Relationship between Benign Prostatic Hyperplasia Patients' Quality of Life and the Severity of Their Lower Urinary Tract Symptoms

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Abstract

Background: Benign prostatic hyperplasia is a common problem that affects men older than 50 years. Benign prostatic hyperplasia can lead to urinary retention, and often the presence of moderate-to-severe lower urinary tract symptoms could impact on patients' quality of life. **Aim:** to assess the relation between the severity of lower urinary tract symptoms and quality of life among patients with benign prostatic hyperplasia. **Research design:** A descriptive correlational research design was utilized. **Setting:** Assiut University Urology Hospital. **Sample:** A targeted sample of sixty male patients with BPH who were experiencing lower urinary tract symptoms. **Tools: tool I:** A structured interview questionnaire, **tool II:** International Prostate Symptom Score, **tool III:** Benign prostatic hyperplasia - Specific Quality of life scale. **Results** showed that the mean age of studied patients was 51.97±4.94 years. 80% presented with grade II, according to severity of lower urinary tract symptoms, 3.30% had mild symptoms, 71.0 % had moderate symptoms, and 25.0% had severe symptoms. There was a statistically significant positive correlation between the severity of lower urinary tract symptoms and quality of life (P. value <0.01) **Conclusion:** The quality of life among patients with benign prostatic hyperplasia decreases with the increment in the severity of their lower urinary tract symptoms. **Recommendation:** Further studies are needed to study factors aggravating the severity of lower urinary symptoms among patients with benign prostatic hyperplasia and target interventions that burden its effect on patients' quality of life.

Keywords: Benign Prostate Hyperplasia, Lower Urinary Tract Symptoms & Quality of life.

Introduction

Benign prostatic hyperplasia (BPH) is a prevalent condition among men aged 50 and older, affecting approximately one-third of this population globally. According to the **(Djavan et al., 2023).**an estimated 30 million men worldwide and 121,232 men in Egypt are living with BPH. This benign enlargement of the prostate gland, marked by increased cell growth, exceeds the normal volume of 20-30 mL and is associated with lower urinary tract symptoms (LUTS) as a consequence of the aging process **(Sandhu et al., 2024).**

LUTS are divided into two main categories: storage symptoms and voiding symptoms. Storage symptoms encompass issues like nocturia, urinary frequency, urgency, decreased urine flow rates, incomplete bladder emptying, and hesitancy. These symptoms arise from two primary factors: bladder outlet obstruction (BOO) caused by an enlarged prostate and increased smooth muscle tone and resistance, and the intricate interconnection among the bladder, bladder neck, prostate, urethra, and central nervous system **(Calogero, et al., 2018).** BPH can result in significant complications, including urinary retention, kidney insufficiency, recurrent urinary tract infections, visible blood in urine, and bladder stones. Treatment options consist of lifestyle changes, behavioral modifications, medication, minimally invasive procedures, and surgery **(Djavan et al., 2023).**

While lower urinary tract symptoms linked to BPH (LUTS/BPH) are generally not life-threatening, they can have a considerable impact on an individual's quality of life. LUTS have effects that extend beyond just the urinary tract. Each patient exhibits varying levels of symptom tolerance, which in turn can heighten the likelihood of encountering challenges in self-care, restrictions in regular activities, as well as feelings of pain, discomfort, anxiety, and depression among men **(Almarkhan et al., 2018).**

Benign prostate hypertrophy (BPH) and lower urinary tract symptoms (LUTS) cause substantial physical and psychological consequences that could seriously interfere with daily activities, including discomfort, restricted travel and outings, affect the QOL and greatly cost the health-care systems due to concerns about urinary function, prostate cancer, embarrassment about urinary problems, and even psychological problems such as tension, anxiety, and mood disorders. Current surgical and

pharmacological therapies are expensive, may not effectively improve prostate function and health but cause adverse effects, Introduction 4 non-pharmacological therapies as tai chi exercise may improve BPH related symptoms and enhance QOL **(De Jonge et al., 2023).**

Significance of study:
The prevalence of BPH rises to more than 50% at 50 years of age. As life expectancy increases, BPH will be a significant cause of morbidity. Individuals with BPH experience heightened distress and disruption in specific daily tasks as a result of urinary symptoms. Managing a diagnosis of BPH and its treatment can lead to significant emotional and psychological effects, potentially affecting social interactions, emotional well-being, and overall contentment for the patient. Existing research suggests a scarcity of studies exploring the link between the severity of lower urinary tract symptoms and the quality of life in individuals with benign prostatic hyperplasia.

