

## Quality of Life in Premenopausal Women Suffering from Urinary Incontinence

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### ABSTRACT

**Background:** Women of all ages and races are affected by the widespread clinical disorder known as urinary incontinence (UI). In premenopausal women, urinary incontinence whatever its type, had a negative effect on the quality of life (QoL). **Objective:** The aim of the current study was to assess various forms of urine incontinence in premenopausal women and alterations in QoL for these women. **Patients and methods:** A cross-sectional study was carried out at Suez Canal University Hospital's Gynecological Outpatient Clinic. A total of 345 premenopausal women complaining of urinary incontinence were recruited from June 2020 to July 2022. QoL was evaluated by an Arabic validated form of the Urogenital Distress Inventory and adapted incontinence impact questionnaires short forms IIQ-7 and UDI-6. **Results:** In the UDI-6, the irritative QoL domain was severely affected (44.32%) more than the stress domain (5.51%) ( $P < 0.001$ ) and with the obstructive domain (19.72%) ( $P < 0.001$ ). In IIQ-7, the travel domain was severely affected (27.53%) more than other four domains ( $P < 0.001$ ). No statistically significant association was present between UI type and the grade of QoL domain affected ( $P > 0.05$ ) except in the social domain ( $P < 0.001$ ) and in the travel domain ( $P = 0.003$ ). **Conclusion:** Although no statistically significant association between different subtypes of UI in premenopausal women, UI whatever its type, had a bad impact on QOL.

**Keywords:** Urinary incontinence, Premenopausal women, Urogenital distress inventory, Cross sectional study, Suez Canal University.

### INTRODUCTION

Urinary incontinence (UI) is the complaint of unintentional urine loss, and there are three main subtypes of UI recognized by the International Continence Society (ICS): urgency a sudden, intense urge to urinate is known as UI (UUI), which is defined as the involuntary loss of urine from the bladder when a sudden strong need to urinate is felt., stress UI (SUI) which is defined as involuntary loss of urine in response to conditions associated with increased intraabdominal pressure such as laughing or coughing, and mixed UI (MUI) defined as the complaint of involuntary leakage of urine associated with urgency and also with exertion, coughing, sneezing, or effort <sup>(1)</sup>. Stress urinary incontinence and urge urinary incontinence are the most prevalent kinds of urine incontinence in women <sup>(2)</sup>. The prevalence of urinary incontinence varies between 26-61%, Additionally, age and obesity cause it to rise; these two conditions may be linked to the climacteric stage, when ovarian function declines and plasma levels of sex hormones decline <sup>(2,3)</sup>. Estrogen receptors in the pelvic floor muscles, urogenital ligaments, fascia, and connective tissues support the genitourinary tract, highlighting the significance of estrogen action on these structures <sup>(4)</sup>. Recent data suggest that up to 45% of middle-aged women had UI bouts a few times every month, while 15% mentioned this issue nearly every day <sup>(4)</sup>.

Women's urinary incontinence (UI) is a serious health issue that significantly lowers their quality of life (QoL) <sup>(5)</sup>. UI is linked to higher rates of morbidity and mortality and can have a negative impact on one's physical, emotional, and social wellbeing; however, the

incontinence type might play a vital role in determining the QoL effects <sup>(6)</sup>. In the majority of research, urge UI (UUI) served as a predictor of the poorest QoL decline <sup>(7)</sup>. Even when mixed urine incontinence (MUI) was taken into consideration, it was shown that the urge component significantly impacted quality of life (QoL) <sup>(8)</sup>. The second worldwide consultation on incontinence created and recommended both the urogenital distress inventory (UDI) and the incontinence impact questionnaire (IIQ) (These instruments are composed of 30 and 19 questions, respectively) to determine how urine incontinence affects quality of life <sup>(9)</sup>. Due to the lengthy amount of time needed to complete the long form, 7 and 6 question versions of the IIQ and UDI were created. As lengthy forms, it has been demonstrated to correctly predict the UDI and IIQ <sup>(10)</sup>. Physical exercise, interpersonal relationships, travel, and emotional health are the four areas covered by the seven items of the initial IIQ-7. The original IIQ-7 had to have several components added, changed, and removed in order to be the seven items of the initial IIQ-7. The original IIQ-7 had to have several components added, changed, and removed in order to adapt it to the Arab culture through one-on-one patient interviews and focus groups.

