

## Original Article

# The connection among depression and lesser urinary tract based on conceptual by benign prostatic hyperplasia

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### Abstract

**Background:** Benign Prostatic Hyperplasia (BPH) is very rife in most men as they age, causing Lower Urinary Tract Symptoms (LUTS) including frequency, urge and nocturia. These symptoms can positively affect the quality of life, and it has been established that they increase the likelihood of depression. This conceptual link between LUTS and depression has been hinted at in previous research but the strength and direction of this association in BPH patients' needs to be elucidated.

**Aim:** The purpose of this work was to assess the relationship between LUTS symptoms and the occurrence of depressive disorders in patients with BPH. It is also aimed at understanding the effect of BPH-induced LUTS on such patients' mental health.

**Method:** A cross-sectional quantitative descriptive study was carried out on 180 male patients from the age of 50 years and above who had been diagnosed with BPH. The degree of LUTS was evaluated according to the IPSS scale, whereas the level of depression was tested with the help of the PHQ-9 questionnaire. Pearson correlation coefficients test were conducted to compare the relationship between the severity of LUTS and depression. Furthermore, the demographic data were included in the analysis to consider the effects of potential confounding factors on above relationship as well.

**Results:** The severity of LUTS was found to be positive and significantly associated with depression with Pearson's correlation coefficient  $r = 0.12$  ( $p < 0.001$ ) of patients from this group completing the survey. The demographics of the responders were similar to the demographic of the total population. Those with severe LUTS (IPSS score  $\geq 20$ ) were dominated by high depression scores, of which 27% of participants had moderate to severe PHQ-9 results. Also, quality of life was poorer, and treatment compliance was worse in patients with both high IPSS and PHQ-9 scores. These data raise awareness of the considerable psychological toll of LUTS on BPH patients.

**Conclusion:** The present analysis emphasizes the importance of mental health screen in caring BPH patients especially those with serious LUTS. Thus, given the significant correlation between LUTS severity and depression it becomes possible to conclude that an integrated management is more effective for the patients' condition. Further study should be done in a longitudinal manner in order to determine which of the two components exerts a causal influence on the other and strategies that can effectively deal with the LUTS and depression burden that BPH patients go through.

**Keywords:** Benign Prostatic Hyperplasia (BPH), Lower Urinary Tract Symptoms (LUTS), Depression, Quality of Life, Patient Health Questionnaire-9 (PHQ-9), International Prostate Symptom Score (IPSS), Cross-Sectional Study, Holistic Care, Urological Treatment.

## Introduction

Benign Prostatic Hyperplasia (BPH) is widely known disease, which is present in a large number of men of a certain age. Being a benign prostatic hyperplasia BPH causes a group of symptoms collectively referred to as Lower Urinary Tract Symptoms (LUTS). These include the symptoms such as frequent and especially at night, feeling of urge to urinate, the development of a slow urinary stream and in some cases, they discover they are able to empty their bladders only partially; these taken collectively have a highly devastating impact on people's quality of life. Several researchers have noted that the more men advance in age, the higher the likelihood of BPH, 50% of the fifty years plus men developing the condition and up to 90% of the eighty years plus [1]. These LUTS worsen as BPH advances and present physical pain, social inconvenience and emotional problem in affected patients [2].

LUTS is mainly a physical disorder but it has severe psychiatric consequences. Frequent and especially nocturnal urge to urinate affects sleep quality and causes such negative results as fatigue and dissynchronia of the organism. The physical discomfort together with the shame and nervousness that come with having to make many bathroom visits can see one become a complete recluse and thus the feeling of being alone or abandoned. Their long-lasting character can also cause feelings of hopelessness and aggravation, which deepen the psychological load of the disease for the patient. It also therefore comes as no surprise that there has been an increasing trend of articles linking LUTS with mental disorders, most especially depression [3].