Aim of study:
To assess the relationship between the severity of lower urinary tract symptoms and quality of life among patients with benign prostatic hyperplasia.

Research question:
What is the correlation between lower urinary tract symptoms and quality of life in patients with benign prostatic hyperplasia.

Patients and Methods
Research design:
Descriptive correlational research design was used.
Setting:
 This study was carried out in Assiut University Urology Hospital, it is the largest specialized hospital in Upper Egypt for the treatment of urological and genitourinary diseases. where it receives thousands of patients to receive treatment, examinations and conduct many operations from all over the Republic.
 Sample:
A purposive sample of sixty adult male patients were intentionally selected for inclusion in the study based on specific criteria. These criteria included being male adults over 40 years old with a diagnosis of benign prostatic hyperplasia and the absence of other conditions impacting urination, like neurological ailments, UTIs, or prostate cancer. **Exclusions** comprised patients with cognitive impairments or those who declined to take part in the research.
Sample size
In accordance with the findings from the Global report on epidemiology update from 2021, the researcher included 60 male adult patients diagnosed with benign prostatic hyperplasia after determining the necessary sample size using Epi info version 6.

This sample size was calculated to ensure an accurate representation with a confidence level of 95% and a power of 80%. Sample size has been calculated using the following equation: Validity and reliability P 0.07 1-P0.93

$$n = \frac{N \times p(1-p)}{\left[\left[N - 1 \times \left(d^2 \div z^2\right)\right] + p(1-p)\right]}$$

Total number N
Error rate d 0.05
Stander deviation. Z 1.96
At power 80% and CI 90%, the sample size 60 participants.

Tools for data collection
Three tools were used to collect relevant data for this study

Tool (I): A structured interview questionnaire:
It was developed and utilized by researchers to gather the necessary data: it included the following parts:

Part (1): Socio-demographic data: This part included age, level of education, occupation, type of work, and residence.

Part (2): Clinical data:
This part included past, present health history, family health history, and presented signs and symptoms.

Tool (II): International Prostate Symptom Score (IPSS): The IPSS is a scoring system used to screen for and diagnose BPH as well as to monitor lower urinary tract symptoms and guide decisions about how to manage the disease, was developed by American Urological Association, 1992. It includes seven questions about the symptoms of lower urinary tract symptoms that asked the patients about how often they have any of the symptoms. Each question had a range from 0 to 5 for its answer. Maximum score of 35 points. Based on total score, the symptoms were categorized as mild (0 -7), moderate (8-19), and severe (20-35).

Tool (III): Benign prostatic hyperplasia -Specific Quality of life scale:
In 2004, Cam et al. developed a BPH-specific Quality of Life scale comprising 20 questions focusing on the impact of BPH on quality of life. Patients rated each question from 0 to 3: 0 indicating no bother, 1 for little bother, 2 for moderate bother, and 3 for severe bother. The total Quality of Life score was determined by summing the scores from all 20 questions, ranging from 0 to 60. An increase in the quality-of-life score correlates with a deterioration in the overall quality of life.

Content validity and reliability
The study's validity was confirmed through an evaluation of whether the tools effectively measured their intended constructs. In this research, five professors specializing in medical surgical nursing and medicine assessed the tools to guarantee they

comprehensively covered all study aspects to fulfill their objectives. On the other hand, reliability was established to determine the accuracy of the data collected in the research. This was evaluated using Cronbach's alpha test, resulting in values of 0.98 for the benign prostatic hyperplasia-specific quality of life scale and 0.824 for the International Prostate Symptom Score (IPSS).

