



Research Article

Relationship between Lower Urinary Tract Symptoms and Emotional State among a Sample of Clinic Attendees of a Tertiary Care Center in Central Sri Lanka

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Abstract

Introduction: Lower Urinary Tract Symptoms (LUTS) is a set of symptoms that correlates to the human urinary tract.

Among the many reasons associated with LUTS, numerous studies have shown an association between LUTS and the emotional state of patients. Various researches in different

geographical locations have been conducted to assess this relationship between LUTS and mental health in different ways. Findings from previous studies were highly dependent on the methodologies and criteria used. The purpose of this study is to evaluate any relationship between LUTS and the emotional state of patients in a sample of clinic attendees of General Urology (GU) clinic in Teaching Hospital, Peradeniya, Sri Lanka where the emotional state is assessed through criteria for depression, anxiety and stress. Here, International Prostate Symptom Score (IPSS) is used as the screening tool to evaluate LUTS and Depression Anxiety Stress Scale-21 (DASS-21) is used to quantify the emotional state.

Methodology: This is a descriptive, cross-sectional study performed among patients attending the GU clinic at Teaching Hospital Peradeniya, Sri Lanka to identify the relationship between LUTS and the emotional state. Study samples were collected from July 2020 to October 2021. Subjects were asked questions using a questionnaire on the presence of Lower Urinary Tract Symptoms and the emotional state. Data analysis was performed using SPSS version 20. The association between IPSS and DASS-21 scores was analyzed using simple linear regression analysis.

Results: The study group consisted of 161 patients who attended the GU clinic at the Teaching Hospital, Peradeniya. 84.5% of the sample was male while 15.5% was female. The mean age of the studied group was 62 ± 14.51 ($p < 0.005$). The highest prevalent symptom was nocturia (81%). The mean total IPSS score was approximately 17. Among 161 patients 36.17%, 50.35% and 30.5% people had mild – extremely severe depression, anxiety and stress respectively. According

to the coefficients of linear regression analysis, the most significant correlation was observed among LUTS and depression ($p = 0.001$). When IPSS score was increased by 1, depression score is predicted to be increased by .292. Similarly, when IPSS score was increased 1, anxiety score is predicted to be increased by .221 ($p = 0.003$) and stress score is predicted to be increased by .257 ($p = 0.008$).

Conclusion: A clear association of stress with the LUTS was observed in a sample of 161 patients attending the GU clinic at Teaching Hospital, Peradeniya. The most prevalent LUT symptom was nocturia. Anxiety was the most prevalent emotional issue out of stress, anxiety and depression. Maximum correlation was observed among depression and LUTS with a higher significance.

Keywords: Lower Urinary Tract Symptoms; Urology; Nocturia; Bladder; Emotional state

1. Introduction

Lower Urinary Tract Symptoms (LUTS) is a set of symptoms that correlates to the human urinary tract. They are broadly classified into storage symptoms and voiding symptoms. Storage symptoms include urgency, frequency, incontinence and nocturia whereas voiding symptoms include poor stream, sense of incomplete evacuation, dribbling, hesitancy, intermittency and prolonged micturition. Among the many reasons affecting LUTS, numerous studies have shown an association between LUTS and the emotional state of the patient. According to recent findings, there are pieces of evidence that this association between mental health and LUTS is bilateral. According to recent findings, the release

of pro-inflammatory cytokines and chemokines was significant during periods of chronic stress as well as in bladder dysfunction and pain via actions in the central nervous system and locally in the bladder [1] which shows a bilateral relationship between mental health and LUTS.

Various studies in different geographical locations have been conducted to assess this relationship. Findings from previous studies were highly dependent on the methodologies and criteria used. A cohort study carried out among men aged between 40-79 in 8 European centers used Study 36- item Short Form survey (SF-36), to assess quality of life, IPSS to assess LUTS, the Beck Depression Inventory-II (BDI-II) and the Physical Activity Scale for the Elderly (PASE) to assess physical activity and revealed a correlation between depressive symptoms and LUTS [2]. In a cross-sectional study among female nurses in China, the prevalence of LUTS associated with occupational stress was evaluated through questionnaires on LUTS and Occupational Stress Inventory-Revised (OSI- R) tests [3]. IPSS, the adapted Incontinence Impact Questionnaire-7 (IIQ-7), the Chinese (HK) SF- 12 Health Survey Version 2 (SF-12 v2) and the Depression, Anxiety and Stress Scale-21 (DASS-21) were employed by a group of researchers in Hong Kong to examine how mental health mediates the association between symptom severity and Health-Related Quality of Life in patients with Lower Urinary Tract Symptoms. This study found that, in order to improve health-related quality of life, LUTS interventions should address patients' mental health in addition to giving physical relief of symptoms [4].

