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Predictors of urogenital distress and impaired quality of life in adult Egyptians with lower urinary tract symptoms

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Abstract

Background: This study aims to assess the severity of lower urinary tract symptoms, and to assess predictors of impaired quality of life among Egyptian adults complain of lower urinary tract symptoms.

Methods: An observational cross-sectional research was done using an online anonymous poll survey. The survey was implemented through sharing on different social media applications. The survey was posted from June 1, 2020, to June 10, 2020. The overall communities of the Egyptian adults who satisfied the incorporation rules and consented to take an interest in the research were incorporated using convenience and snowball collecting methods (188 adults). A semi-structured questionnaire on socio-demographic characteristics and Arabic Urogenital Distress Inventory (UDI-6) and Incontinence Impact Questionnaire (IIQ-7) short forms were used.

Results: Approximately 220 Egyptian adults shared in the research but only 188 fulfilled inclusion and exclusion criteria. Approximately 92% of them had at least one symptom of lower urinary tract manifestations. Irritative symptoms presented in 65 (85.5%) of males and 102 (91.1%) of females. Stress symptoms presented in 44 (57.9%) of males and 63 (56.2%) of females with higher statistically significant mean of stress symptoms. Obstruction/discomfort symptoms presented in 51 (67.1%) of males, and 77 (68.8%) of females. Seeking help and duration of the urological problem were statistically significant independent positive predictors of UDI-6-total. The Irritative score, obstruction/discomfort score, and duration of the urological problem were statistically significant independent positive predictors of IIQ-7-total.

Conclusions: Urological problems are common and have an impact on the quality of life in various domains of physical activity, social relationships, travel, and emotional health.

Keywords: Lower urinary tract symptoms, Overactive bladder, Quality of life, Urinary incontinence

1 Background

Lower urinary tract symptoms (LUTS) are a common health problem. International Continence Society (ICS) arranges LUTS manifestations into three groups: storage, voiding, and post-micturition [1]. International reviews have assessed that LUTS influence at least 60% of adults. Previous reports have demonstrated that voiding

symptoms are more common in men than ladies, and storage symptoms are more common in ladies than men [2, 3].

Lower urinary tract symptoms (LUTS) are highly prevalent in Egypt 86% suffered from LUTS in a previous study, 30% have overactive bladder, and 21% experienced urinary incontinence (UI) [4].

The effect of LUTS on the everyday activity of patients can be significant with distress and reduced confidence [5, 6]. Impaired quality of life has been found among

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individuals with LUTS, especially depression and anxiety [7, 8].

Therefore, this research plans to explore the severity of symptoms of the lower urinary tract and to assess predictors of impaired quality of life among Egyptian adults complaining of these symptoms, to improve patient's awareness for the importance of seeking medical advice without shy, and improve their quality of life.

2 Methods

2.1 Study design and population
This research is an observational cross-sectional study to investigate the impact of symptoms affecting lower urinary tract on quality of life and to evaluate predictors of impaired quality of life by using an online anonymous poll survey. The review led through sharing on different social media applications. It started from June 1, 2020, to June 10, 2020. The Egyptian adults who satisfied the incorporation rules and consented to take an interest in the research were incorporated using convenience and snowball collecting methods (188 adults). A semi-structured questionnaire included socio-demographic characteristics and Arabic Urogenital Distress Inventory (UDI-6) and Incontinence Impact Questionnaire (IIQ-7) short forms.

2.2 Inclusion and exclusion criteria
Egyptians of both sexes aged 18 years or more, able to understand and read Arabic, who use social media, and willing to give informed consent were included. While pregnant, those with symptomatic urinary tract infections, neurologic diseases (except diabetic neuropathy), active malignant tumors, dementia, and mental retardation, or refused to share in the study were excluded.

2.3 Sampling
It was planned to take a sample sufficient to demonstrate a 86% prevalence of one or more LUTS among Egyptians in a previous study [4]. The sample size was calculated using the prevalence formula where $Z_{\alpha/2} = 1.96$ (The critical value that divides the central 95% of the Z distribution from the 5% in the tail), and $E =$ Margin of error $= 5\%$. So, by calculation, the sample size is equal to 185 participants. Then consecutive convenience sample was included to fulfill the sample size and extended to 188 participants (Fig. 1).