Pilot study

A pilot study was conducted on 10% of patients (6 patients) to evaluate the clarity, feasibility and applicability of tools. The data obtained from pilot study was analyzed and some changes were made. Patients who participated in the pilot study were excluded from the main study.

Ethical consideration

The research proposal received approval from the Ethical Committee at the Faculty of Nursing, Assiut University. No risks were posed to the study participants during the research process, and the investigator ensured the confidentiality and privacy of the patients under study. The investigator provided a clear overview of the study's objectives and nature to the patients. Patients were informed of their right to decline participation, and their consent to take part in the study was obtained.

Implementation phase

- This study was conducted over a six-month period from September (2022) to March (2023).
- The investigator attended the mentioned setting three days per week from 8 am to 12pm to collect relevant data from the patients studied.
- The investigator greeted patients and introduced self; the purpose of the study was explained to studied patients prior to any data collection.
- Assessment of socio-demographic characteristics of studied patients was done by using tool I (part1)
- Assessment of clinical data was completed by using tool I (part2).
- Assessment of lower urinary tract symptoms was completed by using tool II.
- Assessment of patient's QoL due to BPH was done using tool III.
- After finishing the assessment, the investigator clarified to all patients any wrong or missing information about BPH and how to reduce its complication. Also emphasized the importance of follow up as scheduled.

Statistical analysis:

Before proceeding with additional statistical analyses, the data underwent normality testing using the Anderson-Darling test and assessment for variance homogeneity. Categorical variables were presented using counts and percentages (N, %), while continuous variables were described with means and standard deviations (Mean, SD). The comparison between categorical variables was conducted using the Chi-square test, and for continuous variables, the t-test was employed. A two-tailed p-value of less than 0.05 was deemed statistically significant. Pearson correlation analysis was utilized to determine associations between scores. All statistical analyses were carried out using IBM SPSS 20.0 software.

Results

Tables (1): Distribution of patients according to their socio demographic characteristics (n =60).

Variables	No	%
Age		
Less than 50 yrs.	17	28.30
More than 50 yrs.	43	71.70
Mean ±SD (range)	**51.97±4.94(42-62)**	
Education		
Basic education	2	3.30
Secondary	21	35.00
University education	37	61.70
Occupation		
Working	5	8.30
Not working	55	91.70
Marital status		
Married	60	100.00
Residence		
Rural	11	18.30
Urban	49	81.70
Comorbid conditions (controlled)		
Hypertension (HTN)	17	28.30
Ischemic heart disease (IHD)	5	8.30
Grades of BPH		
Grade I	5	8.30
Grade II	48	80.00
Grade III	**7**	11.70
Duration of LUTS due to BPH		
Less than 1 year	37	61.70
From 1-2 year	23	38.30

Table (2): Mean scores of lower urinary tract symptoms as measured by the International Prostate Symptoms Score (IPSS) (n =60)

Lower urinary tract symptoms (LUTs)	Mean ±SD	
Incomplete emptying	3.1±0.95	
Frequency	3.0±1.41	
Intermittency	2.95±0.96	
Urgency	2.63±0.84	
Weak stream	2.9±1.05	
Straining	2.73±1.04	
Nocturia	2.55±0.98	
Total IPPS score Mean± SD (range)	19.87±5.07 (15-31)	
Severity of LUTS	N	%
Mild (0 -7)	2	3.30
Moderate (8-19)	43	71.70
Severe (20-35)	15	25.00
Quality of Life (QoL) due to urinary symptoms	4.00±0.55	

IPSS: International prostate symptom score

QoL: Quality of life

SD: Standard deviation.

Table (3): Distribution of BPH-specific Quality of life scale (n=60).