In a study carried in Japan, LUTS were evaluated using IPSS, and the Overactive Bladder Symptom Score (OABSS).

Oxidative stress was evaluated by measuring 8- Hydroxy-20-deoxyguanosine (8-OHdG) and advanced glycation end products (AGEs) by urine analysis and skin auto fluorescence respectively. There, a significant association was observed between AGE levels and nocturia score > 1 [5]. A study performed in Korea used Prostate-Specific Antigen (PSA) in addition to IPSS to evaluate bladder function while depression diagnoses were made by a panel of 4 neuropsychiatrists according to the DSM-IV based on the data collected through the questionnaires. According to the findings, older men with depression are more likely to have more severe LUTS than men without depression. Urgency was found to be substantially linked to depression among the various urine symptoms. Patients with Moderate-severe LUTS, particularly urgency, may require a mental health assessment [6].

Depression, anxiety, and somatization may all have an impact on the clinical manifestations of LUTS/BPH, according to a Korean study. Further, anxious patients exhibited a lower response to treatment in LUTS/BPH. Despite limitations, it demonstrated that clinicians may need careful evaluation of psychiatric symptoms for the proper management of patients with LUTS/BPH. International Prostate Symptom Score (IPSS), the Patient Health Questionnaire-9 (PHQ-9), the 7-item Generalized Anxiety Disorder Scale (GAD-7) and the PHQ- 15 were used in that analysis [7]. Study which included 10,275 men who underwent routine health check-ups at the Healthcare System Gangnam Center of Seoul National University Hospital revealed that depression and its severity are strongly associated with total, voiding, and storage symptoms

independently of PV state. That analysis was performed using multivariate logistic regression analysis [8].

A descriptive study performed in Australia showed that there is a bidirectional relationship between storage, but not voiding, LUTS and both depression and anxiety. They observed variable moderation effects for selected inflammatory markers on the development of depression, anxiety and storage LUTS. According to their results, 16.3% (n = 108), 12.1 % (n = 88), 14.5 % (n = 108), and 12.2% (n = 107) of the patients had storage, voiding LUTS, depression, and anxiety, respectively. According to regression models, men with depression and anxiety at the beginning of the study were more likely to develop incident storage, but not voiding LUTS (OR: 1.26, 99%CI: 1.01-4.02; and OR: 1.74; 99%CI: 1.05-2.21, respectively) [9].

Our study aims at evaluating any relationship between LUTS and the emotional state of clinic attendees attending the GU clinic at Teaching Hospital, Peradeniya, Sri Lanka. The prevalence of LUTS was evaluated according to IPSS. It is a commonly used screening tool used in urology practice that evaluates the severity of LUTS namely, incomplete evacuation, and frequency of urination, intermittency, urgency, weak urine stream, straining and nocturia. The IPSS which consists of seven LUTS questions was used with an added question on dysuria in this study. Prevalence of those symptoms within the past month was evaluated. Scores are obtained as a scale on the frequency of each symptom. They can be added to give a total symptom score (ranging from 0 to 40), with a higher score indicating more severe symptoms.

Depression Anxiety Stress Scale -21 (DASS-21) is used to evaluate depression, anxiety, stress. Depression, anxiety and stress are emotional states of a person and DASS-21 helps to quantify these emotions within the past week prior to the assessment according to the intensity. It is a set of three self-report scales designed to measure the emotional states of depression, anxiety, and stress. For each section, seven questions were allocated and the applicability of each condition was scaled from 0 to 3. Total marks from each section were separately counted and multiplied by 2. According to the international standard ranges, severity of depression, anxiety and stress were checked. Higher scores of each section indicate poorer mental health [9]. Dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia are all assessed on the depression scale. Autonomic arousal, skeletal muscle effects, situational anxiety, and subjective sensation of anxious affect are measured on the anxiety scale. Chronic nonspecific arousal levels are sensitive to the stress scale. It evaluates difficulty in relaxing, nervous arousal, and being easily upset / agitated, irritable /Over-reactive and impatient [10]. Having a better understanding of the relationship between mental health and LUTS of the local community will be advantageous for both the general public and health professionals in the evaluation of psychiatric symptoms for the proper management of patients with LUTS.