2.4 Study tools
A semi-structured questionnaire consisted of two parts:

(1) Socio-demographic characteristics and history

It included age, gender, residence, level of education, employment status, marital status, income, smoking, drinking caffeine beverages, presence of any chronic diseases, number of deliveries, previous surgeries, seeking help, and duration of LUTS.

(2) Urogenital Distress Inventory (UDI-6) and Incontinence Impact Questionnaire (IIQ-7) short forms

The UDI-6 is a valid and reliable six points survey, used particularly to investigate symptoms associated with lower urinary tract dysfunction and inquire on irritative, stress, and obstructive/discomfort complaints. UDI-6 made from three subscales: (1) irritation (urgency, frequency, and pain), (2) stress, and (3) obstruction/discomfort or symptoms of voiding difficulty. The IIQ-7 is a seven point's questionnaire specific to UI to impact the

Fig. 1 Study flowchart

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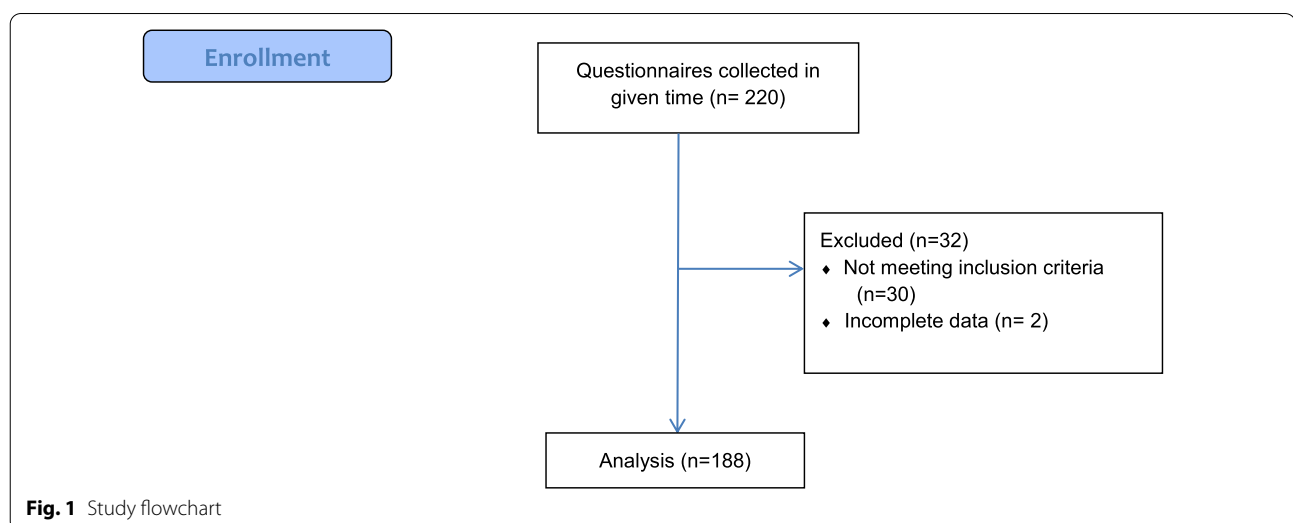
quality of life and contains many questions: one and two assess physical activity; three and four assess travel; five assess social/relationships, while six and seven assess emotional health [9].

Both instruments were developed to be self-administered and are intended to be used combined. Validity and reliability of the Arabic short forms of the UDI-6 and IIQ-7 questionnaire were tested and confirmed in an Arab general population, the questionnaire validated using Psychometric validation and reliable as the test–retest reliability and internal consistency on 35 patients for UDI-6 was ICC 0.98 with excellent intra-rater reliability and Cronbach's α was 0.99 (>0.9), confirming an excellent correlation between the different items. For IIQ-7; internal consistency (Cronbach's α 0.99) and test–retest reliability of the IIQ-7 (ICC 0.98) were very good. The κ values for each item ranged from 0.77 to 0.96 for both [10].

2.4.1 Scoring
Patients asked how much they experience the impaired function of UI and the extent to which this UI affects their daily functioning with four response options per item ((0) "not at all"; (1) "slightly"; (2) "moderately"; (3) "greatly"). The mean score of items is multiplied by 33 1/3 to convert to a 0–100 scale. Higher scores indicate more symptom distress (UDI-6), or more impact on daily life (IIQ-7) [9, 10].