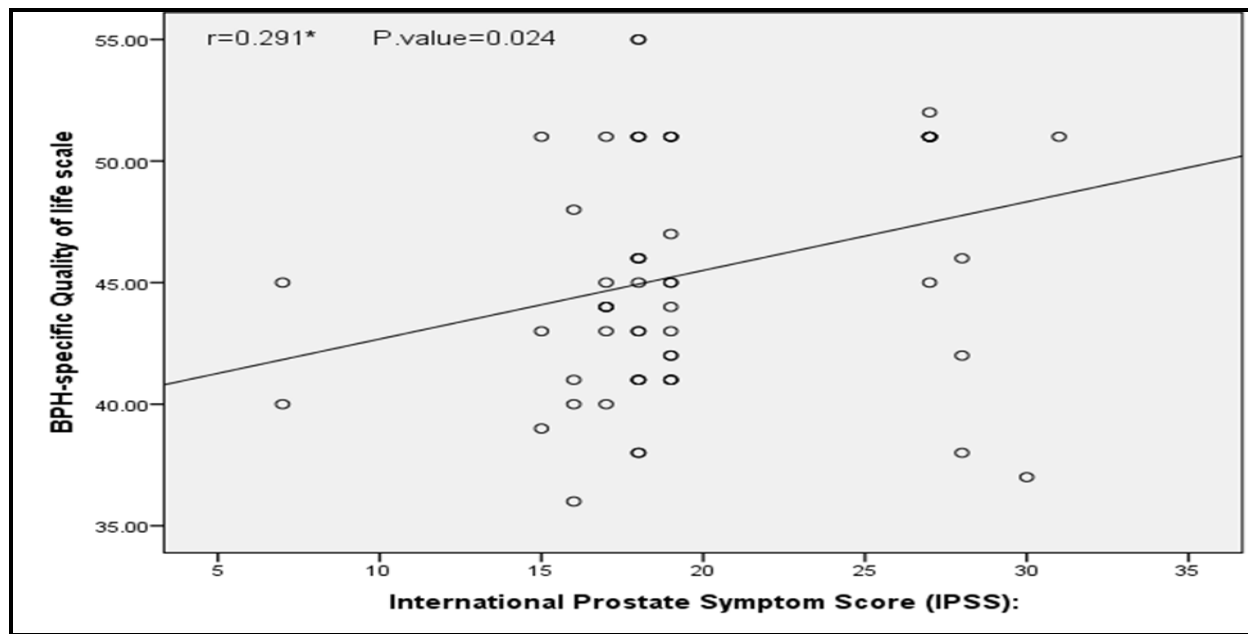| BPH-specific Quality of life scale	No	%
Mild (0-20)	0	0.0
Moderate (20-40)	9	15.0
Severe (40-60)	51	85.0
Mean±SD(range)	**45.46±4.92(36-55)**	

Figure (1): Correlation between severity of lower urinary symptoms and quality of life among patients with Benign prostatic hyperplasia (n =60)

Table (1): Shows that; and the 71. 70 % of them were aged above 50 years. Concerning marital status and education; all of them were educated and married. Also, the table revealed (81.7%) were from urban areas. one-third (28.3%) of patients had hypertension. According to the degree of BPH, it showed that most of the patients (80%) presented with grade II, more than half (61.7%) had symptomatic BPH for one year, and 38.3% had symptomatic BPH for two years.

Table (2): Reflects that, most patients had incomplete emptying, frequency, intermittency, and urgency. Most patients had moderate lower urinary tract symptoms (71%), other patients had severe symptoms (25%), and the least percentage of mild symptoms (3.30%).

Table (3): Illustrates that most patients (85%) had severe adverse impact on their quality of life and (15%) of patients had moderate negative effect on their quality of life (15%).

Figure (1): Shows that there was a positive relationship between International Prostate Symptoms Score and quality of life. This means that as the IPSS increases, the quality-of-life decreases, and vice versa.

Discussion

The current study revealed that the patients had an average age of fifty years. This signifies that the older adult age group was the most common age group. Our findings align with a hospital-based study conducted in Port Harcourt, Nigeria, which reported a prevalence rate of twenty five years **(Drake et al., 2023).**

Regarding the patients' living locations, the current study found that over half of them live in urban areas, while less than a third reside in rural areas. This finding aligns with a study by **Shaun, et al., (2017)** that analyzed thirty-one prevalence rate estimates from twenty-five countries, indicating no notable variation in benign prostatic hyperplasia prevalence based on geographical location. This finding could be connected to a particular area of a hospital in Assiut governorate, where the samples were taken, and which caters to a diverse group of people from various governorates.

