The Prevalence of Lower Urinary Tract symptoms (LUTS) and incontinence in Iranian Women

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Purpose: Lower Urinary Tract Symptoms (LUTS) affect many women worldwide. The prevalence of LUTS among Iranian women has not been reported. The aim of the present study was to evaluate the prevalence of Lower Urinary Tract Symptoms and its bother rate among women ≥20 years old living in Isfahan, a central province of Iran.

Materials and Methods: This was a descriptive cross-sectional study. The data was collected using a population-based survey on women aged ≥ 20 years selected from the general population of Isfahan (a central province of Iran. A total of 2609 women were approached for the study. After obtaining demographic features, the participants completed the Persian version of the International Consultation on Incontinence Modular Questionnaire for Female Lower Urinary Tract Symptoms (ICIQ-FLUTS).

Results: 95.5% of the participants had at least one Lower Urinary Tract Symptoms. The most common symptoms were urgency (82.4%) and stress urinary incontinence (44.5%). Nocturia (one or more occasions) was also noted in 60.7%. The highest bother rate was related to urgency.

Conclusion: The prevalence of Lower Urinary Tract Symptoms was high in the studied women. Among Lower Urinary Tract Symptoms, urgency and nocturnal enuresis were the most and the least frequent symptoms. However, the bother rate of the symptoms was relatively low.

Keywords: Iran; lower urinary tract symptoms (LUTS); prevalence; women

INTRODUCTION

Signs and symptoms related to urine storage and voiding are resulted from dysfunctions of lower urinary tract system. These may include detrusor over-activity, sphincter weakness or sensory bladder disorders[1].The international sub-committee of standardization of urinary incontinence has classified Lower urinary tract symptoms (LUTS) into three sub-groups including those related to urine storage, voiding and post-micturation. LUTS also presents with pain in lower urinary tract system. LUTs may be associated with overactive bladder or urine incontinence[2]. LUTS is especially seen after the age of 40, and its frequency increases with age affecting many individuals older than 70 years old[3]. Based on the predictions on the aging of world's population, the worldwide prevalence of LUTS is gradually raising[4].

The prevalence of LUTS is variable in different populations depending on the age, gender, types of symptoms and cultural aspects of the societies[5]. Epidemiological studies have shown the prevalence of 40-70% of LUTS among women. Among these, nocturia has been reported as a common symptom affecting 45-70% of women [1,4-6].

LUTS negatively affects the quality of life leading to depression, anxiety, exasperation, stress, and reduced sexual activity and satisfaction. Despite this, not all people visit physicians due to feelings shame and embarrassment[7]. Gathering information regarding the true prevalence of these symptoms can help to implement therapeutic and preventive measures. There are few epidemiological evidences about the prevalence of LUTS among Iranian women. Therefore, the aim of present study was to assess the prevalence of LUTS among women older than 20 years old in Isfahan, a central province of Iran. We then referred the women with incommodious symptoms to specialized health care centers for further management.

MATERIALS AND METHODS

This was a descriptive and cross-sectional population-based survey performed on women within 2016 to 2018 in Isfahan, a city in central region of Iran. Considering the report of the statistical center of Iran on the Isfahan's population in the latest population and household survey in Iran (2016), and taking into account a 10% drop in data gathering phase, the final sample size was decided as 3000. These women were randomly selected from 15 districts of Isfahan. The study was approved by the local Ethics Committee of Isfahan University of medical Sciences (IR.MUI.REC.1396.3-251). The inclusion criterion was age ≥ 20 years. All the participants were requested to sign a written informed consent before entering to the study.

LUTS was assessed using a standardized protocol based on the international continence society (ICS) definitions. We particularly emphasized on the storage and voiding symptoms. After filling out the consent and the

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Table 1. Sample demographic information (N=2609).

