urology outpatient department, the researcher got written consents from the participants who met the inclusion criteria on a voluntary basis, and questionnaires were distributed. Participants took approximately 30 minutes to complete the whole set of self-reported questionnaires in a special private room. Moreover, health information of the participants was obtained from medical records by researcher.

Data Analysis

The data were analyzed using SPSS 26. Descriptive statistics including frequency, percentage, mean (M) and standard division (SD) were used to describe demographic characteristics, and each variable. Pearson's product moment correlation was used to examine relationship between LUTS, sleep disturbance, depression, and social support with QOL among persons with BPH. The data were tested for normality and homoscedasticity outliers of the variables to verify the assumptions of Pearson's product moment correlation test.

Results

A total of 100 men with BPH participated in the study. The mean age of the participants was 67.8 years (SD = 7.5), with a range from 55 to 87 years. Three out of five participants were aged between 60 and 74 years. The majority of participants were married (90%), and 85% lived with their spouse. Two-thirds of participants (67%) resided in urban areas. One-third (34%) had completed junior high school or high school. Household monthly income ranged from ¥8,000 to ¥10,000 (US$ 1,190 - 1,488) for 45% of participants, while 28% had an average monthly income of more than ¥10,000 (≥ US$1,488). All participants (100%) had medical insurance. Of these, 33% were employed, while 60% were retired.

For the health information, the duration of BPH diagnosis among the participants ranged from 2 to 15 years (M = 3.7, SD = 1.8). Most participants were in Stage 2 (53%), and 46% were in Stage 3. All participants reported frequent urination, with 63% urinating 9-10 times per day and 28% urinating more than 10 times per day. Most participants also reported increased nocturia frequency, with 48% experiencing nocturia three times per night and 33% experiencing it four times per night. Three out of four participants had at least one co-morbidity, with hypertension (65%) being the most common. All participants were currently receiving BPH drug treatment, and 75% used a combination of two drugs (Tamsulosin hydrochloride and Finasteride) daily to control BPH. A total of 87% had a history of alcohol consumption, and 72% were currently drinking and had been drunk. Approximately two out of five participants (39%) reported drinking to help them sleep.

In this study, the BPHQOL scores ranged from 79 to 132, and the mean score was 102.2 (SD = 12.9). The scoring index was 63.9%, which indicates a moderate level of QOL, as shown in Table 1.

Table 1: Range, mean and standard deviation of QOL among persons with BPH (n = 100)

Dimension	Range		*M*	*SD*	Score index (%)
	Possible score	Actual score			
Total score	**32-160**	**79-132**	**102.2**	**12.9**	**63.9**
Disease	15-75	29-58	42.4	6.8	56.5
Physiological	4-20	11-19	17.8	1.5	88.8
Social	5-25	12-24	17.6	2.4	70.5
Psychological	6-30	12-27	18.4	3.7	61.5
Satisfaction	2-10	4-8	6.0	0.9	60.4

Score index = (mean/ maximum possible total score) X100%

Table 2: Range, mean and standard deviation of LUTS, sleep disturbance, depression, and social support among the participants (n = 100)

Variables	Range		*M*	*SD*	Interpretation
	Possible score	Actual score			
Severity of LUTS	0-35	5-29	19.3	5.0	Moderate
Sleep disturbance	0-150	37-92	60.8	11.0	Moderate
Depression	0-15	0-13	5.0	2.9	No depression
Social support	0-66	23-50	39.0	6.3	Moderate

The relationships between QOL and selected factors in persons with BPH are summarized in Table 3. The results show that the severity of LUTS (r = -.736, p < .001), social support (r = .485, p < .001), depression (r = -.670, p < .001), and sleep disturbance (r = -.553, p < .001) were significantly associated with quality of life (QOL) among persons with BPH.

Table 3: Correlation coefficient between severity of LUTS, sleep disturbance, depression, social support and QOL among persons with BPH (n = 100)

Factors	Correlation coefficient (r)
Severity of LUTS	-.736***
Sleep disturbance	-.553***
Depression	-.670***
Social support	.485***

***p < .001

Discussion

The findings of this study are discussed based on the research objectives and research hypothesis as follows.

QOL among persons with BPH

In this study, the mean score of QOL among persons with BPH was 102.2 (SD = 12.9). The scoring index was 63.9%, indicating that persons with BPH in Wenzhou had a moderate level of QOL. This finding is consistent with studies by Daoxiu et al. (2021) and Yang (2017). Yang (2017) reported that the mean score of BPHQOL of Chinese persons was 104.8 (SD = 20.0), and the scoring index was 65.5%. The results of this study can be explained based on SMT, which posits that symptom experience (e.g., frequent, urgent, painful urination), physical and social environmental factors (e.g., residential area, work status), and individual and family factors (e.g., education and economic status) are related to QOL (Silva, Lopes, & Merces, 2021).

This research found that the lowest score index of QOL was the disease dimension (56.5%). This may be explained by the fact that one-third of the participants had nocturia ≥4 times per night, and 46% were in stage 3 of BPH. Thus, this group may face long-term urinary incontinence, frequency of urination, and other LUTS. Unfavorable treatment prognosis may have a deleterious impact on QOL in those cases (Yanqin & Yanqi, 2014). These findings are consistent with those of Oelke, Adler, Marschall-Kehrel, Herrmann, & Berges, (2014) which found that the more times of nocturia, the lower the QOL of patients. Frequent nocturia will increase the risk of falls and even fractures in the elderly, as well as sleep disturbance, chronic fatigue, and other adverse consequences. Thus, nocturia is one of the risk factors leading to the decline of QOL in the elderly patients with BPH (Oelke, Weiss, et al., 2014).