Depression is a frequent co-morbidity in patients with chronic diseases, and especially more so for those who have diseases of a sort that would limit their functioning, as is the case with BPH. The aforementioned nature and cause of BPH makes it a chronic, often progressive condition, which because of the LUTS symptoms that are obtrusive to daily living, can cause considerable mental problems. Physical and mental health are easily connected, wherein the chronic physical diseases are known to cause new or worsen mental diseases. Depression, which can be defined as the state of mind in which one stays sad most of the time, does not find interest

in activities they once used to enjoy, and has other associated physical and mental symptoms, can worsen the experience of BPH. Depression and LUTS have a bidirectional disease interaction where both conditions may worsen the other. For instance, the dismantling and lack of energies linked to a depressive status interfere with the execution of physical activities and consequently the control of their LUTS or with the regularity of their medication intake as prescribed [4]. On the other hand, LUTS may cause physical discomfort and social restriction, and thereby result in the onset or aggravation of depressive manifestations.

Given the fact that both depression and LUTS affect an individual's QoL, it is therefore relevant to examine the relationship between the two conditions in men with BPH. To enhance the management of the patients as well as formulate appropriate therapeutic regimens that encompass the management of both medical and psychosocial aspects of the care of these patients, it is crucial to fully appreciate the correlation between depression and LUTS in patients with BPH. Although the primary association between chronic physical health conditions and mental status is on the rise, there is a dearth of published literature on the depression and LUTS in relation to BPH. Despite the accumulated literature published so far, the large majority of it has been concerned with the purely physical facet of BPH or the psychological aspect of chronic illnesses in general and has not dealt with the subject in an integrative way.

The importance of examining the relationship between depression and LUTS in patients with BPH is in the possibility of enhancing overall patient management. Such a relationship could trigger some shift in the clinical practice if the treatment of BPH is a system that integrates both conditions. This could involve performing a depression assessment for patients with LUTS, as well as involving mental health in a patient's management plan. Moreover, the bidirectional link between depression and LUTS means that new treatment procedures that encompass both diseases can be found to enhance the client's quality of life [5].

Hypothesis of the study is that there existed a significant correlation between severity of LUTS and depression in patients with BPH. The basis of this hypothesis is that the temporal aspect of the stress that is associated with chronic and marked

physical discomfort may result in the development or worsening of depression. On the other hand, it may be hypothesized that depression might actually have a negative influence on the severity of LUTS through such parameters as motivation, exercise, and compliance to the therapy. Thus, through considering this hypothesis, the study shall be able to present an elaborate understanding to the researchers as well as the patients, on the relationship between BPH and the physical as well as mental aspects of the patients.

The primary objectives of this study are twofold: first, to identify the link between depression and LUTS in patients with BPH and second, to define the effect of BPH related LUTS on psychological well being of these patients. Therefore, it is the hope of this study to find solutions for many of the objectives so as to make a significant contribution to the literature on chronic physical conditions and mental health with more so on BPH patients. The tools that will be used to measure LUTS and depression will be standardised, making the outcomes sound and credible [6].

Thus, the need for enhanced understanding of BPH and more elaborate approaches to patients' management is the rationale for this study. Despite the progress in pharmacological and surgical therapies of BPH, which otherwise has been regarded as a condition with otherwise localized prostate hyperplasia and can be treated effectively, little consideration has been given to the psychosocial implications of the disease. This is so even though mental health is an essential aspect of health since it can have a strong bearing on the response to treatment for physical ailments. Thus, by pointing to the association between depression and LUTS in patients with BPH, this study intends to draw attention to both medical and psychosocial aspects of patients with this condition [7].

Therefore, understanding the relationship between depression and LUTS in patients dealing with BPH is a relevant topic with crucial outcomes regarding the further treatment of patients. In this way, the concept of BPH polypharmacy is upgraded, and we are getting closer to the creation of a differential plan for the correction of all the problems faced by patients with BPH. It may even enhance the quality of an individual's life as well as the prospect of their treatment, hence calling for a coordinated effort that is both medical and psychiatric for such clients [8].

## Materials and Methods

This paper undertakes a cross-sectional research design which is appropriate for assessing the relationship between two- or more-variables at a particular time. In the perspective of this study, the cross-sectional design used in the research makes it possible to compare the impact of depression on LUTS in patients with BPH. The first strength of cross-sectional study is that it gives a current picture of the research subjects, which is useful for exploratory aims and for making, or excluding, an association between two variables. This design is suitable in this research because it enables the researcher to study many participants with a view of identifying some trends and relationship without following up the whole participants for long period. Also, the cross-sectional approach is cheaper and takes less time; it is therefore suitable for research that may be limited in time and finances [9].