Variables	N (%)
BMI:	
≥25	1237 (51.2)
<25	1044 (48.8)
Educational background:	
Primary school	866 (33.6)
High school	791 (30.7)
University	919 (35.7)
Job:	
Housewife	1799 (69.4)
Employer & student	690 (26.6)
Self-employment	105 (4)
Marital status:	
Single	2185 (84.6)
Married	398 (15.4)
Menstrual status :	
premenopausa	1928 (75.4)
menopausal	628 (24.6)
delivery:	
Vaginal	
Cesarean section	958 (37.2)
Vaginal delivery & Cesarean	819 (31.8)
Nulliparity	237 (9.2)
Pregnant	558 (21.7)
	73 (2.8)
Medical history:	
Pelvic malignancy	
Uterus, ovary and vaginal surgery	21 (0.8)
Diabetes	183 (7)
Urinary tract infection and medical	107 (4.1)
care	316 (12.1)
Neurologic condition	13 (0.5)

demographic form, the participants were asked to complete the International Consultation on Incontinence Modular Questionnaire for Female Lower Urinary Tract Symptoms (ICIQ-FLUTS) previously validated in Persian (Cronbach's alpha & ICC= 0.83)[8]. In addition to the assessment of symptoms by Likert scale (never, occasionally, sometimes, most of the time, all of the time), the ICIQ-FLUTS questionnaire also estimates the bother score of the symptoms considering the score of 0 for no suffering and 10 for maximum suffering. According to the ICS guidelines, responding "occasionally" or "sometimes" to any response was regarded as positive. Also, voiding more than 8 times per day and one or more times at night were interpreted as positive symptom of daytime frequency and nocturia, respectively. Characteristics of the study population, prevalence of LUTS and other syndromes were presented as numbers and/or percentages with 95 % confidence intervals (CIs). Also mean values with standard deviation (SD) and median values with interquartile ranges (IQR) were calculated. All the statistical analyses were performed using SPSS V16.0 software (SPSS, Chicago, IL, USA).

RESULTS

A total of 3000 individuals were approached for the study, in order to enroll a sample of 2609. Thus, the response rate was 87%. The overall mean age of the participants was 40.5 ± 12.24 years old(20-87). The number of deliveries was between 0 to 10 while 87% of participants reported less than 4 deliveries. The participants' demographic features have been presented in **Table 1**. The total missing data was 6.9%.

95.5%, and 79.9% of the subjects responded "occasionally" and "sometimes" to one or more symptoms, respectively, and 110 (4.5%) reported no symptoms by marking the "never" for all the queries. The prevalence of the symptoms has been noted in **Table 2**.

Among storage related symptoms, the most frequent was urgency (82.4%) following by nocturia (60.7%)and daytime frequency (9.6%). Among incontinence symptoms, stress urinary incontinence (SUI) constituted the most encountered symptom (44.5%) following by urgency urinary incontinence (UUI) (36.3%), unexplained incontinence (16.2%) and nocturnal enuresis (5.8%). Among voiding symptoms, intermittency (44.8%), hesitancy (31.5%), and straining (21.3%) constituted the most common encountered issues (**Table 2**).

The mean age of the individuals with LUTS(40.37±12.22) was higher in comparison with those without LUTS (36.38 ± 12.70); however, the difference was not statistically significant(P = 0.065).

The prevalence of the symptoms was obtained 92.9% among 20-29 years old women. This showed an increasing trend with aging; however, a decrease was observed in the prevalence of the symptoms in ≥70 years old group (**Table 3**).

Nocturia, which was defined based on the ICS definition (waking up at least one time at night to urinate) was observed in 60.7% and 18.4% of the participants voided at least twice per night. Furthermore; 66.5%, 23.8% and

Table 2. Prevalence(%,95CI) each symptom according Likert score.