The original questionnaire was updated by El-Azab *et al.* <sup>(10)</sup> by removing the question about entertainment activities that were inappropriate for Egyptian culture. Additionally, it was crucial to include a question concerning prayer in order to determine the QoL in Arabic Muslim women and numerous Egyptian Christians ladies, who stated that their UI was significantly influencing their church services. The social activity-questioning item was adjusted to fit

Egyptian culture. All Arabic-speaking cultures may easily understand the translations into Arabic of the UDI-6 and modified IIQ-7 surveys, making them both suitable for use with all Arabic populations.

Millions of people are considered to be affected by the widespread issue of urinary incontinence .and is relatively common in Egypt. It is more prevalent when compared to other reports. Also, It had a detrimental effect on different aspects of the patients' lives. Thus, the current study was designed to evaluate how UI affects one's QoL in premenopausal women suffering from UI in Suez Canal University Hospital. Ismailia city, Egypt using Arabic validated form of UDI-6 and the IIQ-7.

## PATIENTS AND METHODS

**Study design:** Cross-sectional study.

**Setting:** The study was conducted at Gynecological Outpatient Clinics in Suez Canal University Hospitals, Egypt. The target population consisted of 345 premenopausal women complaining of UI who were selected from the Gynecological Outpatient Clinic from June 2020 to July 2022.

**Eligibility criteria:** Age is between 40 and 50 years old.

**Inclusion criteria** were premenopausal women who had any type of UI.

**Exclusion criteria** were investigated by history and examinations for psychiatric disorders, neurological findings, and precipitating factors for UI (e.g., chronic cough, abdominal mass, or pelvic mass).

**Sample size calculation:** Calculating the smallest sample size based on a study to establish Austria's prevalence of UI and how it affects people's QoL <sup>(11)</sup>.

**Temml et al.** <sup>(12)</sup> reported that 65.7% of women claimed to have UI has a negative impact on their QoL. Based on their study, and assuming that 5000 women with UI seek help at Gynecological Outpatient Clinic in Suez Canal University Hospital per year, a minimum sample size of 324 women is a needed sample for a prevalence study with a minimum duration of study of 12 months, as statistically significant 95% confidence interval, 0.05 acceptable alpha error, and 95% significance level (5% absolute precision) <sup>(13,14)</sup>. To prevent attrition bias, the sample size per group does not need to be increased <sup>(15)</sup>. The sample size was calculated consistently with **Charan and Biswas** <sup>(16)</sup>.

**Sampling technique:** Convenience sampling was used to collect research subjects, based on the criteria for inclusion and exclusion, till fulfilling the sample size.

**Data collection was conducted utilizing 3 tools:**

**Tool (1):** Structured interviewing schedule composed of four parts:

**Part I** included demographic data such as personal data such as name, age, job, address, and marital status.

**Part II** included obstetrical history, including personal data as parity, mode of delivery and menstrual, and history of obstetric and gynecological operation.

**Part III** included history of any abdominal operation and history of chronic illness.

**Part IV** included premenopausal women's complaints regarding involuntary loss of urine and its onset, course, duration, and relation to cough or strain or urgent need of micturition.

**Tool (2):** Urogenital distress inventory validated form in Arabic and adapted incontinence impact questionnaires short forms IIQ-7 and UDI-6 for evaluation of QoL. The following subscales were developed for the IIQ-7: Prayer (item 1), physical activity (items 3 subscales: The first measured irritability (Q1 and 2), the second measured stress (Q3 and 4), and the third measured obstructive/discomfort (Q5 and 6).

**Items included in the Urogenital Distress Inventory Short Form (UDI-6):**

If the premenopausal woman had any of the following symptoms, how bothersome were they to her by: 1) Frequent urination. 2) Leakage related to the feeling of urgency. 3) Leakage related to activity, coughing, or sneezing. 4) Small amounts of leakage (drops). 5) Difficulty emptying the bladder. 6) Pain or uneasiness in the lower abdominal or genital area. If 4 or more of the 6 questions on UDI-6 and 5 or more of the 7 questions on IIQ-7 were honestly answered, a total score was given. Item responses were assigned values of (0) for not at all, (1) for slightly, (2) for moderately, and (3) for greatly. The mean value of all answered items was obtained and then multiplied by 33 1/3 for the scale score from 0 to 100, and the greater the score, the greater the distress <sup>(10)</sup>.