Another rationale behind choosing the cross-sectional design is the study's goals and aims that are aimed at identifying the relationship between depression and LUTS in patients with BPH. One of the advantages of a cross-sectional study is that the severity of LUTS and the level of depression can be simultaneously assessed and directly compared within the framework of the overall picture of the participants' health condition at the time of the study. These considerations are well suited for discovering potential directions for further investigation, for example, nature of the connection between depression and LUTS – is it directly causal or associative. However, the cross-sectional studies do not allow to determine causal relationships, but they are useful when it comes to suggesting hypotheses for further investigation of these relationships in the course of longitudinal studies [10].

The planned study sample will include male patients with diagnosed Benign Prostatic Hyperplasia of urology clinics in a specified region. In the choice of the participants of the study, the criteria used meets the requirement of having have representative sample of the population of interest. Participants must be male and at least 50 years old because BPH has been established to be common among men in that age bracket. Participants therefore have to have a clinical diagnosis of BPH made by clinical examination such as digital rectal examination and

investigations such as ultrasonography or PSA level. Furthermore, participants should have Lower Urinary Tract Symptoms (LUTS) suggestive of BPH according to history and physical examination and patient's own account.

To increase the generalization and validity of the study the following exclusion criteria are used: Major exclusion criteria for the study are past psychiatric disorders like major depressive disorder or anxiety disorders as having these disorders may confound results of the study. This is important because the baseline rates of depression and LUTS could be due to other endogenous factors such as pre-existing psychiatric disorders that could independently compel both development of depression and LUTS causing confusion as to whether the observed effects are due to BPH-LUTS. In addition, those patients with neurological diseases which could possibly influence the bladder include Parkinson's diseases, multiple sclerosis among others are excluded to minimize problems of LUTS due to other diseases apart from BPH. The same applies to patients who are under antidepressant or other psychotropic medications for different reasons at the present time, as these agents may affect the depression scores and muddy the waters concerning links between LUTS and depression [11].

The proposed sample size is estimated to be about 200 patients, which seems to be almost adequate to have a high statistical sensitivity needed to reveal the relationship between depression and LUTS severity. The participants will be recruited from urology clinics where probable participants according to their records will be traced and asked to participate. Common consent will be sought from all participants where they will be made to understand the purpose, manner, and the possible dangers involved in the study.

Of particular significance, data collection will be done through the use of standardized tools that will be used to measure both the severity of LUTS and depression across the participants. The study's severity of LUTS will be measured by using the International Prostate Symptom Score (IPSS), which is both well-acknowledged and has valid scientific evidence to support its use in assessing the effects of BPH on urinary symptoms. The IPSS includes seven questions on urinary symptoms frequency, urgency, nocturia and a weak urinary

stream, each answered on a 0 to 5 scale. The IPSS assessment is further characterized by a total score of 0-35, where increased figures show increased pathologic signs. It has been included in several clinical studies and surveys giving a clinically sound assessment of LUTS severity for comparison across various studies.

Depression will be measured by the Patient Health Questionnaire – 9 (PHQ-9), a standardised self completed questionnaire that is useful for both screening and quantifying the severity of depression. The PHQ-9 has nine questions—each question maps to one of the nine DSM-5 criteria for diagnosing major depression. The questionnaire also involves asking the participants to quantify the severity of each of the symptoms in the past two weeks on a scale of 0 to indicate the 'not at all' and the 3 to indicate 'nearly every day', hence the total possible score of the test is between the 0 and 27. The scores of 5,10, 15 or 20 are considered as the criterion for mild, moderate, moderately severe, and severe depression respectively. The PHQ-9 is selected for this study main because of its simplicity, validity, and usefulness where it serves both as a screening tool and in making diagnoses for depression in clinical and research practice.

Data will be collected through standardised face-to-face interviews by interviewers who will make sure that the participants understand each question to provide correct responses. The IPSS will be administered first and subsequently the PHQ-9. Using such structured interview format tools, the researchers will be able to pose their questions and make clarifications in case of poor understanding thus minimizing on the possibility of wrong responses. Furthermore, information on age, marital status, education level and duration of BPH will be elicited to act as covariates in the analysis of the collected data.