SYMPTOM	NEVER (0) n (%, 95%CI)	OCCASIONALLY(1) n (%, 95%CI)	SOMETIMES (2) n (%, 95%CI) (4)	MOST OF THE TIME(3) n (%, 95%CI)	ALWAYS(4) n* (%y, 95%CI)
urgency	449 (17.6%,14-21.1)	975 (38.2%,35.1-41.2)	834 (32.7%,29.5-35.8)	234 (9.2%,5.5-12.9)	61 (2.4%,0-6.2)
Pain	1408 (55.2%,52.6-57.8)	656 (25.7%,22.3-29)	412 (16.2%,12.6-19.7)	58 (2.3%,0-6.1)	16 (0.6%,0-4.3)
hesitancy	1737 (68.5%,66.3-70.6)	501 (19.8%,16.3-23.2)	237 (9.4%,5.6-13.1)	37 (1.5%,0-5.4)	22 (0.9%,0-4.8)
Straining	1997 (78.7%,76.9-80.5)	333 (13.1%,9.4-16.7)	162 (6.4%,2.6-10.31)	36 (1.4%,0-5.2)	10 (0.4%,0-4.3)
intermittency	1401 (55.2%,52.6-57.8)	707 (27.9%,24.5-31.2)	322 (12.7%,9-16.3)	92 (3.6%,0-7.4)	14 (0.6%,0-4.6)
Urgency incontinence	1620 (63.7%,61.3-66)	525 (20.6%,17.1-24)	331 (13%,9.3-16.6)	50 (2%,0-5.8)	17 (0.7%,0-4.6)
Stress incontinence	1410 (55.5%,52.9-58)	582 (22.9%,19.4-26.3)	377 (14.8%,11.2-18.3)	116 4.6%,0.7-8.4)	56 (2.2%,0-6)
Unexplained incontinence	2130 (83.8%,82.2-85.3)	238 (9.4%,5.6-13.1)	143 (5.6%,1.8-9.3)	23 (0.9%,0-4.7)	9 (0.4%,0-4.5)
Nocturnal enuresis	2400 (94.2%,93.2-95.1)	99 (3.9%,0-7.7)	40 (1.6%,0-5.4)	5 (0.2%,0-4.1)	3 (0.1%,0-3.6)

Table 3. Prevalence each symptom in different age groups.

Symptoms	20-39yr$^{\alpha}$ (n=1307)	40-59yr$^{\alpha}$ N=1019	60≥ yr$^{\alpha}$ N=251
nocturia	51.15	69.8	82.6
urgency	79.5	84	86
Bladder pain	45	48	34.2
Frequency $^{\beta}$	9.1	12.1	10.2
hesitancy	29.5	32.2	41.5
straining22.5	22	28.4	
Intermittency	42.1	48.2	52
Urge incont.	24.1	48.4	64.5
Stress incont	32.1	55.6	65
Unexplained incont.	9.3	24.2	28.2
Nocturnal enuresis	2.9	9	14
Every LUTS	93.7	96.3	97.6

$^{\alpha}$: age group and weight (%) , $^{\beta}$: more than 8 times per day

9.6% of the participants noted 1-6, 7-8, and more than 8 times daily urinations, respectively. According to ICS definition, 21.69% of the studied women had overactive bladder (OAB) syndrome with 54.1% of them suffering from UUI.

According to the patients' self-reports, the history of urinary tract infection needing urologist appointment was observed in 12.1%within the past six months. Among these, the urgency, UUI, and daytime frequency were identified with respective frequencies of 88.3%, 44.2%, and 15.9%. The highest bother score belonged to urgency and SUI with mean score of 2.45 and 1.84 respectively. The lowest bother score belonged to nocturia enuresis (mean score :0.37).

DISCUSSION

The aim of the present study was to ascertain the prevalence of urinary symptoms in the general population of Iran. In our study a normal distribution was observed in age.

In present study, in 95.5% of the population, however, LUTS were either evidently or silently observed. Urgency showed the highest frequency and bother score in comparison with other symptoms. In other studies, this symptom has also been reported as either the first or second common presentation (12.8-35%)[5,7,9]. The high prevalence of this symptom may be related to dietary regimens and consuming stimulant beverages, the lack of mobility, depression and anxiety[10,11]. The roles of such factors need to be further investigated.

Abnormal daytime frequency (more than 8 times per day) was found in 9.6% of our studied population. This has been reported as 7-57.1% in other studies[5,12-15]. However, precaution should be taken reporting such values as there has been no information on the daily liquid intake and also drug usage history neither in our study nor in other epidemiological studies[1,5].

The frequency and means bother scores of SUI was higher than UUI in our study which is in line with previous reports[1,5,7,9,16].On the other hand, in Van Breda HM et al. report, the frequencies of SUI and UUI were as 3.1% and 3.8%, respectively[7].This disagreement can be related to the difference in the mean age of the participants.