**Tool (3):** The different types of UI were determined according to the following: Premenopausal women were subjected to complete physical examination including vital signs, general, chest, abdominal, and neurological examinations to exclude any precipitating factors for UI. The local gynecological assessment was done to assess the presence of prolapse; a stress cough test was done to establish the presence of UI. Also, complications of urinary leakage, such as vulvitis and vaginitis, were assessed. A pad test was done if the diagnosis was not sure. Midstream urinalysis and culture were done routinely for all patients in the study, and management was completed for such premenopausal women prior to entering the study.

SUI was associated with normal filling capacity and when the detrusor muscle isn't contracting and intra-abdominal pressure has increased, pee leaks. Also, urodynamic evaluation was done for all the premenopausal women; it was performed to detect the presence of involuntary detrusor contractions, which give the diagnosis of UUI. The coincidence of both raises the diagnosis of mixed urinary incontinence <sup>(17)</sup>.

**Procedures:**

I. Interviewing phase: At the gynecological outpatient clinic a written approval was obtained, and Data were gathered utilizing the created tools, through a face-to-

face interview in a private room to minimize distraction and enhance privacy.

II. Assessment phase: After estimation the type of UI (stress, mixed, or urge), IIQ-7 and UDI-6 were used to evaluate QoL.

**Ethical Approval:** This study was ethically approved by the Institutional Review Board of the Faculty of Medicine, Suez Canal University (1 June 2020 with Research Number 4191). Written informed consent was obtained from all participants. This study was executed according to the code of ethics of the World Medical Association (Declaration of Helsinki) for studies on humans, and items of the STROBE statement.

**Statistical Analysis:** The collected data were introduced and statistically analyzed by utilizing the Statistical Package for Social Sciences (SPSS) version 21 for windows. Depending on the situation, data were input as numerical or categorical. Quantitative data were tested for normality by Kolmogorov-Smirnov test <sup>(18)</sup>. Normal distribution of variables was described as mean, standard deviation (SD), minimum and maximum. Qualitative data were defined as numbers and percentages. More than two independent, normally distributed comparisons were made using a one-way analysis of variance (ANOVA) test <sup>(19)</sup>. Post-hoc multiple comparisons were made using the Games-Howell method <sup>(20)</sup>. To examine the relationship between qualitative variables, the Chi-square test was applied. When indicated (N x M table and >25% of predicted cells were <5) Monte Carlo corrections were made <sup>(21)</sup>. Post-hoc analysis for contingency tables was carried out when the Chi-Square test was significant using the standardized residuals method <sup>(22)</sup>. Correction for P-value for post-hoc Chi-Square analysis was carried out using the Bonferroni method. P value ≤0.05 was considered to be statistically significant <sup>(23)</sup>.

**RESULTS:** Table 1 summarizes the sociodemographic characteristics of studied women. Of the study participants, 49.86% had certain habits as consuming coffee, tea, and cigarette smoking.

**Table 1:** Sociodemographic details of the study's 345 participants.

Characteristics		N	%
Age (years)	40-45	149	43.18%
	45-50	196	56.82%
	Mean ± SD (46.2 ± 4)		
Special Habits	Yes	172	49.86%
	No	173	50.14%
Marital status	Married	265	76.81%
	Divorced	39	11.3%
	Widow	28	8.12%
	Unmarried	13	3.77%
Education	Educated	276	80%
	Illiterate	69	20%
Occupation	Working	128	37.1%
	Not working	217	62.9%

On studying causative factors of developing UI in the study population, we found that 75.62% were delivered vaginally, CS delivered 12.23%, and 12.23% had both types of deliveries. About 36.81% had pelvic operations before developing UI. 51% had constipation. 46.67% had diabetes mellitus, hypertension, and chronic heart disease. The mean BMI was 29.81, as 43.74% were overweight while 38.26% were obese.

About 46.7% of the women had mixed UI, 31.32% had SUI, and 22% had UUI.