The Questionnaire face validity to make it sense to Egyptian patients by three experts panel, then a pilot study was done on 20 patients to assess the visibility and reliability of the questionnaire. Cronbach Alpha reliability coefficient of the questionnaire items was 0.7 indicating acceptable reliability.

2.5 Data collection
Data were collected using an online semi-structured survey form using Google forms with a consent form. The survey link is shared through WhatsApp application, Facebook application, and other social media. The participants were encouraged to share the questionnaire with more people as they could. On clicking the link, individuals are directed to the information about the study and informed consent. After they accept taking the survey, they were able to fulfill demographic information. At that point, a set of several questions showed up sequentially, in which the individuals were able to reply.

2.5.1 Outcome variables
Urogenital symptoms distress and impact of urinary incontinence on quality of life were the outcome variables.

2.6 Statistical analysis
Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS V20.0). The normal distribution of the continuous data was checked using the Shapiro Wilk test. Descriptive statistics normally distributed data were expressed by mean and Standards deviation. Frequencies and percentages are calculated and tabulated. An independent sample t test was used to compare means of UDI and IIQ for age and gender. The correlation was explored between UDI-6 and IIQ-7 total and subs-core through the Pearson test. Multivariable linear regression analysis was used to assess predictors of the UDI-6 and IIQ-7. A P value of <0.05 was considered statistically significant.

2.7 Research ethics
The institutional Ethics Committee approved the study (4183#). Written informed consent was obtained from all participants included in the study. No monetary rewards were given for completing the questionnaire.

3 Results
About 220 Egyptian adults responded to questionnaire but 32 of them were excluded by inclusion and exclusion criteria in 30 of them and missed data in 2 patients, so only 188 of the participants were included in our study analysis, around two-thirds of sample 136 (72.3%) aged from 18 to 39 years, females represented 59.6% of the sample. The mean Body Mass Index was 28.9 (Table 1).

About 83% of the participants reported any degree of increased urinary frequency (from mild to severe). Approximately 77.7% have a sense of urgency. Approximately 41.5% have difficulty in emptying, while 60% have pain or discomfort. Around one-third of the participants' quality of life was affected in various domains (Table 2).

Approximately 92% of the collecting sample had at least one lower urinary tract symptom. Irritative symptoms present in 65 (85.5%) of males and 102 (91.1%) of females. Stress symptoms present in 44 (57.9%) of males and 63 (56.2%) of females with a higher statistically significant mean of stress symptoms. Obstruction/discomfort symptoms were found in 51 (67.1%) males and 77 (68.8%) females. Regarding the impact on the quality of life there is a major impact on females than males in total and sub-scales of IIQ-7 but not statistically significant. Total IIQ-7 affected 64 (57.1%) in females versus 33 (43.4%) in males (Table 3).

There was a significant moderate correlation between UDI-6, and IIQ-7 total and sub-scores. Also, physical, travel, social, and emotional sub-scores show mild to

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Table 1 Socio-demographic and personal characteristics of the sample (*n* = 188)

Variable	Count	%
Age		
18–39 years	136	72.3
≥ 40 years	52	27.7
Gender		
Male	76	40.4
Female	112	59.6
Marital status		
Single/divorced/widow	74	39.4
Married	114	60.6
Education		
≤ Secondary school	25	13.3
High education (Bachelors)	103	54.8
Post-graduate degrees	60	31.9
Work		
Yes	125	66.5
Income		
Sufficient	121	64.4
Residency		
Urban	162	86.2
Rural	26	13.8
History of chronic disease		
Yes	34	18.1
Previous delivery (female)		
Yes	70	38.2
Smoking		
Yes	26	13.8
Caffeine beverages daily		
Yes	139	73.9
Previous abdominal surgery		
Yes	67	35.6
Seek help for urological problem		
Yes	68	36.2
Duration of urological problems		
≤ 5 years	54	28.4
> 5 years	17	9.1
Body Mass Index (mean ± SD)	28.96 ± 6.3	

moderate correlation with UDI- total and sub-scores (Table 4).

Multivariable linear regression analysis to assess predictors of UDI6-total showed that seeking help for urological problems and duration of the urological problem were statistically significant independent positive predictors of UDI-6-total (Table 5).