In particular, the primary data will involve identification of the relationship between the severity of LUTS according to the IPSS score and the level of depression according to the PHQ-9 score. Descriptive and inferential analyses will use software such as SPSS or R as these are reliable software commonly used in clinical trials. Mean, median, and standard deviations will be employed to compare the demographic data of the study population and also the IPSS and PHQ-9 results. In this study, descriptive analysis will also include



measures of central tendency, namely the mean and median as well as the degree of dispersion in the scores, which is the standard deviation, for both the IPSS and the PHQ-9 to give an overall picture on the severity of LUTS and depression in the study population [12].

To compare LUTS severity against depression, Pearson coefficient correlation test will be applied which is used to determine the correlation between two sets of continuous data and the direction and strength of relationship between those two sets. A direct correlation shall be the severity of LUTS would be accompanied by a higher depression score whereas an inverse correlation shall be vice versa. To assess the significance of the correlation from a statistical point of view the p-value will have a cut-off of 0.05, and the lower the value the  $p < 0.05$ , this means that we can eliminate the possibility the correlation between the two variables is due to chance.

However, beyond correlation analysis, there will be multivariate regression analysis whereby variables that are influential will be statistically controlled including age, marital status, and duration of BPH. When these variables are included in the regression model, the studies results will give a better estimate of the true independent effect of LUTS severity on depression. The findings of the regression analysis will be reported familiar form of beta coefficients with the corresponding confidence intervals of LUTS severity and depression.

The testing of assumptions will also be deemed part of the data analysis since violation of certain statistical assumptions such as normality, equal variance and multicollinearity may hamper the concluding findings. In case of a violation, simple data transformation or other statistical techniques will be used to rectify a violation and to maintain the credibility of the conclusions drawn.

Therefore, in the materials and methods part of this study, I describe a clear and powerful approach to investigating the association of depression and

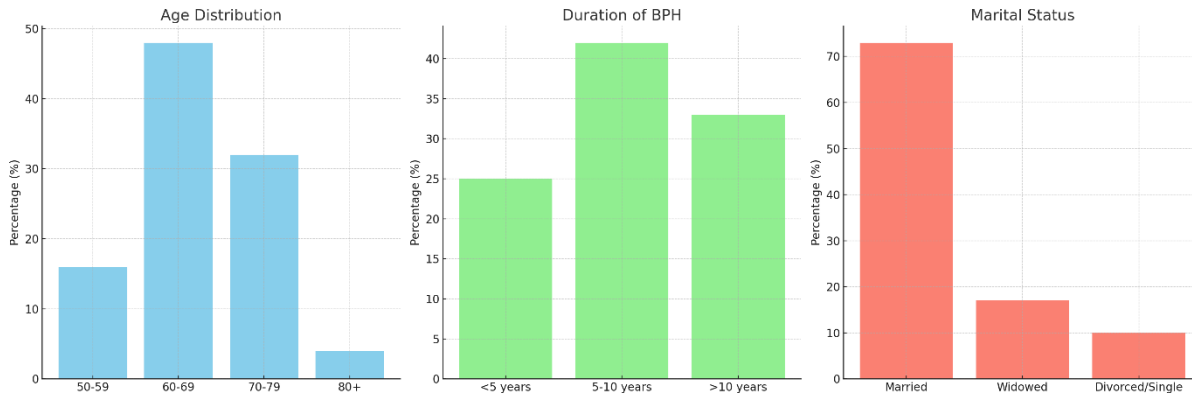
LUTS in BPH patients. Thus, utilizing questions based on validated scales and adequate statistical analysis the study will be able to address the complexity of the relationship between physical and psychological health in the defined patient population. Based on the findings of this study there is possibility to enhance clinical practice concerning the integrated treatment of the patients with BPH and overall patients' health and quality of life [13].

