African Journal of
Clinical Medicine and Pharmacy Research

ISSN: 3434-2990

Index: Harvard, Boston, Sydney University, Dimensions, Lens, ResearchGet Scilit, Semantic, Google Scholar, Base etc

https://doi.org/10.58578/AJCMPR.v2i2.5279

A Cross-Sectional Survey of Lower Urinary Tract Symptoms and Its Association with Lifestyle and Toiletting Behaviour of Young Female Undergraduates in South-West Nigeria

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Article Info:

Submitted:	Revised:	Accepted:	Published:
Feb 27, 2025	Mar 12, 2025	Mar 24, 2025	Mar 29, 2025

Abstract

Introduction: Previous studies have explored Lower Urinary Tract Symptoms (LUTS) among elderly females and the middle aged, yet limited studies have been carried out on the apparently healthy younger female population especially in Nigeria. This study investigated the prevalence of LUTS, and its association with toileting behaviours, and lifestyle of young Nigerian female undergraduates. **Methods:** This cross-sectional study was conducted among 345 female undergraduates of Bowen University Iwo, Osun State, Nigeria aged 17 to 24 years. All participants completed the International Consultation on Incontinence Modular Questionnaire for Female Lower Urinary Tract Symptoms (ICIQ-FLUTS), socio-demographic form and a toileting behavior data form. Spearman's correlation test and Chi square were used for inferential statistics at 0.05 level of significance. **Results:** There was no significant relationship between LUTS and each of caffeine intake, carbonated drink

intake and participation in physical activities. However, there was a significant association between sexual activity and filling symptoms (p=0.014), and incontinence symptoms (p=0.020), but no significant association with voiding symptoms (p=0.668). There was also no significant association between LUTS and toileting behaviour of participants. **Conclusion:** This study found high prevalence of LUTS among young female undergraduates. There was also an association between sexual activity and LUTS among participants. However, intake of caffeine and carbonated drinks, as well as lack of physical activity were found not be associated with LUTS in this population. Similarly, toileting behaviours had no association with LUTS, however, an experimental study design is recommended to further explore this.

Keywords: Lower urinary tract symptoms (LUTS), Lifestyle, Toileting behaviour

INTRODUCTION

The International Continence Society (ICS) defines Lower Urinary Tract Symptoms (LUTS) as a term that covers symptoms that result from conditions and diseases affecting the bladder and urethra[1]. These symptoms are: storage, voiding and post micturition symptoms[2]. Storage symptoms include the overactive bladder symptoms (frequency, urgency, nocturia and urge incontinence) as well as pain and stress incontinence symptoms such as haematuria and dysuria[3]. Voiding symptoms include slow and/or interrupted stream, terminal dribble hesitancy and straining. Post micturition symptoms include post micturition dribble and the sensation of incomplete emptying[3]. A study by[2] estimated that the number of people experiencing LUTS worldwide were about 1.9 billion and also predicted that by 2018 it may reach 2.3 billion people worldwide. A population-based survey conducted in China reported that 61% of men and women aged ≥ 18 years had at least 1 LUTS[4].

As LUTS may be highly bothersome, some experts suggest that the aggravation it causes may be mostly related to patient perspective irrespective of how researchers define LUTS[5] . For both men and women, we found that storage symptoms were more bothersome than voiding or post-micturition symptoms. The LUTS study data also showed that leaking urine during sexual activities was the most frequently reported bothersome symptom by 82% of participants[5]. Other international and multinational survey studies confirmed associations between LUTS and poor quality of sexual life[6]. The 2006 U.S National Health

