

# Prevalence and Risk Factors of Urinary Incontinence among Women

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**Abstract:** ***Aim:** To identify prevalence of different types of urinary incontinence and risk factors associated with them. **Study Design:** This was a cross sectional study conducted between March 2021 to March 2022 at outpatient department of Obstetrics and Gynaecology at SMS medical college, Jaipur. 100 women with complaint of leakage of urine were enrolled in study and data was collected as face to face interview with questionnaires. The data is expressed as mean, median, standard deviation. P values are calculated and <0.05 are considered significant. **Results:** Majority of women had stress urinary incontinence (48%) followed by urge and mixed incontinence (30%, 22% respectively). Majority of women were housewives (83.3%). Socioeconomic status, BMI, education status (p value - 0.001, 0.024, 0.004) were found to be significantly associated with urinary incontinence. Age, Duration, High BMI and Higher parity was significantly associated with severity of urinary leakage. History of UTI/ cystitis has been significantly associated with urge incontinence (p value of 0.021) and women with history of constipation have been significantly associated with stress incontinence (p value of 0.01). Medical disorders did not show any significant association in the study. **Conclusion:** Stress urinary incontinence is found to have the highest prevalence. Age, BMI, parity, educational status, occupation and previous infections and surgical history are various risk factors for same.*

**Keywords:** urinary incontinence, risk factors, socio- demographics, QUID score, questionnaire

## 1. Introduction

Urinary incontinence (UI) is a common health condition that can affect women of all ages, with a wide range of severity and symptoms. The International Continence Society (ICS) defines UI as any involuntary loss of urine<sup>1</sup>. The ICS considers incontinence under the paradigm of the Lower Urinary Tract Symptoms (LUTS). While this classification includes disorders of either storage or voiding functions of the urinary tract system, researchers consider UI a multi-factorial storage disorder<sup>1</sup>. There are five main types of UI currently known to exist. The three most common types of UI known to occur in women are stress, urge, and mixed incontinence<sup>2, 3</sup>. Stress incontinence occurs when the muscles and tissues around the urethra do not stay closed properly when there is an increase in abdominal pressure, like coughing or sneezing, leading to urine leakage. This type is more common in obese women, as well as, after either normal or assisted vaginal deliveries. Urge incontinence, also referred to as overactive bladder, happens when there is a sudden urge to urinate, with the possibility of leaking urine on the way to the toilet. Common triggers of this type include unlocking the door when returning home, turning on the water faucet, or even washing hands. Mixed incontinence occurs when women experience symptoms of both stress and urge incontinence<sup>2, 3</sup>. The knowledge about the risk factors of urinary incontinence in this population will help us to take measures to reduce the burden of the condition. Various risk factors for UI have been identified in epidemiological studies, the most common being age<sup>4</sup>, past history of hysterectomy<sup>5, 6, 7</sup> and obstetric events<sup>8</sup>. In most of the studies, the prevalence increases with age. Major risk factors were age and obesity, Obstetric risk factors such as pregnancy, previous caesarean delivery, previous vaginal delivery, parity, post - partum incontinence. Risk

factors less often reported include smoking, menstrual cycle, menopause, physical forces, fluid intake, and constipation, and racial ethnic differences were also identified<sup>5, 6, 7, 8</sup>.

Based on the identified risk factors, health services available, attitude, and need to treat the condition, women seek medical consultation and are treated<sup>9</sup>.

Hence, the study is carried out to estimate the prevalence, the types, and risk factors associated with urinary incontinence among women visiting the obstetrics and gynaecology (OBG) outpatient (OP) in a tertiary health care centre in Jaipur.

## 2. Materials and Methods

After taking permission from ethical committee of SMS Medical College, Jaipur, a hospital based cross sectional study was done in Obstetrics and Gynaecology dept. of SMS Medical College, Jaipur. Women coming with complain of involuntary leakage of urine (urinary incontinence) and are willing to participate in study are included in study and women with involuntary leakage other than urethra, neurological disease, acute UTI and women already taking medical and surgical treatment for UI are excluded from the study. 100 women were taken as sample size using Ajith et al article<sup>10</sup> as reference. Sample size was calculated at 95% confidence level, assuming 52.65% prevalence of stress urinary incontinence among all women suffering from urinary incontinence. Study was conducted from march 2021 to march 2022.

