Original paper

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Association between Significant Depressive Symptoms and Prostatic Symptoms among Patients with Benign Prostatic Hyperplasia

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Abstract - Background: Depression among the elderly presents with an increased risk of morbidity, impaired physical, cognitive and social functioning, with a negative influence on the prognosis of other chronic diseases. The study was aimed at examining the burden of depression and its relationship with prostatic symptoms among patients with benign prostatic hyperplasia (BPH). Methods: Participants were evaluated with the Geriatric Depression Scale (GDS) and the International Prostate Symptom Score (IPSS). Association between depression and socio-demographic variables was assessed using multiple logistic regression, and between GDS scores, IPSS, and the duration of lower urinary tract symptoms (LUTS) using Spearman's correlation. Results: Of the population studied, 41.1% had significant depressive symptoms. Participants aged 65years and above AOR=1.78, (95% CI=0.61-5.16), secondary education and below AOR =3.63, (95% CI= 1.37- 9.63), p= 0.01, Unemployed AOR=1.99, (95% CI=0.77-5.13), or had Comorbid illness AOR=2.28, (95% CI=0.97-5.34), p= 0.06 were more likely to be depressed. There was positive correlation between GDS scores and IPSS scores (r=0.385, p=0.001), duration of LUTs (r=0.238, p=0.009) and quality of life (QoL) (r=0.227, p=0.013), and between IPSS scores and (QoL) (r=0.348, p=0.001). Conclusion: A higher proportion of participants had significant depressive symptoms, the risk of which is increased by both clinical and socio-demographic variables.

Keywords: depression; prostatic symptoms; benign prostatic hyperplasia; lower urinary tract symptoms; Nigeria

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Introduction

Benign prostatic hyperplasia (BPH) is a common urological condition manifesting with lower urinary tract symptoms (LUTS) [1]. Lower urinary tract symptoms due to BPH, however, is a growing health problem among men aged 40 and above, with an estimated prevalence of 12 to 50% in men over 40 years [2-4]. The burden of BPH increases with increasing age, with nearly half of all men suffering from BPH-related symptoms later in life. It is the most common neoplasm in men and a common cause of urinary symptoms in adult males [3-5]. With increasing age, enlargement of the prostate occurs, leading to bladder outlet obstruction. This manifests with lower urinary tract symptoms, including frequency, incomplete urination, urgency, leaking or dribbling, and nocturia [6]. These often adversely

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affect sexual functioning and the overall quality of life (QoL) of the bearer [4,7-9].

Among men with BPH, studies have reported a positive correlation between symptoms of BPH and disease-specific measures of QoL [1,4,8,9]. As the population ages, the prevalence of LUTS due to BPH increases, with an increasing burden on society and the healthcare system [1,10]. Besides the burdensome urinary symptoms, men with LUTS also suffer adverse psychological consequences such as depression. The illness also impacts negatively on the QoL of patients and their partners [1,7].

Depression is common among the elderly. The presence of chronic illnesses such as diabetes, cancer, cardiovascular disorder, and BPH increases the risk and the burden of depression [11-13]. The prevalence of depression among the elderly varies, from about 23 to 70% [14-18]. The impact of other chronic diseases affecting their functioning may have exaggerated the burden of depression among this population [11-13]. Depression among the elderly presents with devastating consequences, with increased risk of morbidity, decreased physical, cognitive, and social functioning, and also influences the prognosis of other chronic diseases negatively [14,16-21].

Among people with BPH on the other hand, the risk of depression increases with increasing LUTS severity [22-24], presence of erectile dysfunction [24-26], nocturia, BPH pharmacotherapy [24], sedentary lifestyle, and comorbidities including obesity [5,24]. However, other studies have reported no substantial increase in the risk of depression with the usage of 5-alpha reductase inhibitors [25,26].