Typically, there is a strong agreement between the BPH grade and clinical stage, with high stage II BPH often attributed to detrusor under activity as a potential reason for elevated post-void residual urine.

In our examination of 60 patients with male LUTS/BPH, 48 patients were classified as stage II; 7 of them were at grade 3, while only five were at grade 1. Therefore, there was disagreement with **(Foo, 2017).**

In relation to LUTS, the latest research showed that fewer than one-third experienced urgency, frequency, and intermittency, which contradicts the findings of **Soler et al. (2018)** that reported four percent, three percent, and five percent of participants had urgency, frequency, and intermittency. In our research, trouble linked to symptoms in specific groups like storage (frequency, urgency) and voiding (slow stream, hesitancy) was associated with an increased chance of seeking treatment. This data provides evidence that voiding symptoms are not the sole LUTS of BPH, as patients sought treatment regardless of their LUTS subgroup **(Przydacz et al., 2021).**

The current research demonstrated that more than half of patients experienced severe impacts on their quality of life, while more than twenty percent experienced moderate impacts. These findings are consistent with a study by **Asare (2015)** on prostate shrinkage and improved quality of life for BPH patients, as well as with **Haltbackk's (2015)** research on varying levels of quality-of-life interference in their study sample.

Mark & Guiseppe (2016) discovered that majority of their quality-of-life samples were significantly affected, supporting this conclusion. In contrast, **Abraham et al. (2016)** found that roughly two-thirds of their study participants reported a good quality of life, while about two-fifths indicated a poor quality of life. This aligns with findings from **Ojewola et al. (2017)**, who noted that more than two-thirds of participants experienced a diminished quality of life.

Research has indicated that the physical, mental, and sexual consequences of LUTS can significantly impact the wellbeing of elderly men. The evidence suggests that BPH can impact the urological, sexual, and mental well-being of elderly males. **In his 2018 study, Zhang** investigated the frequency of LUTS in BPH patients and how they affect the sexual function and mental well-being of elderly males, suggesting the need for additional research on the impacts of BPH in older men. Research of this kind will offer improved insights into the necessary treatment and management approaches to enhance the quality of life for older men with BPH.

The recent research showed a strong statistical correlation between LUTS in patients and their quality of life, contradicting **Chan et al. (2023)** who claimed there was no such relationship. It may be related to the influence of LUTS on both overall quality of life and health-related quality of life.

This study found a strong link between LUTS in patients and their quality of life, contradicting **Abraham et al (2016)** claim that there was no such association. The impact of LUTS on quality of life and health-related quality of life is a possible connection.

In my opinion, BPH has a negative impact on the quality of life and in turn affects the IPPS in patients, which is supported by **Jain et al., 2020**. Their study revealed a significant difference in QOL and IPSS with a P value = 0.000.

Conclusion
The study concluded that the quality of life among patients with benign prostatic hyperplasia decreases with the increment in the severity of their lower urinary tract symptoms.

Recommendation
1. At outpatient clinics, a brief overview of benign pr ostatic hyperplasia condition is provided in an easy -to-read Arabic booklet.
2. More research is required to examine the various el ements that contribute
to patients' complaints and increased load to identif y appropriate remedies, larger samples will be used in future research.

References
▪ **Almarkhan, M. H., Sawma, A. I., & Alruwaili, F. S. (2018):** Prevalence of Benign Prostatic Hyperplasia (BPH) in Saudi Patients above 40 Years Old. The Egyptian Journal of Hospital Medicine, Vol.70 No.(7), Pp:1137–1139. https://doi.org/10.12816/0044539

▪ **Caloger, Zumrutbas AE, Yaman O. The relationship between lower urinary tract symptoms (LUTS) (2018):** Diagnostic indicators of benign prostatic hyperplasia (BPH), and erectile dysfunction in patients with moderate to severely symptomatic BPH (2018): Int Urol Nephrol,Vol:51,No:15,Pp:26-32.