and Wellness Survey data showed that LUTS is significantly associated with increasing emergency room visits, doctor visits, and hospitalizations (odds ratios: 1.57, 1.52, and 1.56, respectively), as well as greater loss of work productivity (8.03%) than normal controls[7] . Lifestyle factors, such as fluid intake (caffeine, alcohol), physical activity (specifically high impact athletics), smoking, poor hygiene practices, stress, consumption of common bladder irritants, common during college years, have been associated with exacerbated LUTS[8]. Also, LUTS has been linked to several dysfunctional toileting or elimination behaviors by[8,9]. The college years, which span the late teens and mid-20s, are a significant and transformative period in the lives of many women, as they shape lifestyle choices and health habits that frequently carry over into adulthood[8,9] . As a result, understanding the experience of LUTS and health-seeking behaviors in a college population can help to shape future clinical practice and research across the life course[8] . A study carried out at Ladoke Akintola University of Technology, Ogbomoso (LAUTECH), among apparently healthy young non-pregnant female medical and nursing students, with the aim of determining the prevalence of LUTS among apparently healthy young Nigerian women with at least one LUTS found that the prevalence was 55.2% [10]. Another study carried out in Malaysia among nulliparous medical students with the aim of determining the prevalence (LUTS) among young age medical population found that the prevalence of LUTS was 52.7% [11]. However, these studies were conducted about 8 and 13 years ago respectively, hence there is a need for a more recent study in a general student population to assess the prevalence of LUTS and the relationship with predisposing lifestyle factors among young female undergraduates, hence, the need for this study.

METHODS

The Slovin's formula was used to calculate the sample size n= 345 in this cross sectional survey[12] . The participants were female undergraduates of Bowen University Iwo campus from the 7 colleges and they were recruited using a consecutive sampling technique. Ethical approval was sought and obtained from the Health Research and Ethics Committee (HREC) of the Bowen University Teaching Hospital (BUTH) before commencement of the study. The purpose of this study was explained to the participants and informed consent was obtained. Socio-demographic form was used to collect socio-demographic variables of the participants including the consumption of bladder irritants and regularity of

physical activity. Then, the International Consultation on Incontinence Questionnaire Female Lower Urinary Tract Symptoms Module (ICIQ-FLUTS) and a toileting behavior data form were administered. The ICIQ-FLUTS is a self-administered questionnaire used in evaluating female lower urinary tract symptoms which consists of 13 sections, subscale 1 is for the date of birth of the participant, while sections 2-13 ask questions on nocturia, urgency, bladder pain, frequency, hesitancy, straining, intermittency, urinary urge incontinence, frequency of urinary incontinence, stress urinary incontinence, unexplained urinary incontinence and nocturnal enuresis respectively. While the self-developed and content validated toileting behaviour data form was used to assess the toileting behaviour of participants, it contained questions covering personal hygiene and toileting behaviour. The instrument was pilot tested among 20 participants and cronbach's alpha value obtained was 0.70. Descriptive statistics of mean, standard deviation, frequency distribution, and percentages were used to summarize the participants' socio-demographic data. Spearman's correlation test was used to determine the relationship between LUTS and social aspects & socio-demographic variables of the participants. Chi square test was used to determine the association between LUTS and toileting behaviour, and between LUTS and sexual activity of participants. Level of significance was set at 0.05.

RESULTS

A total of 345 female undergraduates of Bowen University, Iwo, Osun state, Nigeria, participated in this study with a mean age of 19.68±1.560 (years) and majority (80.2%) were aged between 17 to 20 years and (19.8%) were between 21 to 24 years. With respect to the lifestyle of the Participants; More than half reported not taking beverages containing caffeine (61.7%) in a day, (35.9%) take 1-2 cups, and (2.3%) took more than 3 cups in a day. Also, 42.6% of participants did not take carbonated/caffeinated drinks while (35.3%) took 1-2 bottles or cans, and (4.1%) took more than 3 bottles or cans of carbonated drinks in a day. More than half (55.9%) of participants did not partake in physical activity that lasted 60 minutes in a week, 22.9% partook 3 or more times a week, 7.8% partook 2 times a week and (13.3%) partook once a week (Table 2). As for personal hygiene and toileting behaviour, (36.8%) of participants bathed once daily, (59.1%) twice daily, and (4.1%) three or more times. Vaginal douching was practiced by (29.6%), while (70.4%) did not douche. Washing the inner part of labia majora was done by 253(73.3%) of participants while