The irritative score, obstruction/discomfort score, and duration of the urological problem were statistically significant independent positive predictors of IIQ-7-total (Table 6).

4 Discussion

The UDI-6 and IIQ-7 are used worldwide as comprehensive questionnaires for evaluating urogenital dysfunction and lower urinary tract symptoms related to life quality [11].

The study showed that 92.6% of the participants have at least one LUTS; the majority 88.8% had irritative voiding symptoms, while obstruction/discomfort symptoms in 68.1%, and lastly stress symptoms in 56.9%. Mourad et al. [4] mentioned that 86% of their participants experienced ≥ 1 urinary symptom: storage symptoms reported in 75%, then voiding symptoms in 52%, these results congruent with the results of this study and showed that there is a high prevalence of LUTS among adult Egyptians, which needs medical attention.

Other surveys have stated the symptoms of the lower urinary tract (LUTS) in adults aged more than 40 years prevalent as 65% in Europe [3], 74% in North America [2], and 61% in Asia [12]. The irritative voiding symptoms were greater than obstructive symptoms [2, 3].

In this study the irritative voiding symptoms were more common in females than males with no statistical significance difference, the frequencies of three voiding domains were comparable in respondents aged less than 40 and those aged more than or equal to 40 years (*P* > 0.05). UDI-6 total mean score was higher in females (*P* > 0.05). UDI-6 Irritative domain score mean was higher in men (*P* > 0.05), but the UDI-6 Stress domain score mean was higher in females than in males with statistical significance difference (*P* < 0.05).

Many reports detailed voiding symptoms are more common in men, while storage symptoms commoner in females [2, 3, 12].

In agreement with our study, a study showed that the prevalence of LUTS was approximately 75% in adults; adult females were affected more than men (82% vs. 69%) did. Storage symptoms: frequency and nocturia were the most prevalent in both sexes. Irritative voiding symptoms were higher in women, while obstructive symptoms were more common in men [13].

Another study reported that both genders have a similar prevalence of LUTS through fifty years of life. The difference in voiding and storage symptoms between males and females was in the range of 10% and decreased to 5% in older age. Storage symptoms were most predominant in younger females compared to age-matched men. In contrast, voiding symptoms are greater in aged males [14]. These studies supported our finding that irritative voiding symptoms are the predominant LUTS symptoms among adults, especially in women.

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Table 2 Urinary Distress Inventory (UDI-6) and Incontinence Impact Questionnaire (IIQ-7) responses of the study sample (*n* = 188)

Variables	No	Little	Moderate	Very much
UDI-6				
1. Need for urinary frequency	32 (17.0)	69 (36.7)	55 (29.3)	32 (17.0)
2. Sense of urgency	42 (22.3)	60 (31.9)	49 (26.1)	37 (19.7)
3. Leakage with activity	113 (60.1)	45 (23.9)	17 (9.0)	13 (6.9)
4. Leakage in small amounts	103 (54.8)	50 (26.6)	23 (12.2)	12 (6.4)
5. Difficulty emptying	110 (58.5)	50 (26.6)	20 (10.6)	8 (4.3)
6. Pain or discomfort	75 (39.9)	71 (37.8)	24 (12.8)	18 (9.6)
IIQ-7				
1. Ability to do household chores	139 (73.9)	30 (16.0)	16 (8.5)	3 (1.6)
2. Ability for physical activity	128 (68.1)	45 (23.9)	15 (8.0)	0
3. Recreational activities	139 (73.9)	32 (17.0)	15 (8.0)	2 (1.1)
4. Ability to travel	129 (68.6)	33 (17.6)	21 (11.2)	5 (2.7)
5. Participation in social activities	136 (72.3)	31 (16.5)	17 (9.0)	4 (2.1)
6. Emotional health	121 (64.4)	35 (18.6)	23 (12.2)	9 (4.8)
7. Frustration	133 (70.7)	29 (15.4)	14 (7.4)	12 (6.4)

Table 3 Prevalence of lower urinary tract symptoms (LUTs) and its impact on the study sample by age and gender (*n* = 188)