▪ **Shaun, Hong GE, Ho C, Nocturia in patients with benign prostatic hyperplasia: (2017):** evaluating the significance of ageing, co-morbid illnesses, lifestyle and medical therapy in treatment outcome in real life practice. Aging Male, Vol: 18, Pp: 112–117.

▪ **Mark, Yeo JK, & Cho DY, (2017):** Impact of metabolic status on the association of serum vitamin D with hypogonadism and lower urinary tract symptoms/benign prostatic hyperplasia. Aging Male,Vol:17,No:5,Pp(20-29)

- **Ojewol, Daltoé L, & Succi G, (2015):** Relation between glycemic levels and low tract urinary symptoms in elderly. Aging Male, Vol:18,No:5,Pp:(34-37)
- **Abraham JM. The effect of androgen supplementation therapy on the prostate (2016):** Aging Male, Vol: 6, Pp: 166–174.
- **Zhang, Holton KF, Parsons JK, and Osteoporotic Fractures in Men (MrOS) Study Group, et al. (2018):** Lifestyle and health factors associated with progressing and remitting trajectories of untreated lower urinary tract symptoms among elderly men. Prostate Cancer Prostatic Dis, Vol: 17, Pp: 265–272.
- **Jain, Leung JC, et al. Depressive symptoms and lifestyle factors as risk factors of lower urinary tract symptoms in Southern Chinese men (2020):** a prospective study. Aging Male, Vol: 13, Pp113–119.
- **Asare, (2015):** benign prostatic hyperplasia, Vol.18 No. (7), Pp: 1258–1296.
- **Chan, A., Chan, S., Estivalet, A., Man Leung, L., Tam, H., Ho, J., Hsu, W., Tang, P., & Yan, E. (2023):** Mitigating Lower Urinary Tract Symptoms Secondary to Benign Prostatic Hyperplasia: Ameliorating Sexual Function and Psychological Well-Being in Older Men. American Journal of Men's Health, Vol.17,No(6),https://doi.org/10.1177/15579883231 205521
- **Drake, M., Worthington, J., Frost, J., Sanderson, E., Cochrane, M., Cotterill, N., Fader, M., McGeagh, L., Hashim, H., MacAulay, M., Rees, J., Robles, L., Taylor, G., Taylor, J., Ridd, M., MacNeill, S., Noble, S., & Lane, J. (2023):** Treatment of lower urinary tract symptoms in men in primary care using a conservative intervention: cluster randomised controlled trial. BMJ. https://doi.org/10.1136/bmj-2023-075219
- **Foo, K. (2017):** Pathophysiology of clinical benign prostatic hyperplasia. In Asian Journal of Urology, Vol. 4, Issue 3, Pp. 152–157, Editorial Office of Asian Journal of Urology. https://doi.org/10.1016/j.ajur.2017.06.003
- **Haltbackk, (2015):** benign prostatic hyperplasia, Vol: 13, No: 5, Pp220-229.
- **Przydacz, M., Dudek, P., Golabek, T., & Chlosta, P. (2021):** Relationship between lower urinary tract symptoms and treatment-related behavior in an eastern european country: Findings from the LUTS POLAND study. International Journal of Environmental Research and Public Health, Vol.18,No,(2), Pp:1–13, https://doi.org/10.3390/ijerph18020785
- **Sandhu, J., Bixler, B., Dahm, P., Goueli, R., Kirkby, E., Stoffel, J., & Wilt, T. (2024):** Management of Lower Urinary Tract Symptoms Attributed to Benign Prostatic Hyperplasia (BPH): AUA Guideline Amendment 2023: The Journal of Urology, Vol.211, No :(1), Pp: 11–19. https://doi.org/10.1097/JU.0000000000003698
- **Soler, R., Gomes, C., Averbeck, M., & Koyama, (2018):** The prevalence of lower urinary tract symptoms (LUTS) in Brazil: Results from the epidemiology of LUTS (Brazil LUTS) study. Neurourology and Urodynamics, Vol: 37, No :(4), Pp: 1356–1364. https://doi.org/10.1002/nau.23446