92(26.7%) did not. Underwear was washed with water only by 15(4.3%), with soap by 110(31.9%), detergent powder by 215(62.3%), and detergent liquid by 5(1.4%). After urination, 288(83.5%) participants reported that they dried themselves, 273(94.8.1%) used disposable towels and 15(5.2%) used non-disposable towels. Additionally, 269(78.0%) dried their underwear under the sun, 76(22.0%) did not dry their underwear under the sun and 289(83.8%) washed their underwear separately from other clothes.

The frequency of underwear changing varied widely among the participants: 114(33.0%) require no changed, 146(42.3%) changed once, 82(23.8%) changed 2-3 times, while 3(0.9%) changed more than 5 times daily. During menstruation, (2.6 %) did not change pads, 21.4% changed once, (64.6%) changed 2-3 times and (11.3%) changed 4-5 times daily. While on school premises, 158(45.8%) sit on toilet seats while 187(54.2%) did not. Post-defecation, 222(64.3%) wiped front to back and 123(35.7%) back to front. Among the 34(9.9%) sexually active participants, 25(73.5%) washed immediately after intercourse. Pant liners were used by 175(50.7%), with 38(21.7%) not changing them, 80(45.7%) changed once, 51(29.1%) changed 2-3 times, 4(2.3%) changed 4-5 times, and 2(1.1%) changed more than 5 times daily (Table 1). In summary, only 17(4.9%) of participants had healthy toileting behaviours, more than half 319(92.5%) had a moderately healthy toileting behaviour and 9(2.6%) had unhealthy toileting behaviours.

As for LUTS, 79.7% of participants reported mild filling symptoms, with 17.1% reporting moderate symptoms, and (0.3%) reporting severe symptoms while (2.9%) had no filling symptoms at all. Regarding voiding symptoms, (58.6%) of participants experienced mild symptoms, (5.2%) had moderate symptoms, and (0.3%) had severe symptoms, while (35.9%) had no voiding symptoms at all. In terms of incontinence symptoms, (56.8%) of participants reported mild symptoms, (6.1%) had moderate symptoms, and (0.3%) had severe symptoms, whereas (36.8%) reported no incontinence symptoms as shown in (Table 3). There was no significant relationship between filling symptoms and caffeine intake ($p=0.197$), carbonated/caffeinated drink intake ($p=0.702$) and physical activities ($p=0.206$). Also, there was no significant relationship between voiding symptoms and caffeine intake ($p=0.112$), carbonated/caffeinated drink intake ($p=0.769$) and physical activities ($p=0.213$). Lastly, there was no significant relationship between incontinence symptoms and caffeine intake ($p=0.316$), carbonated/caffeinated drink intake ($p=0.894$) and physical activities ($p=0.082$) (Table 4).

There was no significant association between toileting behaviours and filling symptoms (p=0.951), voiding symptoms (p=0.926) and incontinence symptoms (p=0.439) (Table 5). This survey found a significant association between sexual activity and filling symptoms (p=0.014), and incontinence symptoms (p=0.020), but no significant association with voiding symptoms (p=0.668) (Table 6). Furthermore, filling symptoms (p=0.801), voiding symptoms (p=0.113) and incontinence symptoms (p=0.373) are not significantly related with age. Similarly, there was no significant relationship between the level of study of the participants and filling symptoms (p=0.903), voiding symptoms (p=0.489) and incontinence symptoms (p=0.359).