According to the intensity of the affection, the following UDI-6 subscales were affected when examining how UI affected various QoL domains: 44.32% of the patients were severely affected in the irritative subscale, 38.53% of the patients were moderately affected in the stress subscale. In comparison, the obstructive subscale was the least affected domain, as 38.82% of the patients were slightly affected. Comparing the level of affection of UDI-6 for various forms of UI, there was no statically significant difference between them according to the irritative, stress, and obstructive subscales (Table 2). Z test for severe affection in stress vs stress obstructive was significant (Z test 5.6196, P<0.001).

Also, the following subscales of the IIQ-7 were affected 44.32% of the women were moderately affected in the prayer subscale, slight to moderate affection in 37.72% of the women in the physical activity subscale, and 40% were moderately affected in the social subscale. The travel and emotional subscales were the least affected domains as 44.92% were slightly affected, and 52.52% showed no affection, respectively (Table 3). Z test for severe affection in travel domain vs all other domains was significant (P<0.001), other pairwise comparisons were not statistically significant (P>0.05). On comparing the different types of urinary incontinence in this study (mixed, urge, stress) according to IIQ-7, there was a statistically significant difference in the social domain (P=0.001) and emotional domain (P=0.003) while other domains showed no statically significant difference (Table 3).

Additionally, there was no statistically significant difference (P=0.941) in the UDI-6's overall score between the various UI types (Table 4). Between the various styles of UI, there was a statistically significant variation in the IIQ-7's overall score (P=0.006) (Table 4). In the UDI-6, the irritative QOL domain was statistically significantly severely affected (44.32%) more when compared with the stress domain (5.51%) (P<0.001) and with the obstructive domain (19.72%) (P<0.001). In IIQ-7, the travel domain was statistically significantly severely affected (27.53%) more when compared to the other 4 domains. There was no statistically significant association between UI type and the grade of QOL domain affected (P>0.05) except in the social domain (P<0.001) and in the travel domain (P=0.003).

**Table 2:** Comparison between different types of urinary incontinence according to severity of affection of UDI-6 (n= 345).

QOL domains		Incontinence Type				X <sup>2</sup>	P-value (Monte-Carlo)	Total incontinence	
		Mixed		Urge				Stress	
		N	%	N	%	N	%		
Irritative	Not at all	161 (46.4%)	76 (22.2%)	108 (31.3%)	1.55	0.954	57 (16.5%)	153 (44.35%)	
	Slightly	26 (16.1%)	12 (15.8%)	19 (17.6%)					
	Moderate	29 (18.0%)	15 (19.7%)	15 (13.9%)					
	Severe	35 (21.7%)	15 (19.7%)	26 (24.1%)					
		<i>P</i> = 0.938	<i>P</i> =0.980	<i>P</i> =0.930					
Stress	Not at all	52 (32.3%)	24 (31.6%)	38 (35.2%)	2.61	0.851	114 (33%)		
	Slightly	40 (24.8%)	20 (26.3%)	19 (17.6%)			79 (22.9%)		
	Moderate	60 (37.3%)	28 (36.8%)	45 (41.7%)			133 (38.5%)		
	Severe	9 (5.6%)	4 (5.3%)	6 (5.6%)			19 (5.5%)		
		<i>P</i> =0.915	<i>P</i> =0.978	<i>P</i> =0.949					
Obstructive	Not at all	6 (3.7%)	2 (2.6%)	3 (2.8%)	1.54	0.957	11 (3.2%)		
	Slightly	62 (38.5%)	33 (43.4%)	39 (36.1%)			134 (38.8%)		
	Moderate	60 (37.3%)	27 (35.5%)	45 (41.7%)			132 (38.3%)		
	Severe	33 (20.5%)	14 (18.4%)	21 (19.4%)			68 (19.7%)		
		<i>P</i> =0.749	<i>P</i> =0.933	<i>P</i> =0.730					

**Table 3:** Comparison between different types of urinary incontinence, according to severity of affection of IIQ-7 (n= 345).