21.69% of our participants showed OAB from whom 54.1% had UUI. The prevalence of this syndrome was reported 18.2% in the study of Safarinejad MR. et al.[17] which was lower compared with our study. This may be explainable by the overall increment observed in the symptoms during 2009 to 2018. The prevalence of this syndrome has been reported in the range of 2% to 53% in various studies[18-21].

In present study, nocturia comprised the second most common symptom after urgency. Also, nocturia claimed the highest bother score after urgency and SUI. In their study, Hajebrahimi S. et al. reported nocturia (at least one per night) as the most common symptom (43.5%) among women with the mean age of 21.11 years[23]. Some studies have suggested nocturia of one time per night as a normal phenomenon[5,7]. These implications suggest the one night-time nocturia as a normal phenomenon rather than a disorder. This hypothesis may be further supported by the relatively low mean bother score of 1.6 in individuals with this problem. Nonetheless, by using the modified definition of nocturia, the storage symptoms still retained higher frequencies than voiding symptoms.

Irwin DE. et al. asserted an increasing trend in LUTS[4]. These researchers reported at least one LUTS symptom in 45.2% of subjects older than 20 years old in 2008. They further predicted an increasing ratio of 18.4% of LUTS symptoms to reach 63.6% in 2018.

These ratios were obtained 95.5% and 94.3% in the present report and the study of Van Breda et al[7] respectively indicating a close proximity despite different age spectrums of the participants.

A history of visiting urologists within the past three months was recorded in 11.1% of our participants. Regarding cultural dissimilarities among societies, this ratios have been variable in different countries with reported values of 22% in Brazil[23] and 4% in China[24]. Among Muslims, some of factors deterring physician appointments are shame, religious issues (excrements avoidance), and considering incontinence as a normal sequela of aging[25].

A history of seeking physician due to urinary tract infections within the past six months was noted in 12.1%. Respective to the overall value, these individuals showed higher rates of UUI, urgency and daytime frequency. Nevertheless, in our study, the diagnosis of the infections was decided based on the patients' claims rather than the paraclinical finding which is a limitation of the study.

At least one symptom of LUTS was identified in 95.5% of our studied population. However, 88.9% of these individuals stated no complaints and did not visit physicians. This brought up the question that when a lower urinary tract symptom should be considered as a complaint? And why the majority of people did not seek medical assistance for their problems? Do they regard these symptoms as normal? The epidemic nature of the

symptoms, the lack of knowledge, unwillingness, and shame may largely contribute to this phenomenon. A symptom being considered as intolerable is mainly dependent on the level of agony and reduction in life quality. It is probable that the most of women assessed in present study suffered from hidden symptoms. The essential factor is individual's attitude toward these symptoms. Without any doubt, these symptoms are often resulted from functional disorders rather than pathologies like infections or urinary system tumors. Limitations of this study include the cross-sectional design, and not considering the relationship of incontinence with other associated diseases, time-dependent alternations in the symptoms, and the possible impacts of dietary habits. These may be addressed in future studies.

CONCLUSIONS

According to the ICS definitions, our results demonstrated that LUTS were highly prevalent but had relatively low bother score. This may indicate hidden or silent LUTS in adult women in Isfahan. Nevertheless, the most frequent symptom was urgency.

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CONFLICT ON INTEREST

The authors report no conflict of interest.

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Supplementary Table:
Bother score (mean, median and IQRα) in each symptom according to analog scale

Symptoms	Bother score (mean)	median (IQR)
Nocturia	1.55	0 (0-2)
Urgency	2.45	1 (0-4)
Pain	1.47	0 (0-2)
Daytime frequency	1.69	0 (0-2)
Hesitancy	0.86	0 (0-0)
Straining	0.70	0 (0-0)
Intermittency	1.05	0 (0-1)
Urgency incontinence	1.53	0 (0-2)
Stress incontinence	1.84	0 (0-2)
Unexplained incontinency	0.72	0 (0-0)
Nocturnal enuresis	0.37	0 (0-0)

α=interquartile range