Most studies from the non-African studies have shown a positive association between BPH and depression, more importantly with the severity of LUTS and the duration of symptoms. Despite the effect of depression on the course of illness, and, an important factor in determining the QoL, there are limited studies in Nigeria and other African nations looking at the burden of depression among patients with LUTS due to BPH. We aimed at determining the rate of significant depression, and its association with prostatic symptoms among patients with the diagnosis of BPH at a Urological clinic in Nigeria.

Subjects and Methods

Study design and setting

This was a cross-sectional survey of patients with BPH attending the Urology clinic of the Ekiti State University Teaching Hospital (EKSUTH) in Ado-Ekiti, Nigeria. The EKSUTH was set up in 2008 to support the Ekiti State University Medical school. It also provides tertiary Medicare for the people of the state and the neighboring states.

Participants and sampling

Participants were patients with BPH attending the Urology clinic of Ekiti State University Teaching Hospital in Ado-Ekiti. Because of the limited number of participants, non-random sampling was adopted, where consecutive patients that met the inclusion criteria (diagnosis of BPH) were recruited for the study over a twelve-month period.

Exclusion Criteria**:** Patients with prostate cancer, urethral stricture due to other causes, renal failure, overactive bladder dysfunction or treatment for psychiatric or neurological conditions were excluded from the study.

Measures

A socio-demographic questionnaire detailing information such as age, marital status, educational status, employment, duration of diagnosis, and treatment modalities of the subjects was used to assess socio-demographic variables. The severity of BPH symptoms was assessed using the International Prostate Symptom Score (IPSS), and depressive symptoms were assessed using the shorter form of Geriatric Depression Scale (GDS).

The 15-Geriatric Depression Scale (GDS) is a self-report measure of depression in older adults. It was originally developed as a 30-item. This shorter form was chosen because of its high correlation with depressive symptoms in previous validation studies [27,28]. Ten of the 15 items indicate the presence of depression, and the other five were indicative of depression when answered in the positive and negative direction respectively. The 15-item version can be

completed in approximately 5 to 7 minutes, making it ideal for people with limited energy and the ability to concentrate for longer period. The discriminant validity of the GDS-15 was high for non-elderly and elderly subjects. At a cut-off of 4 or 5, it has 85% sensitivity and 84% specificity in non-elderly and 90% sensitivity, and 90% specificity in the elderly [29]. Its classification accuracy did not differ between age groups suggesting its appropriateness as a depression screening instrument in patients with BPH of all ages (27,29,30). In this study, a score of 5 and above was said to be indicative of significant depression.

The IPSS, originally known as the American Urological Association symptom index for benign prostatic hyperplasia was used to assess LUTS [31]. It is a 7-item instrument scored from 0 to 5. The overall score ranges from 0 to 35, with higher scores indicating more severe symptoms [31]. To categorize patients' symptoms and assist physicians to manage treatment, the overall scores were grouped into mild (1-7), moderate (8-19), and severe (20-35). In addition to the 7 items that measure the severity of symptoms, it has an item that assesses the quality of life (QoL). The IPSS has a high internal consistent (Cronbach's $\alpha = 0.86$) with excellent test-retest reliability ($r = 0.92$). Scores have a high correlation with patients' global ratings of the severity of their urinary problem ($r = 0.65$ to 0.72). Quality of life due to urinary symptoms was assessed based on the 1-item question accompanying IPPS and was rated on a 7-points Likert scale with 0 representing Delighted, 1= Pleased Mostly, 2=Satisfied, 3=Mixed Mostly, 4=Dissatisfied, 5=Unhappy, 6= Terrible. Higher scores represent a poor QoL.

Ethical consideration

Written informed consent was sought and obtained from all the patients who participated in the study. The Research and Ethics Committee of the EKSUTH, Ado-Ekiti approved the research protocol. Confidentiality was ensured at every stage of the study.