2. Methodology

This is a descriptive, cross-sectional study performed among patients attending the general urology clinic at Teaching Hospital Peradeniya, Sri Lanka to identify the relationship between LUTS and stress. This study was conducted from

July 2020 to October 2021. Subjects were asked questions using a questionnaire on the presence of Lower Urinary Tract Symptoms, depression, anxiety and stress. Both IPSS and DASS-21 questionnaires were validated to Sinhala language and the questions were asked by trained invigilators through face-to-face interviews which usually last for about 5-10 minutes. All responses were recorded in a database. Data analysis was performed using SPSS version 20. Descriptive statistics were analyzed and the association between two scores was elaborated using simple linear regression analysis. The level of statistical significance was considered as <0.005 throughout the study.

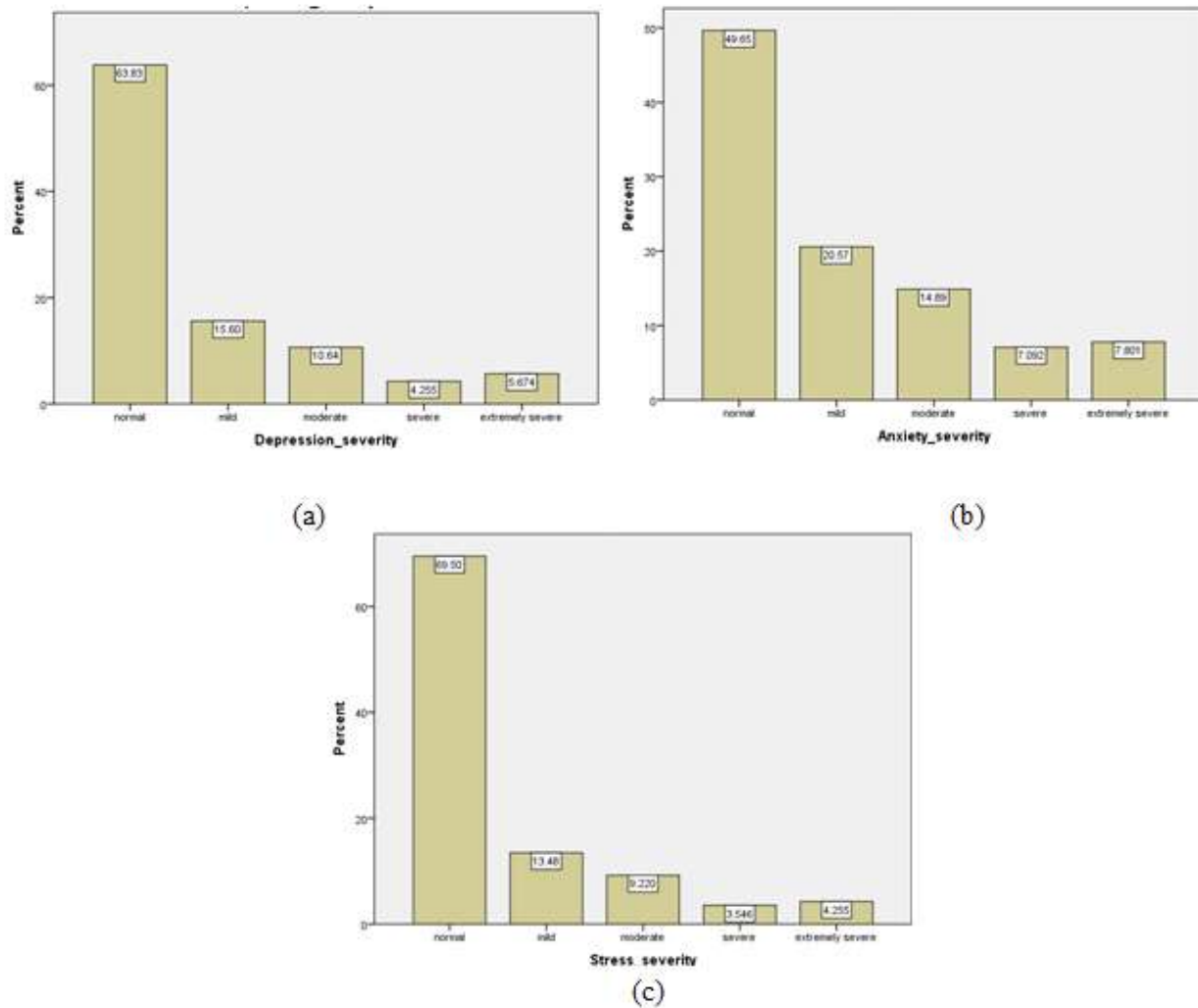
3. Results and Discussion

The study group consisted of 161 patients who attended the general urology clinic at the Teaching Hospital, Peradeniya, Sri Lanka. Study samples were recruited from July 2020 to