Variable	Male (76) N (%)	Female (112) N (%)	P value	Age < 40 (136) N (%)	Age ≥ 40 (52) N (%)	P value
Any LUTs (UDI-6): *n* (%)	70 (92.1)	104 (92.9)	0.84	126 (92.6)	48 (92.3)	0.94
Mean ± SD	28.8 ± 19.7	33.9 ± 22.9	0.10	31.7 ± 22.6	32.4 ± 19.5	0.82
Irritative symptoms: *n* (%)	65 (85.5)	102 (91.1)	0.24	121 (89)	46 (88.5)	0.92
Mean ± SD−	49.9 ± 31.7	46.9 ± 30.4	0.52	47.0 ± 31.4	51.2 ± 29.6	0.39
Stress symptoms: *n* (%)	44 (57.9)	63 (56.2)	0.82	78 (57.4)	29 (55.8)	0.84
Mean ± SD	13.8 ± 18.1	27.7 ± 30.4	0.000*	21.3 ± 26.3	24.3 ± 28.6	0.51
Obstruction/discomfort: *n* (%)	51 (67.1)	77 (68.8)	0.81	96 (70.6)	32 (61.5)	0.23
Mean ± SD	22.7 ± 25.6	27.2 ± 25.0	0.24	26.8 ± 27.3	21.7 ± 18.8	0.15
Any impact (IIQ-7): *n* (%)	33 (43.4)	64 (57.1)	0.06	65 (48)	32 (61.5)	0.09
Mean ± SD	12.1 ± 17.8	16.4 ± 21.7	0.15	13.5 ± 19.8	17.7 ± 21.3	0.22
Physical activity: *n* (%)	24 (31.6)	44 (39.3)	0.28	44 (32.4)	24 (46.2)	0.08
Mean ± SD	9.6 ± 16.5	15.1 ± 22.5	0.055	11.7 ± 19.7	16.0 ± 22.1	0.23
Travel: *n* (%)	26 (34.2)	43 (38.4)	0.56	48 (35.3)	21 (40.4)	0.52
Mean ± SD	11.6 ± 18.8	15.6 ± 24.6	0.21	13.7 ± 22.9	14.7 ± 21.5	0.78
Social/relationship: *n* (%)	20 (26.3)	32 (28.6)	0.73	34 (25)	18 (34.6)	0.19
Mean ± SD	11.8 ± 22.2	14.8 ± 26.3	0.3	12.5 ± 24.3	16.7 ± 26.0	0.32
Emotional health: *n* (%)	26 (34.2)	45 (40.2)	0.41	46 (33.8)	25 (48.1)	0.07
Mean ± SD	15.3 ± 26.6	19.4 ± 28.6	0.3	15.7 ± 26.9	23.0 ± 29.9	0.13

* Statistically significant ($P < 0.05$)

The prevalence of any impact IIQ-7 was 51.6%, the majority was impacted on Emotional health, while adult females and respondents aged ≥ 40 years had more impact with no statistical significance difference. For respondents aged < 40 years the impact on the Travel domain was the most common 35.3% ($P > 0.05$).

Some studies have documented an effect of LUTS on overall QoL scores, social life interaction, physical activities, and mental health [15–17]. Disturbed mental health, specifically depression and anxiety reported with LUTS regardless of sex or ethnicity [15, 16, 18]. Age-related reports of the effects on quality of life due

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Table 4 Correlations between UDI-6 and IIQ-7 total and sub-scores

Variable	IIQ-7 total score	Physical score	Travel score	Social score	Emotional score
UDI-6 total score					
r	0.479**	0.428**	0.360**	0.346**	0.465**
P value	0.000	0.000	0.000	0.000	0.000
Irritative					
r	0.393**	0.313**	0.326**	0.302**	0.377**
P value	0.000	0.000	0.000	0.000	0.000
Stress					
r	0.337**	0.316**	0.239**	0.282**	0.311**
P value	0.000	0.000	0.001	0.000	0.000
Obstruction/discomfort					
r	0.398**	0.386**	0.278**	0.224**	0.410**
P value	0.000	0.000	0.000	0.002	0.000