Data Analyses

Data were analyzed using a statistical package for social sciences (SPSS) version 25 (IBM Inc.). Descriptive statistics were performed as deemed appropriate. Multiple logistic regression was used to explore the relationship between participants' characteristics and the presence of significant depressive symptoms. Relationships between GDS, IPSS, QoL, and duration of symptoms were examined using Spearman's correlation analysis. The level of significance was set at 0.05.

Results

General measures

Forty-nine (41.5%) of the participants present with significant depressive symptoms, with most presenting with moderate to severe form. Their mean GDS score was 4.47 (standard deviation (SD = 3.35), and the mean age was 68.75 yrs (SD = 10.11). The majority of the participants were married 95 (80.5%), with tertiary education 46 (39.0%), and still engage in one job or the other. Most of the participants either reported mixed feelings (36.4%) or mostly dissatisfied (27.1%) with their sexual life. Other general characteristics were as presented in Table 1.

Factors associated with significant depressive symptoms

Table 2 shows factors associated with significant depressive symptoms. Participants who were aged 65years and above [adjusted odds ratio (AOR) = 1.78, (95% CI = 0.61-5.16)], with secondary school and below [AOR = 3.63, (95% CI = 1.37- 9.63), p = 0.01], Unemployed [AOR = 1.99, (95% CI = 0.77- 5.13)], or had Comorbid illness [AOR = 2.28, (95% CI = 0.97- 5.34), p = 0.06] were at greater risk of depression compared with their counterparts.

IPSS severity and depression

Table 3 shows the relationship between IPSS severity and significant depressive symptoms. As the severity of LUTS symptoms increases, the proportion of participants with significant depressive symptoms increases, and this was statistically significant (p = 0.017).

Correlations between GDS scores, IPSS, duration LUTS, and Quality of life

Table 4 shows correlations between GDS scores, IPSS, duration of LUTS (DL) and quality of life scores. There was a positive correlation between GDS scores and IPSS score (r = 0.385, p = 0.001), DL (r = 0.238, p = 0.009),

Table 1. Participants' socio-demographic and clinical variables

Variables	Frequencies	Percent %
Employment status		
Employed	66	55.9
Unemployed	52	44.1
Level of Education		
None	18	15.3
Primary	31	26.2
Secondary	23	19.5
Tertiary	46	39.0
Marital Status		
Without spouse	23	19.5
Married	95	80.5
Employment status		
Employment	66	55.9
Unemployed	52	44.1
Co-morbid medical conditions		
Yes	61	51.7
No	57	48.3
Participants' levels of sexual satisfaction		
Mostly satisfied	23	19.5
Mixed	43	36.5
Mostly dissatisfied	32	27.1
Unhappy	7	5.9
Severity of depressive symptoms		
Mild	19	16.1
Moderate	55	46.6
Severe	44	37.3

and QoL ($r = 0.227$, $p = 0.013$), and between IPSS scores and QoL ($r = 0.348$, $p = 0.001$)

Relationship between treatment choice and depression

Figure 1 shows the relationship between treatment choice and depression. Compared with other groups, a higher proportion of those on management with the catheter only was experiencing significant depressive symptoms. None of those managed with surgery was experiencing depression.

Relationship between sexual functioning and depression

Table 2. Factors associated with significant depressive symptoms

Variables	Significant depressive symptoms		Logistic Regression	
	Absent n (%)	Present n (%)	AOR (95% CI)	p-value
Age group				
65 and above	44 (56.4)	34 (43.6)	1.78 (0.61-5.16)	0.288
<65	25 (62.5)	15 (37.5)		
Level of Education				
Secondary and below	3 5 (48.6)	37 (51.4)	3.63 (1.37-9.63)	0.010
Tertiary	34 (73.9)	12 (26.1)		
Marital status				
Without spouse	21 (91.3)	2 (8.7)	0.06 (0.01-0.30)	0.001
Married	48 (50.5)	47 (49.5)		
Religion				
Christianity	65 (61.9)	40 (38.1)	0.30 (0.07-1.28)	0.103
Islam	3 (30.8)	9 (96.2)		
Employment status				
Unemployed	29 (55.8)	23 (44.2)	1.99 (0.77-5.13)	0.154
Employed	40 (60.6)	26 (39.4)		
Presence of Comorbidity				
Yes	32 (52.5)	29 (47.5)	2.28 (0.97-5.34)	0.059
No	37 (64.9)	20 (35.1)		