QoL domains		Incontinence Type				X <sup>2</sup>	P-value Monte Carlo	Total			
		Mixed		Urge				Stress		N	%
		N	%	N	%			N	%		
Prayer	Not at all	161 (46.4%)	76 (22.2%)	108 (31.3%)	0.700	0.994	19 (5.5)				
	Slightly	8 (5%)	5 (6.6%)	6 (5.6%)			135 (39.1%)				
	Moderate	64 (39.8%)	31 (40.8%)	40 (37%)			153 (44.3%)				
	Severe	72 (44.7%)	32 (42.1%)	49 (45.4%)			38 (11%)				
		<i>P</i> =0.877	<i>P</i> =0.681	<i>P</i> =0.800							
Physical activity	Not at all	20 (12.4%)	9 (11.8%)	13 (12%)	0.774	0.994	42 (12.2%)				
	Slightly	60 (37.3%)	28 (36.8%)	42 (38.9%)			130 (37.7%)				
	Moderate	59 (36.6%)	31 (40.8%)	40 (37%)			130 (37.7%)				
	Severe	22 (13.7%)	8 (10.5%)	13 (12%)			43 (12.5%)				
		<i>P</i> =0.562	<i>P</i> =0.871	<i>P</i> =0.527							
Social	Not at all	<b>24 (14.9%)</b>	<b>34 (44.7%)</b>	23 (21.3%)	29.5	<b>&lt;0.001*</b>	81 (23.5%)				
	Slightly	39 (24.2%)	17 (22.4%)	23 (21.3%)			79 (22.9)				
	Moderate	<b>76 (47.2%)</b>	<b>16 (21.1%)</b>	46 (42.6%)			138 (40%)				
	Severe	22 (13.7%)	9 (11.8%)	16 (14.8%)			47 (13.6%)				
		<i>P</i> =0.608	<i>P</i> =0.662	<i>P</i> =0.983							
Travel	Not at all	18 (11.2%)	9 (11.8%)	11 (10.2%)	2.680	0.859	38 (11%)				
	Slightly	74 (46%)	37 (48.7%)	44 (40.7%)			155 (44.9%)				
	Moderate	27 (16.8%)	9 (11.8%)	21 (19.4%)			57 (16.5%)				
	Severe	42 (26.1%)	21 (27.6%)	32 (29.6%)			<b>95 (27.5%)</b>				
		<i>P</i> =0.833	<i>P</i> =0.556	<i>P</i> =0.572							
Emotional health	Not at all	<b>75 (16.6%)</b>	<b>53 (69.7%)</b>	53 (49.1%)	20.6	<b>0.003*</b>	<b>181 (52.5%)</b>				
	Slightly	<b>53 (32.9%)</b>	<b>6 (7.9%)</b>	33 (30.6%)			92 (26.7%)				
	Moderate	18 (11.2%)	12 (15.8%)	11 (10.2%)			41 (11.9%)				
	Severe	15 (9.3%)	5 (6.6%)	11 (10.2%)			31 (9%)				

P=0.406      P=0.598      P=0.840

\* Statistically significant

**Table 4:** Comparison between types of urinary incontinence, according to total scores of UDI-6 and IIQ-7.

Total score of QOL Affection	Incontinence			F	P-value
	Mixed N=76	Urge N= 108	Stress N=161		
UDI-6 score	27.11 ± 19.56	27.12 ± 19.59	27.93 ± 20.68	0.061	0.941
IIQ-7 score	45.87 ± 25.38 <sup>a</sup>	24.64 ± 23.23 <sup>b,c</sup>	24.30 ± 21.76 <sup>b,c</sup>	5.21	<b>0.006*</b>

\*Statistically significant.

<sup>a,b,c</sup> Different superscript letters indicate pairwise significant (Post-hoc multiple comparison using Games-Howell method)

## DISCUSSION

Women's lives are negatively impacted by UI in a variety of areas, including their social lives, careers, relationships, and participation in sports <sup>(24)</sup>. In this study, 20.87% (n=72) of the women had UI, 30.43% (n=105) were diagnosed with stress incontinence, and 48.7% (n=168) were diagnosed with mixed incontinence based on urodynamic and clinical assessment. UI in premenopausal women may be explained by greater cognitive impairment and worse cognitive performance linked to UI in older persons <sup>(25)</sup>.

Submucosal thinning, sphincter tonus loss, and a decrease in urethral closure pressure are all related to the decline in estrogen that comes with ageing. The dysfunctions in this intricate UI are intimately tied to these physiological changes <sup>(26)</sup>.