**Correlation is significant at the 0.01 level (2-tailed)

Table 5 Best fitting multiple linear regression model for UDI-6 score

	Unstandardized coefficients		Standardized coefficients	t	Sig	95.0% confidence interval for *B*	
	B	Std. error	Beta			Lower bound	Upper bound
(Constant)	10.984	10.102		1.087	0.278	− 8.949–	30.918
Age	− 1.040–	1.550	− 0.051–	− 0.671–	0.503	− 4.098–	2.019
Gender	5.403	3.633	0.122	1.487	0.139	− 1.767–	12.572
Number of deliveries	− 0.766–	1.323	− 0.052–	− 0.579–	0.563	− 3.377–	1.845
BMI	0.218	0.252	0.063	0.868	0.387	− 0.278–	0.715
Caffeine beverage daily	0.214	3.177	0.004	0.067	0.946	− 6.055–	6.483
Seek help	9.959	3.722	0.220	2.676	0.008*	2.615	17.303
Duration	6.790	1.606	0.356	4.227	0.000*	3.620	9.960

Adjusted *r*-square = 0.251

Model ANOVA: $F = 9.931, P = <0.001$

All variables entered

*Statistically significant ($P < 0.05$)

Table 6 Best fitting multiple linear regression model for IIQ-7 score

	Unstandardized coefficients		Standardized coefficients	t	Sig	95.0% confidence interval for *B*	
	B	Std. error	Beta			Lower bound	Upper bound
(Constant)	0.509	2.417		0.211	0.833	− 4.260–	5.278
Irritative score	0.104	0.051	0.158	2.053	0.042*	0.004	0.204
Stress score	0.097	0.054	0.129	1.800	0.073	− 0.009–	0.204
Obstruction/discomfort	0.126	0.063	0.158	2.002	0.047*	0.002	0.251
Duration of urological problems	3.274	1.508	0.184	2.170	0.031*	0.298	6.250
Seek help	3.859	3.536	0.091	1.092	0.276	− 3.117–	10.836

Adjusted *r*-square = 0.257

Model ANOVA: $F = 13.961, P < 0.001$

Total score of UDI entered and excluded

*Statistically significant ($P < 0.05$)

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to symptoms of lower urinary tract illustrated the significance of age for the suffering score, especially the storage symptoms represented in urgency and frequency [17]. These findings strengthen ours that LUTS harms the quality of life.

Multiple regression analysis of predictive factors in this study found that the duration of urological symptoms and seek medical help were positive predictors of UDI-6 total mean score, while UDI—Irritative, UDI-Obstruction domains, and duration of urological problems were the main positive predictors of IIQ-7 total mean score ($P < 0.05$).

UDI-Stress domain had statistical significance correlation to IIQ-7 mean score, and there was a statistical difference between men and women regarding UDI stress domain mean score.

The mean of the total score on the IIQ-7 and UDI-6 was significantly greater in the combined detrusor muscle overactivity with stress urinary incontinence (DOA_USI) and urinary stress incontinence (USI) groups compared with the adult females with no urodynamic symptoms [19]. The results are congruent with the research as the UDI-6 score was found to be predictive for urodynamic diagnoses, especially urinary incontinence and detrusor overactivity and obstruction, but not for the severity of incontinence [20]. Soler et al. [21] demonstrated that in the presence of LUTS less than half the time or more, one-quarter of respondents sought treatment but 6% fewer received treatment.

In contrast to our results, moderate LUTS impacted QoL, and this impact linked to chronic diseases as diabetes, hypertension, and cancer [17]. In our study, there was no correlation with chronic diseases, this could be because of the difference between studied age groups as most of our study were below 40 years old.

Limitations of our study included self-reporting of LUTS by respondents through a web-based survey with a lack of medical evaluation. The majority of respondents were < 40 years. The questionnaire is limited, as not combined by urodynamic studies, and limited to educated people who can read it, all these could lead to a potential selection bias and imprecision, but its strength in detecting sensitive issue as many patients hesitates to discuss urological problems especially urinary incontinence in our culture. The manuscript used short forms of UDI-6 and IIQ-7 to be used as a simple screening tool to assess a sensitive topic to be screened as LUTS especially in women showing the high prevalence of this problem and the low medical seek for help, willing that raising this issue will encourage who needs help to overcome their shy for help.

5 Conclusions

Urological problems are common and have an impact on the quality of life in various domains of physical activity, social relationships, travel, and emotional health. The duration of urological symptoms and seek for medical help were positive predictors of UDI-6 total mean score, while UDI—Irritative, UDI-Obstruction domains, and duration of urological problems were the main positive predictors for IIQ-7 total mean score.

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