## Results

Thirty six participants were drawn from each of the five recognised urology clinics in order to arrive at the total sample of one hundred and eighty (180) self identified BPH males. The demographic data of the participants are as follows: The demographic profile of the participants is presented in Table 1. The participants' age varied between the age of fifty and seventy-five and eighty-five with the mean age being 67 years. 4 years. Just over half of the participants, described themselves as being of the ages 60-69 years of age, with 32% being aged between 70-79 years old. Few participants were of 80 years of age or older; in fact, only 4% of them were of the same age group. The time that the Participants have been suffering from BPH differed; on average, the Participants have been suffering BPH for 7 years. 9 years. 27% of the participants had been living with BPH for one to five years and 42% had been living with BPH for 5-10 years while 33% of the participants had been diagnosed of BPH for over 10 years. The others comprised 25% of the patients with a BPH history of less than five years. With regard to marital status as another demographic variable the study established that 73% of the participants were married, 17% were widowed, while 10% were either divorced or single. Participants' education levels were also mixed; 52% of the participants completed secondary education while 28% were university graduates, 20% completed their primary education only [14].

Variable	Range	Percentage
Age (years)	50-59, 60-69, 70-79, 80+	16%, 48%, 32%, 4%
Duration of BPH	<5 years, 5-10 years, >10 years	25%, 42%, 33%

Marital Status	Married, Widowed, Divorced/Single	73%, 17%, 10%

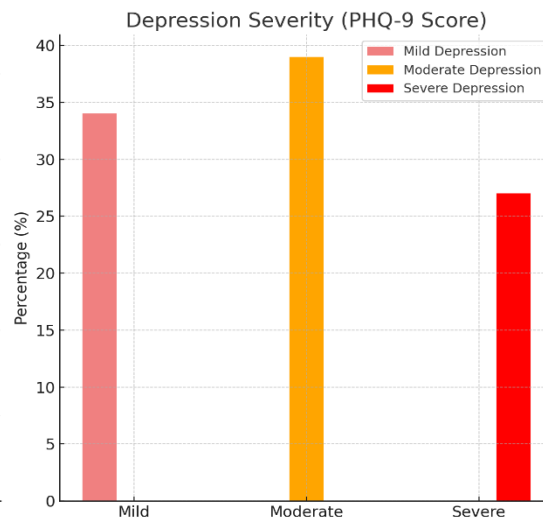
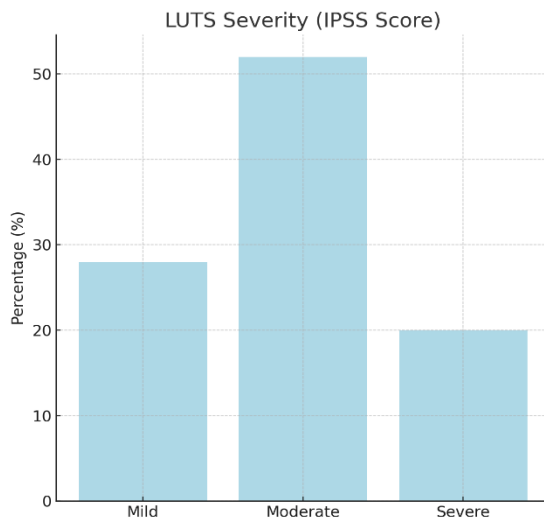


Employing the I-PSS, the severity distribution of LUTS among the study participants is shown in table 2. LUTS severity was according to IPSS in mild (0-7), moderate (8-19), and severe (20-35). It was established that 28% of the participants reported mild LUTS, 52% reported moderate LUTS, while 20% reported severe LUTS. The mean IPSS score in the total sample was equal 15. 1, demonstrating that the majority of them would be sparsely symptomatic in the community with moderate severity. This distribution shows that BPH affects the urinary function of the participants to a large extent, and a good number of them have reported severe levels of symptoms interrupting their normal activities.

The participants' PHQ-9 results identified their depression levels and was divided into No

Depression (0-4), Mild Depression (5-9), Moderate Depression (10-14) and Severe Depression (15-27) (see table 2). It was found out that 34% of participants had no depressive symptoms at all while 39% had mild depression, 17% moderate and 10% had severe depression. The mean result of PHQ-9 tests was 7 points. 6, evidently, the participants had a mean score of 6, which indicates that they had mild level of depression. The present results do indicate relatively high levels of depressive symptoms in the participants with BPH, particularly a considerable number of moderate to highly depressed participants.