Adjusted Odds Ratios (AOR)

Table 3. Relationship between IPSS severity and significant depressive symptoms

Variables	Significant depressive symptoms		P-value
	Absent n (%)	Present n (%)	
IPSS			
Mild	15 (78.9)	4 (21.1)	0.017
Moderate	35 (63.6)	20 (36.4)	
Severe	19 (43.2)	25 (56.8)	

International Prostate Symptom Score (IPSS)

Table 4. Correlation between GDS scores, IPSS, duration of symptoms and Quality of life

		GDS	IPSS	DL	QoL
GDS	Correlation Coefficient	1			
IPSS	Correlation Coefficient	0.385**	1		
	Level of Significance	0.001			
DL	Correlation Coefficient	0.238**	0.131	1	
	Level of Significance	0.009	0.158		
QoL	Correlation Coefficient	-0.227*	0.348**	0.028	1
	Level of Significance	0.013	0.001	0.766	

** Correlation is significant at 0.01; * Correlation is significant at 0.05; International Prostate Symptom Score (IPSS); Geriatric Depression Scale (GDS); duration of LUTS (DL); quality of life (QoL).

As shown in Figure 2, higher proportions of those with mixed feelings, dissatisfied or unhappy with their sexual functioning compared with those who were satisfied or pleased had significant depressive symptoms.

Discussion

Depression among the elderly presents with increased risk of morbidity, decreased physical, and social functioning, and influences the prognosis of other chronic diseases negatively [14,16-18,20,21]. In this study, over forty percent of the participants presented with significant depressive symptoms, mostly in moderate to the severe form. This shows an appreciable number of patients with BPH were experiencing significant depressive symptoms. The prevalence in this study is higher when compared with what was reported in a large