Table 1: Toileting behaviours of Participants

Toileting Behaviours		Frequency	%
Frequency of Daily Bathing (per day)	1	127	36.8
	2	204	59.1
	3 or more	14	4.1
Vaginal Douching	Yes	102	29.6
	No	243	70.4
Washing Inner part of labia majora	Yes	253	73.3
	No	92	26.7
Washing Underwear	Water only	15	4.3
	Soap	110	31.9
	Detergent powder	215	62.3
	Detergent liquid	5	1.4
Drying After Each Urination	Yes	288	83.5
	No	57	16.5
If Yes, Using	Disposable towel (tissue)	273	94.8
	Non-disposable towel	15	5.2
Drying Underwear Under the Sun	Yes	269	78.0
	No	76	22.0
Washing Underwear Separately from Other Clothes	Yes	289	83.8
	No	56	16.2
Frequency of Changing Underwear	No change required	114	33.0
	1 time	146	42.3
	2-3 times	82	23.8
	4-5 times	0	0
	More than 5 times	3	0.9
Frequency of Changing Pads During Menstruation	No change required	9	2.6
	1 time	4	21.4
	2-3 times	223	64.6
	4-5 times	39	11.3
	More than 5 times	0	0

Sitting on Toilet Seat in School	Yes	158	45.8
	No	187	54.2
Washing and Wiping After Defecation	From front to back	222	64.2
	From back to front	123	35.7
Sexually Active Women	Yes	34	9.9
	No	311	90.1
If Yes, Washing After Intercourse	Yes	25	73.5
	No	9	26.5
Wearing Pant Liners	Yes	175	50.7
	No	170	49.3
If Yes, Frequency of Changing Pant Liners	No change required	38	21.7
	1 time	80	45.7
	2-3 times	51	29.1
	4-5 times	4	2.3
	More than 5 times	2	1.1

Table 2: Lifestyle of participants

Social Variables		Frequency	%
Caffeine Intake (Cups/Cans per day)	0	213	61.7
	1-2	124	35.9
	>3	8	2.3
Carbonated Drinks (Bottles/cans per day)	0	147	42.6
	1-2	184	53.3
	>3	14	4.1
Physical Activities participation (per week)	0	193	55.9
	3 or more times	79	22.9
	2 times a week	27	7.8
	Once a week	46	13.3

Table 3: Lower urinary tract symptoms among Participants

Lower Urinary Tract Symptoms		Frequency	%
Filling			
	No symptom	10	2.9
	Mild	275	79.7
	Moderate	59	17.1
	Severe	1	0.3
Voiding Symptom			
	No symptom	124	35.9
	Mild	202	58.6
	Moderate	18	5.2
	Severe	1	0.3
Incontinence Symptom			
	No symptom	127	36.8
	Mild	196	56.8
	Moderate	21	6.1
	Severe	1	0.3

Table 4: Relationship between LUTS and Lifestyle of participants

Spearman rank coefficient	Lower Urinary Tract Symptoms					
	Filling symptoms		Voiding Symptoms		Incontinence symptoms	
	r	p-value	r	p-value	r	p-value
Caffeine Intake	0.070	0.197	0.086	0.112	0.054	0.316
Carbonated drink Intake	-0.021	0.702	0.016	0.769	0.007	0.894
Physical Activity participation	-0.068	0.206	-0.067	0.213	-0.094	0.082

Table 5: Association between LUTS and toileting behaviour of participants

Lower Urinary tract symptoms		**Toileting behaviours**				
		Healthy practices	Moderately healthy	Unhealthy habits	x^2	p-value
Filling symptoms	No symptom	0	10	0	1.620	0.951
	Mild	13	254	8		
	Moderate	4	54	1		
	Severe	0	1	0		
Voiding symptoms	No symptom	4	117	3	1.930	0.926
	Mild	12	184	6		
	Moderate	1	17	0		
	Severe	0	1	0		
Incontinence symptoms	No symptom	5	116	6	5.858	0.439
	Mild	10	184	2		
	Moderate	2	18	1		
	Severe	0	1	0		

Table 6: Association between Lower Urinary Tract Symptoms and sexual activity of participants.