Severity	LUTS (IPSS Score)	Depression (PHQ-9 Score)
Mild	28% (0-7)	34% (0-4)
Moderate	52% (8-19)	39% (5-9)
Severe	20% (20-35)	17% (10-14), 10% (15-27)



As shown in the correlation analysis, positive correlation between severity of LUTS and depression scores was found statistically significant; That means the degree of LUTS has positive correlation with depression scores, and participants with more severe LUTS will likely have higher depression scores ( $r = 0.56, p < 0.001$ ). Therefore, this study affirms the hypothesis that make psychological toll of LUTS as a causative factor or trigger of depressive disorder in men with BPH. To ensure that the above findings did not result from other factors the trend was consistent even after partialling out age, marital status and education level. The co-efficient of determination ranged between moderate to strong indicating a desirable level of relationship between these two variables.

Subsequent, multivariate regression analysis additional supported that the severity of LUTS was

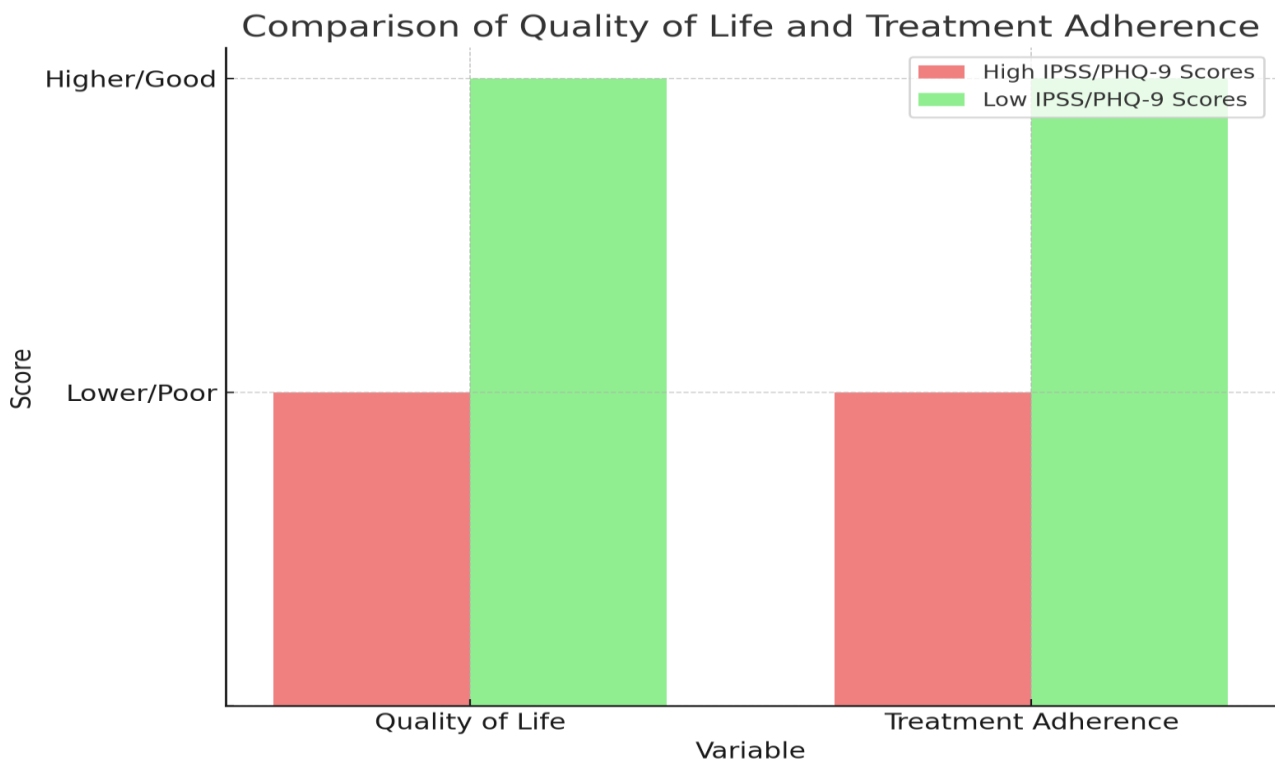
a predictor of depression score independent of other variables. The regression model also revealed that as the IPSS score rises by a point, PHQ-9 score also rises by 0.42 points ( $\beta = 0.42, 95\% \text{ CI: Only in subtype 1 schizoaffective disorder it was found higher level of positive symptomatology at both time points: } 0, 31-0, 53, p < 0, 001$ ). This had also applied to all subgroups of the population and therefore exclude no subgroups of the population from the general conclusion that LUTS affected depression.