Moreover, this research found that the highest score index of QOL was physiological dimension (88.8%). This can be explained by the fact that more than half of the participants were age less than 70 years, (21% were 50-59 and 36% were 60-69 years). Moreover, 44% of the participants had been living with BPH for three years and are in relatively good physical condition. In addition, the psychological dimension may be an important factor leading to QOL. In this survey, the score index of the psychological dimension of middle-aged and elderly BPH patients was 61.5%, which is at a moderate level. This could be explained by the fact that 85% of the participants were living with their spouse, and 12% were living with children. Having a spouse and other family members to provide emotional support is conducive to the improvement of self-care ability, which is basically consistent with other relevant research (Jianchun et al., 2014).

The score of social dimensions of QOL in this research is 70.5%, which is at a high level. Fully 85% of the participants lived with their spouse, and all had medical insurance. About three-fourths (73%) of the participants had a family income of more than ¥8,000. That said, BPH causes frequent and urgent urination, and that can disrupt social activities outside the home. The satisfaction of social interaction needs can greatly enhance the sense of self-esteem of the elderly, moderate the negative emotions caused by disease, and improve QOL generally (Meng et al., 2014).

Factors related to QOL among persons with BPH

This study found that sleep disturbance and QOL were negatively associated in BPH populations. That is consistent with the hypothesis of this study. In this study, 56% of participants reported insomnia. The participants in this study had a moderate level of sleep disturbance, with a mean score for sleep disturbance of 60.8 (SD = 11.0). This could be one reason why the participants' QOL was moderate. That finding is consistent with the studies of Zhang et al. (2021) and Fan (2022) who found that BPH persons had moderate sleep disturbance, and that affected their QOL. This result is consistent with many studies which found that sleep disturbance was negatively associated with QOL (Baek et al., 2020). The findings suggest that a higher level of sleep disturbance was associated with lower level of QOL. BPH sleep disturbance is mostly manifested as chronic insomnia and sleep disruption. Those are directly related to the increase of nighttime urination and decreased daytime energy, which also leads to the reduction of QOL (Yanli, Juan, & Lu, 2017).

Severity of LUTS in patients with BPH seriously affects the QOL of the persons with BPH. Severity of LUTS and QOL were negatively associated in BPH populations ($r = -.636$, $p < .001$). That is consistent with the hypothesis of this study. According to SMT, severity of LUTS was a symptom that is acutely perceived by BPH persons. This study found that higher the severity of LUTS, the worse the QOL. In this study, participants had moderate symptoms of LUTS (M = 19.3, SD = 5.0). Just under half (48%) of the participants had moderate LUTS (M = 15.5, SD = 2.2), and half had severe LUTS (M = 23.6, SD = 2.3). Similarly, 48% of participants in the survey reported three episodes of nocturia and 33% reported four or more episodes per night. Frequent nocturia was certain to affect QOL (Michel et al., 2020). Studies have shown that there is a significant negative correlation between IPSS symptom scores and QOL, which is consistent with the study by Choi, Heo, Lee, & Son, (2017). Moreover, the effective management of LUTS can significantly improve the QOL of patients (Michel et al., 2020). In addition, effective symptom management strategies can better improve the health problems of patients and improve their QOL

This study found that depressive symptoms were negatively correlated with QOL among persons with BPH ($r = -.670$, $p < .001$), implying that depression is the main factor affecting the QOL among persons with BPH. In this study, the participants did not indicate signs of clinical depression (M = 5.0, SD=2.9). This may be related to the fact that the participants had higher social support, higher income, and all had health insurance. At the same time, more than half of the participants had been diagnosed with prostatic hyperplasia, which lasted two to three years, which is not that long a time period. Previous research has pointed out that depression can have a great impact on the QOL of Chinese elderly (Bai & Cheng, 2022). Only 20% of participants reported depression in this study. It has been noted in the literature that BPH persons who have depression, the lower the QOL (Pei et al., 2019).

Social support and QOL were positively correlated in BPH populations ($r = .485$, $p < .001$). That finding is consistent with the hypothesis of this study. In the present study, the participants had a moderate level of social support (M = 39.0, SD = 6.3). Social support has an obvious beneficial effect

on patients, and increasing social support can promote QOL (Cao, Qi, Shen, & Han, 2017). Social support can ameliorate a patient's negative emotions and help them achieve a positive psychological state (Dan, 2017). Social support plays an extremely important role in the family and community disease management of patients with BPH. Many studies have shown that the QOL of patients with BPH is affected by social support (Zhiguo, Yanbin, & Can, 2015). High social support can effectively improve the physical, psychological, social and satisfaction of patients, so as to effectively improve the QOL of patients (Cao et al., 2017). Studies have found that the level of social support is one of the main influencing factors of QOL among of BPH patients, that is, the higher the level of social support, the stronger the QOL, this is consistent with SMT (Sujuan, Hua-Lu, & Xiao-Qin, 2015).

Implications of the findings

This study provides helpful information about QOL and its related factors of persons with BPH in Wenzhou, China. This information provides a basis for the development of targeted interventions to reduce depression, sleep disturbances, and LUTS, while increasing social support to promote better QOL among persons with BPH.

Recommendations for future nursing research

The study enrolled participants from only one hospital in Wenzhou. Thus, the findings may not be representative for other patient groups of the entire Wenzhou area of China. To generalize the results to BPH population in Wenzhou, we recommend that this study be replicated in multiple settings. Furthermore, the present study only analyzed correlations. Thus, a cause-effect relationship between LUTS, depression, sleep disturbance, social support and QOL among persons with BPH is inconclusive. Further intervention studies are needed to strengthen the understanding of this relationship and determine the exact methods that can be effective for improving social support, reduce LUTS, minimize sleep disturbances, and reducing depression to improve QOL.

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