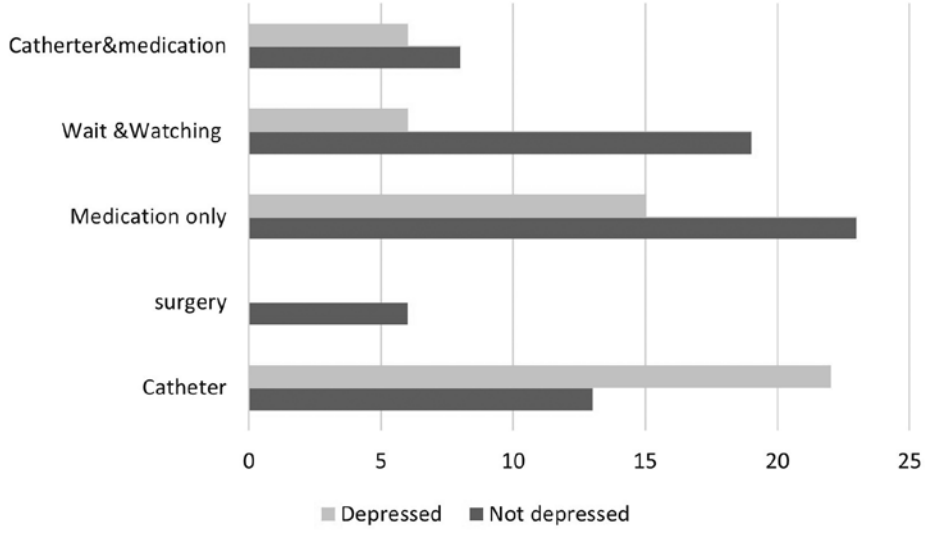

Figure 1. Treatment modalities and depression

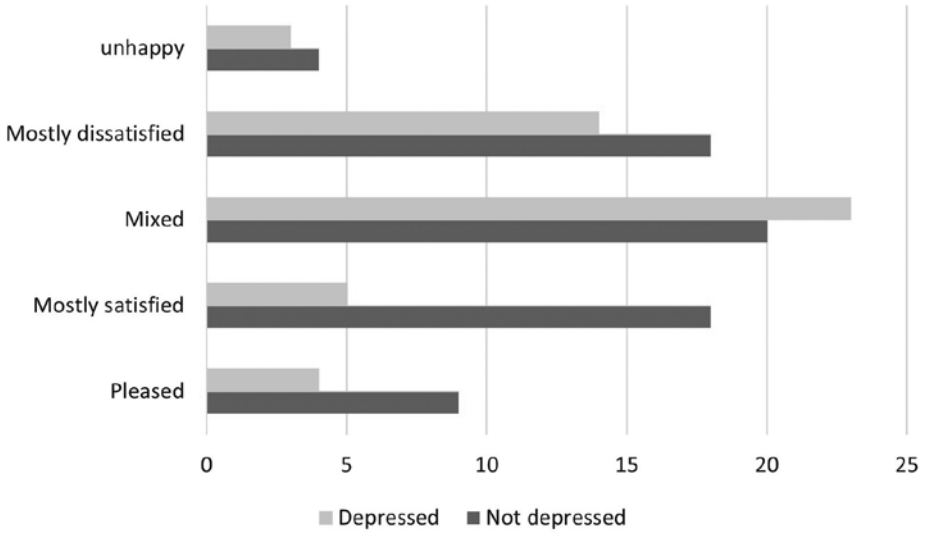

Figure 2. Relationship between sexual functioning and depression

observational study in Poland and the USA [24,32], or the general population of the elderly in this environment [16,19]. Several factors may explain the high burden of depression among people with BPH. These range from the poor overall quality of life due to LUTS [7,33], the deteriorating health, and the impact of medications used in the treatment of BPH [34], specifically 5á-reductase inhibitor. The incidence of depression was reported to be elevated during the initial months after initiating 5á-reductase, contrary to recent studies [25,35]. A common neurochemical pathway is being speculated to explain the association between depression and bladder function. A compelling association between central and peripheral serotonin (5-HT)/norepinephrine systems and lower urinary tract function has been consistently proposed [33,34,36,37].

Among this population, some socio-demographic factors increase the risk of experiencing significant depressive symptoms. Participants with higher education, who were Christian, without a spouse were less at risk of depression compared with their counterparts. Generally, the incidence of depression is lower among those with higher education compared with those with lower education [38-40]. Patients with higher education levels may have enhanced better mental health through indirect means or rather improved quality of life. Against the usual trend, a higher proportion of those with spouses had significant depressive symptoms. This may be due to a higher rate of erectile dysfunction (ED) among patients with BPH [24,41] coupled with social support such single elderly enjoys in this environment. The burden of erectile problems particularly among those with spouses may have created an additional emotional burden to this population of patients with BPH. Erectile dysfunction is associated with a higher incidence of depressive symptoms. This may be bidirectional, with ED complicating depression and depression complicating ED [24].

Findings from this study revealed that as the severity of urinary symptoms increases, the burden of depression increases. Studies have shown that men with severe LUTS are at greater risk of depression than those with less

severe urinary symptoms [22,24,34,42]. As urinary symptoms worsen, the burden of depression increases. This substantiates the need for improved treatment of LUTS and the identification of depressive symptoms in patients with BPH in order to improve their QoL.

In this study, a positive correlation between LUTS, depressive symptoms, and the quality of life was noted among the participants. As the urinary symptom worsens, depressive symptoms, as well as the overall quality of life worsens. Studies have repeatedly shown an association between depressive symptoms and poor quality of life on one hand [42], and QoL and LUTs on other hand [7]. This suggests that effort at improving the QoL of patients with BPH must aim at improved management of LUTs and depressive symptoms in this population.