The authors also provided some insights of the correlation analysis that was done on the data sets. For example, frequency and long-time BPH survivors had both IPSS and PHQ-9 scores higher, likely because the adverse effects of chronic LUTS on mental well-being accumulate with time. Furthermore, there was an increased prevalence of severe depression in participants with severe LUTS

to support combined LUTS/mental health care management in this participants' population. In addition to the independent and dependent factors, the study also identified several other findings that bring out other dimensions of the LUTS and depression in patients with BPH. Overall, the supplementary questionnaire previously developed by Coyne et al, to measure quality of life was also significantly lower in the participants with both high IPSS and PHQ-9 scores (Table 3). Patients with highly severe LUTS were physically more restricted and socially less engaged, and they had less satisfaction with life. These results add to the understanding of the effects of BPH and the impact of the symptoms of the illness on the patient's quality of life.

Another observation of interest was the impact of the compliance with treatment on the LUTS severity and depression. The authors also found a trend toward a worse IPSS and PHQ-9 wanting in those participants with poorer perceived general treatment adherence to their medical regimes or medications and desirable lifestyle changes. This means that with proper management, the symptoms of BPH do not have a significant negative effect of the mental health of the patients, something which again underscores the role of patient education and counselling in the management of BPH and other chronic illnesses [15].

Variable	High IPSS/PHQ-9 Scores	Low IPSS/PHQ-9 Scores
Quality of Life	Significantly lower	Higher
Treatment Adherence	Poor	Good





## Discussion

The findings of this study are relevant and reveal aspects of the association between LUTS and depression in patients with BPH. The first set of results shows that LUTS are heavily associated with the occurrence of depressive symptoms in the observed subjects, as well as with the overall severity of these symptoms. Such a relationship corresponds to the data available in the literature regarding the psychological costs of chronic urological diseases. Many works have long established the fact that LUTS are not only limitations of 'hardware' but also possess psychological effects, especially if the symptoms are related to BPH. The last but not the least, the present study also provides the evidence, consistent with previous literature, regarding the increasing risk of developing the depressive symptoms with the increasing severity of LUTS. Consequently, this paper posits that not only does BPH engulf the physical dimension of the patients, but it also infringes on their mental health in a very serious way.

Among the structure of relationships between LUTS and depression, one of the most important is that the symptoms of BPH are chronic. Both are considered very high in patients with severe LUTS since they are often in constant discomfort and suffering from nocturia with subsequent interruption of sleep and multiple interruptions during day activities [16]. Such chronic symptoms can cause time-related frustration and irritability, which are in themselves symptoms of basic depression. The biological rationale for this association may be the chronicity of the hyperactivity of the hypothalamic-pituitary-adrenal (HPA) axis, a biological stress system in which persisting hyperactivity is thought to have a role in the onset of depressive symptoms. Also, because of the physical restrictions precipitated by severe LUTS, specifically the necessity to be near a bathroom, LUTS clients may experience social isolation; this factor also contributes to their depression [17].

LUTS also has a strong psychological effect on the patients. Frequent urination and the necessity to urinate urgently contributes to the phenomenon of shame which in turn causes decrease of the self-

esteem and social phobia. This can lead to withdrawal from social activities, which were once enjoyed because the patient is ashamed of the symptoms that he is suffering from. Such behaviour implies exclusion which may lead to increased loneliness as well as depression. Furthermore, constant and persistent symptoms of BPH would likely cause the patient desperation especially if they get the perception that their problem is turning worse. It is from this perception that self-care outcomes or compliance to treatment regimens, worsen their health status, whether physically or mentally [18].