**Alamosa et al.** <sup>(27)</sup> found that 49.4% of the women had SUI, 31.3% had UI, and 24.8% had mixed types of incontinence. According to **Mathur et al.** <sup>(1)</sup>, SUI was identified in 60.44% of women, followed by urge in 23.55% of women, overflow in 5.33% of women, and mixed symptoms in 10.66% of women.

In the present study, we used Arabic-validated forms of the urogenital distress inventory and adapted incontinence impact questionnaires short forms to evaluate premenopausal women with UI's QoL. In this study, the following subscales of the **UDI-6** were affected 44.3% of the women were severely affected in the irritative subscale, 38.6% of the women were moderately affected in the stress subscale, while the obstructive subscale was the least affected domain with 38.8% of the women were slightly affected. MUI and UI were very unpredictable, whereas SUI was typically predicted and occurred with elevated intra-abdominal pressure. This may help to explain symptoms. Additionally, there may be parallel neuropharmacological routes between the sensations of anxiety and urgency <sup>(28)</sup>.

On comparing the different types of UI in this study (mixed, urge, stress), irritative, stress, and obstructive subscales did not statically differ (P values 0.956, 0.855, and 0.957, respectively). Also, there was

no statically significant difference in the total score of the UDI-6 between the different types of UI (P=0.941), which was comparable to the research conducted by **Asoglu et al.** <sup>(29)</sup> as they found that between the three groups, there was no discernible difference in the UDI-6 scores (P=0.845). However, in contrast to this study, a study concluded that SI more negatively affects quality of life than urge incontinence (79% and 44%, respectively). This is probably because more women who complain of stress incontinence receive treatment from the medical system <sup>(8)</sup>. Another study discovered that, compared to women with SI, in terms of health, women who experienced both UI and MUI had a lower QoL <sup>(30)</sup>. Also, a cross-sectional study in the Metropolitan City of Naples by **Corrado et al.** <sup>(31)</sup> symptoms that were moderate in severity (mean 17.6 ± 4.36) and a QoL overall score suggesting moderate compromise to QoL (mean 91.24 ± 20.11).

In this study, the following subscales of the IIQ-7 were affected 44.3% of the premenopausal women were moderately affected in the prayer subscale, slight to moderate affection in 37.7% of the women in the physical activity subscale, 40% were moderately affected in the social subscale. The travel and emotional subscales were the least affected domains, as 44.9% were slightly affected, and 52.5% showed no affection, respectively.

On comparing the different types of UI in this study (mixed, urge, stress), there were statically significant differences in the social domain (P=0.001) and emotional domain (P=0.002), while other domains showed no statistically significant differences. Between the various styles of UI, there was a statistically significant variation in the IIQ-7's overall score (P=0.006).

According to the literature, SUI and MUI are linked to symptoms that are more severe, and MUI is the kind of incontinence that most negatively affects QoL. UI comes in second <sup>(32)</sup>. **Mathur et al.** <sup>(1)</sup> did a study on 225 premenopausal women suffering from UI. Physical activity limitation (28.44%), social contact limitation (35.11%), financial load increase (3.55%),

and emotional upset and anguish were observed in the assessment of the impact's overall aspects measured for QOL. According to **Asoglu et al.** (29), the IIQ-7 revealed that patients with MUI had a significantly worse QoL due to incontinence than those with SUI or UII (P values 0.003 and 0.006, respectively). According to **Lim et al.** (33), individuals with MUI scored more anxiously than those who only had SUI.

One of the study limitations is the little studies that have been done that had used the Arabic validated form of incontinence impact questionnaire, the limited number of studies that had evaluated the effect of UI on premenopausal women's QoL, also some sort of difficulty to obtain such sensitive data due to cultural and religious obstacles.

## CONCLUSION

UI, whatever its type, had a negative effect on the QOL in premenopausal women. Although no statistically significant association was present between different subtypes of UI regarding QoL affection, any type of urine leakage negatively influences women's functionality and well-being and has an impact on their social life, employment, self-care, and participation in sports. Also this clinical issue has to be addressed and further researched. More studies are required to determine whether UI is underdiagnosed or undertreated and, if so, to determine the causes of the problem.

**Consent for publication:** Not applicable

**Availability of data and materials:** The datasets used and/or analyzed during the current work will be made available by the corresponding author upon reasonable request. This article includes all the information generated or assessed throughout this study.

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