October 2021. 84.5% of the sample was male while 15.5% was female. The mean age of the studied group was 62 ± 14.51 ($p < 0.005$). According to the IPSS criteria, each lower urinary tract symptom was scaled from 0-5 in the ascending frequency of the symptom. According to the descriptive analysis (Table 1), the mean score for any symptom was not more than 3. Higher std. deviation values reveal the vast dispersion of data far from mean values. The highest prevalent symptom was nocturia (81%). The mean total IPSS score was approximately 17. Prevalence of depression, anxiety and stress among patients having moderate-severe LUTS (IPSS > 7) was assessed using following bar graphs. Among 161 patients 36.17%, 50.35% and 30.5% people had mild – extremely severe depression, anxiety and stress respectively. Accordingly, anxiety was the most prevalent factor out of depression, anxiety and stress.

Table 1: Descriptive statistics on LUTS evaluated in the study.

Criteria	Percentage of prevalence	Mean (SD)
Incomplete evacuation	49%	2.93 (2.23)
Frequency	41%	2.48 (2.20)
Urgency	31%	2.40 (2.30)
Intermittency	17%	2.00 (2.25)
Weak stream	37%	2.56 (2.26)
Straining	3%	1.42 (1.96)
Nocturia	81%	2.94 (1.81)
Dysuria	3%	1.24 (1.88)
Total IPSS	-	16.93 (9.45)



Graph 1: Graph of prevalence of depression (a), anxiety (b), stress (c)

Further correlation between IPSS of patients with moderate-severe LUTS and the emotional state was analyzed using simple linear regression. All assumptions were matched for the simple linear regression. Here, depression severity, anxiety severity and stress severity were the dependent variables while the IPSS was the predictor. According to the coefficients, the most significant correlation was observed among LUTS and depression ($p = 0.001$). When IPSS score

was increased 1, depression score is predicted to be increased by .292 (Table 1). Similarly, when IPSS score was increased 1, anxiety score is predicted to be increased by .221 ($p = 0.003$) (Table 2) and stress score is predicted to be increased by .257 ($p = 0.008$) (Table 3). Accordingly, the maximum correlation with LUTS was shown by depression with a higher significance.

Table 2: Results from simple linear regression analysis between depression score and IPSS score.

	Significance	B	Std. error	Tolerance	VIF
(Constant)	0.21	2.455	1.949		
IPSS	0.001	0.292	0.087	1	1

Dependent Variable: Depression score

Predictors: (Constant), IPSS

Table 3: Results from simple linear regression analysis between anxiety score and IPSS score.

	Significance	B	Std. error	Tolerance	VIF
(Constant)	0.058	3.172	1.659		
IPSS	0.003	0.221	0.074	1	1

Dependent Variable: Anxiety score

Predictors: (Constant), IPSS

Table 4: Results from simple linear regression analysis between stress score and IPSS score.

	Significance	B	Std. error	Tolerance	VIF
(Constant)	0.02	5.03	2.133		
IPSS	0.008	0.257	0.096	1	1

Dependent Variable: Stress score

Predictors: (Constant), IPSS

Our study was a cross-sectional analysis performed within around 1 year. There, a significant association between IPSS and DASS-21 scores was revealed. A longitudinal study with a control sample in the future may be carried out to identify the bilateral association of stress and LUTS in this particular sample. Inability to assess whether the prominent reason for above mental issues was LUTS or any other cause is a limitation of this study. To evaluate the effectiveness of treatment for LUTS in improving the emotional state of the patients will be studied in the future through constant follow-up of clinic attendees.

4. Conclusion

Prior studies have shown an association between LUTS and the mental health considering various criteria and they were evaluated using different scales. In our study, IPSS and DASS-21 scores were used to collect data from subjects. The most prevalent LUT symptom was nocturia (81%). Anxiety was the most prevalent mental issue (50.35%) out of stress, anxiety and depression. Maximum correlation was observed among depression and LUTS with a higher significance according to simple linear regression analysis ($B = 0.292$, $p = 0.001$).

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