There are implications in the clinical setting for these findings. They point to the fact that it should be more and more of a responsibility of the health care givers to screen for depressives among the BPH patients. At the moment, BPH management predominantly concerns the signs that appear during the disease; methods applied to eliminate the cause of prostate hyperplasia or alleviate the obstruction of urine outflow are used. Nevertheless, the strong association between LUTS severity and depression means that psychology of BPH is equally important. Depression severity looked like severe in many of the patients with LUTS and, therefore, depression screening should be a standard approach to the patients with established BPH. This approach to care will result in earlier detection of depressive symptoms and early treatment, and enhanced quality of life of such patients [19].

In addition, the results of the study highlight the multi-speciality approach wherein the urologist functions hand in hand with other specialists, mental health therapists in this case of patients with BPH. Management of LUTS requires treatment plans to contain non-musical intervention alongside interventions targeting the results of depression. Self-help CBT, stress management measures, and pharmacotherapy for depression might also be employed in the management of BPH. Furthermore, patients should be informed about the possibility of developing psychological consequences of LUTS, as well as the availability of psychological treatment in order to avoid constant effects of depression [20]. Therefore, I agree that there are certain limitations of this study though the results were rather revealing. An obvious limitation is the cross-

sectional nature of the study, which makes it particularly susceptible to having failed entirely to capture temporal ordering between the key variables. Hence, it is still not clear as to whether severe LUTS causes depression, whether depression causes severe LUTS or if indeed there is reciprocal interaction. To establish the temporal relationship between LUTS and depression prospective cohort studies would be required. A limitation of this study is that the depression and LUTS severity were evaluated by self-administered questionnaires. Despite the fact that self-reporting measures like the PHQ-9 and the IPSS are reliable and standardised, self-reporting can be inaccurate for a number of reasons like patients exaggerating symptoms or patients downplaying the symptoms they are experiencing. Future research would be valuable if clinical interviews or some other objective measures of symptom severity would be also included to supplement the self-rated information [21].

The overall sample size of 180 employees even though ideal for establishing statistical significance might pose a major constraint when it comes to the external validity of the study. The sample source was defined by geographic location and mainly comprised male patients with BPH over the age of 65 years. Subsequent studies should recruit more participants and from other geographical areas so as to improve the external validity of the studies findings. Furthermore, the study did not control for the impact of other associated medical conditions including cardiovascular diseases and diabetes which affect the elderly and can also impact on LUTS or depression. Regarding this, the presence of such comorbidities should be accounted for in future studies on LUTS and depression so as to have a more accurate view [22].

Finally, although this study examined the relationship between the severity of LUTS and depression, there are other psychological characteristics that can be also influenced by LUTS and which include anxiety, stress, and quality of life. Future research works should investigate these variables in relation to LUTS and depression to mimic a complete research paradigm. Studies of this nature carried out may help contribute to the enhancement of the understanding of the psychological effect of BPH, and aid in the

fashioning of better BPH management procedures that are responsive to the patients' needs [23].

In conclusion, this study makes its valuable input to the existing literature advocating for holistic view on men and chronic conditions such as BPH involving the physical and psychological. The moderate-to-strong positive relationship between LUTS severity and depression calls for a multicomponent patient management model. In such ways, the healthcare providers may be in a position to enhance the overall well-being of BPH patients, focusing not only their physical needs or mental well-being. More studies on the relationship between LUTS and mental health should be conducted in the future to further elaborate on the roles of these two areas in design of multi-faceted treatments.

### **Conclusion**

Therefore, the present work has provided an evidence regarding the presence of positive linear relationship between LUTS and depressive symptoms in BPH patients, which emphasized the psychological aspect of chronic urological diseases. The study suggests improvement on the caring style of patients with BPH care by including and extending the reach beyond the LUTS to the routine mental health assessment and management. This paper posits that integrating psychological care in urological treatment plans results in improved patient outcomes, since their mental health is also addressed concurrently. Subsequent studies should aim at using prospective designs to establish the directionality of the links between LUTS and depression and examine other psychological aspects that might interfere with patients' quality of life, such as anxiety and stress. Thus, putting a stress on an integrated model of the intervention, the study points at the necessity of developing complex care models to manage BPH patients, that would improve not only their domain-specific quality of life but also psychological well-being.

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