Among various treatment modalities, a higher proportion of those on catheters was experiencing significant depressive symptoms. The burden of carrying catheters around may serve as a reminder of their health challenges, compared with those who had surgery or those who were on medication only. This calls for the need to ensure that treatment options are individually-tailored to reduce emotional reactions that may result from each treatment option. Providing information on various treatment modalities will help each patient to make an informed choice. This may go a long way in reducing any emotional reaction that may result from each treatment care option.

The strength of this study is that it is one of the few studies providing insight into the burden of depression and its association with LUTs and QoL in people living with BPH in this environment. Nonetheless, the study has some limitations. First, the cross-sectional nature of the research makes it difficult to infer causality. Again, depression is a common mental illness among the elderly, the absence of a control group in this study makes it difficult to infer direct causality. However, there was a high correlation between LUTs and depressive symptomatology and QoL index suggesting some degrees of association. In addition, other studies have reported similar findings supporting our findings. Besides, diagnosis of depression was not ascertained with a more structured clinical interview, nevertheless, the instrument used had been reported to have high sensitivity and reliability for diagnosis of depression in this population and was suitable for the desired study objectives.

Quite an appreciable number of patients with BPH were experiencing significant depressive symptoms. Several factors increase the risk of depression among this population, ranging from increasing age, low educational attainment, having a spouse, and the presence of other comorbid disorders. As the severity and duration of LUTs increase, the burden of depression increases. Nevertheless, the direction of the causality (either unidirectional or bidirectional) remains unclear. It is imperative to provide effective treatment of LUTS and evaluate patients with BPH for depression to reduce its burden and subsequently improve their quality of life.

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Conflict of interest

None to declare.

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Povezanost značajnih depresivnih simptoma i simptoma povezanih s prostatom u pacijenata s benignom hiperplazijom prostate

Sažetak - Uvod: Depresija je u starijih osoba povezana s povećanim morbiditetom te rizikom za narušeno tjelesno, kognitivno i socijalno funkcioniranje, s negativnim utjecajem na prognozu drugih kroničnih oboljenja. Ovo istraživanje je imalo za cilj ispitati teret depresije i njezin odnos sa simptomima povezanim s prostatom u oboljelih od benigne hiperplazije prostate (BPH). Metode: Ispitanici su ocijenjeni Gerijatrijskom skalom depresije (GDS) i Međunarodnom ocjenom simptoma prostate (IPSS). Povezanost između depresije i socio-demografskih varijabli procijenjena je multiplom logističkom regresijom, dok je povezanost između rezultata GDS-a, IPSS-a i trajanja simptoma donjeg urinarnog trakta (LUTS) procijenjena Spearmanovom korelacijom. Rezultati: Od ispitane populacije 41,1% je imalo značajne simptome depresije. Sudionici stariji od 65 godina AOR = 1,78, (95% CI = 0,61-5,16), sa nižim i srednjim obrazovanjem AOR = 3,63, (95% CI = 1,37-9,63), p = 0,01, nezaposleni AOR = 1,99, (95% CI = 0,77-5,13), ili su imali komorbidnu bolest AOR = 2,28, (95% CI = 0,97-5,34), p = 0,06 su bili skloniji depresiji. Utvrđena je pozitivna korelacija između rezultata GDS-a i IPSS-a (r = 0,385, p = 0,001), trajanja LUTS-a (r = 0,238, p = 0,009) i kvalitete života (QoL) (r = 0,227, p = 0,013), i između rezultata IPSS-a i QoL-a (r = 0,348, p = 0,001). Zaključak: Veći udio ispitanika je imao značajne simptome depresije, rizik od kojih je povećan i kliničkim i socio-demografskim varijablama.

Ključne riječi: depresija; simptomi povezani s prostatom; benigna hiperplazije prostate; simptomi donjeg urinarnog trakta; Nigerija