Lower Urinary tract symptoms		**sexual activity**			
		Yes	No	x^2	p-value
Filling symptoms	No symptom	0	10	10.558	0.014*
	Mild	26	249		
	Moderate	7	52		
	Severe	1	0		
Voiding symptoms	No symptom	10	114	1.563	0.668

	Mild	21	181		
	Moderate	3	15		
	Severe	0	1		
Incontinence symptoms	No symptom	11	116	9.821	0.020*
	Mild	19	177		
	Moderate	3	18		
	Severe	1	0		

*Significant at $p \leq 0.05$

DISCUSSION

The mean age of participants in this study was 19.68±1.560 (years) and ranged from 17 to 24 years and majority (76.5%) were between the ages of 18 and 21 years old. This is not far from reports of a study conducted among female undergraduates in America who had a mean age of 20.3 years and mostly (89.2%) were between the ages of 19 and 21 years old[8] . The overall percentage of participants with at least one LUTS in this study was 79.7%. In contrast to this is the study conducted by[13] which found the prevalence of LUTS to be 94.3% among presumably healthy Nulligravid female medical students (aged 18–30 years), and[10] who reported an overall prevalence 55.2% of LUTS among apparently healthy young non-pregnant female medical and nursing students aged 18 to 34 years at Ladoke Akintola University of Technology (LAUTECH). In this study, there was no significant relationship between LUTS, caffeine intake and carbonated/caffeinated drinks intake. This is similar to findings by[8] that found no association between caffeine, alcohol consumption and the severity of LUTS. Another study by[14] also reported that there was no significant relationship between LUTS and caffeine consumption in women.

In terms of physical activity, this study founds no relationship between LUTS and physical activity. This finding is in agreement with the study conducted by[15] among adolescent girls which reported no significant association between LUTS and physical activity. Conversely,[16] found that a low level of physical activity was associated with a 2 to 3 time's greater likelihood of LUTS. Additionally, a study by[17] among sport women, found an

increased prevalence of stress urinary incontinence among volleyball, basketball and handball player. Also, this study identifies a significant relationship between LUTS and sexual activity among young female undergraduates. Similar to this, a study conducted by[8] also found a significant relationship between LUTS and sexual activity. In fact,[8] reported that participants who were sexually active were almost twice as likely to experience relevant LUTS severity when compared to those who were not. Conversely,[18] reported a statistically significant higher prevalence of LUTS in women with no sexual relationship compared to women having sexual relationship in an observational study. The difference in findings could be attributable to the study designs and the population sizes. While this study had a small population of sexually active young female adults, and was also a cross sectional survey, the study by [18] was longitudinal and involved a larger population.

Considering toileting behaviours: majority of the participants (92.5%) had moderately healthy toileting behaviours; however not statistically significant. In contrast to findings from this study,[19] in a study conducted among adults between the age of 18 to 93 years reported statistically relevant relationships between four toileting behaviors and LUTS; premature voiding, delayed voiding, straining to void and preference for non-sitting positions when voiding. Also, another study by [20] among women aged 18 to 25 years reported a statistically relevant significance between LUTS and toileting behaviours. Additionally,[21,22] in a cross sectional study among women who limited their restroom use at work found that the prevalence of women who had LUTS was significantly higher among women who delayed voiding.

CONCLUSION

The findings from study reveal that younger females battle with LUTS as well. Therefore, given that many health-related conditions and behaviours established during the college years may persist into adulthood, identifying the experiences of LUTS in this population is important in promoting screening and developing effective multi-targeted interventions to reduce symptoms in these young women and prevent more severe LUTS later in their lives. Therefore, it is recommended that healthcare providers and public health officials should create educational programs for young female adults on healthy lifestyles, normal toileting behaviors and bladder health. Also, longitudinal cohort observational studies are recommended among this population to further explore the relationship between sexual

activity, toileting habits and LUTS, and also to establish the effects of LUTS on the quality of life of young female adults. These studies will provide more insight into the etiology and predisposing factors for these symptoms.

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