All female patient who came with complain of involuntary loss of urine were enrolled in the study. The purpose of the study was explained to the patient and informed consent will be taken from all them. The type of incontinence was

diagnosed using QUID questionnaire, a validated 6 questionnaire which is used to calculate the stress incontinence score, urge incontinence score, and mixed incontinence score. Sociodemographic characteristics, self-reported history, risk factors, detailed systemic and local examination will be done according to the study Performa. In obstetrical history number of children, age at first delivery, mode of delivery (normal/instrumental delivery), duration of labour and birth weight of the new-born was taken as these factors may be associated with the incidence of urinary incontinence. Risk factors Chronic constipation, chronic cough, any pelvic surgery and h/o/PID etc. all impact on the outcome of urinary incontinence.

Continuous variables were summarized as mean and standard deviation. Nominal/ categorical data were expressed as percentages. Unpaired T test, one-way anova test and Pearson's correlation coefficient were used for

analysis of continuous variables. Fischer exact test and Chi square test were used for nominal/ categorical variables. P value <0.05 was taken as significant.

### 3. Results

Distribution of demographics, obstetric factors, comorbidities, and habits is given in Table 1. The mean age of the study population was 48.38 yrs. with a range of 35–67 years. BMI had a range of 19.8–37.5 with a mean of 27.56. Higher age was also associated with increased severity of leakage, with women complaining of running clothes wet at median age of 57 yrs and p value <0.001, as depicted in table 2. Seventy-two percentage of the study participants were homemakers and 18% were professionals. Mean parity was 3.51. Majority of women had vaginal delivery (89%).

Table 1

Parameters	Type Of Incontinence			p value
	Stress (n = 48)	Urge (n = 30)	Mixed (n = 22)	
Age (Years)	48.10 ± 8.81	49.77 ± 9.31	47.09 ± 6.29	0.658 <sup>1</sup>
<b>Occupation***</b>				0.006 <sup>2</sup>
Housewife	40 (83.3%)	19 (63.3%)	13 (59.1%)	
Nursing	2 (4.2%)	2 (6.7%)	0 (0.0%)	
Teacher	1 (2.1%)	4 (13.3%)	3 (13.6%)	
Farmer / Shop Owner / Shopkeeper	4 (8.3%)	1 (3.3%)	4 (18.2%)	
Tailor	1 (2.1%)	0 (0.0%)	2 (9.1%)	
Sweeper	0 (0.0%)	4 (13.3%)	0 (0.0%)	
<b>Religion</b>				0.725 <sup>3</sup>
Hindu	36 (75.0%)	20 (66.7%)	16 (72.7%)	
Muslim	12 (25.0%)	10 (33.3%)	6 (27.3%)	
<b>Socioeconomic Status***</b>				<0.001 <sup>3</sup>
Upper	8 (16.7%)	12 (40.0%)	8 (36.4%)	
Upper Middle	16 (33.3%)	0 (0.0%)	7 (31.8%)	
Lower Middle	20 (41.7%)	6 (20.0%)	2 (9.1%)	
Upper Lower	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Lower	4 (8.3%)	12 (40.0%)	5 (22.7%)	
<b>Marital Status***</b>				0.001 <sup>2</sup>
Married	45 (93.8%)	21 (70.0%)	22 (100.0%)	
Widow	3 (6.2%)	9 (30.0%)	0 (0.0%)	
<b>Education***</b>				0.004 <sup>3</sup>
Uneducated	13 (27.1%)	10 (33.3%)	6 (27.3%)	
Primary	8 (16.7%)	6 (20.0%)	1 (4.5%)	
Elementary	0 (0.0%)	6 (20.0%)	0 (0.0%)	
Secondary	5 (10.4%)	2 (6.7%)	5 (22.7%)	
Matric	3 (6.2%)	0 (0.0%)	3 (13.6%)	
Graduate	19 (39.6%)	6 (20.0%)	7 (31.8%)	
<b>BMI (Kg/m<sup>2</sup>) ***</b>	29.15 ± 5.30	26.57 ± 4.61	25.46 ± 2.82	0.024 <sup>1</sup>
<b>BMI***</b>				<0.001 <sup>3</sup>
18.5 - 22.9 Kg/m <sup>2</sup>	8 (16.7%)	11 (36.7%)	1 (4.5%)	
23.0 - 24.9 Kg/m <sup>2</sup>	8 (16.7%)	1 (3.3%)	13 (59.1%)	
25.0 - 29.9 Kg/m <sup>2</sup>	8 (16.7%)	6 (20.0%)	8 (36.4%)	
30.0 - 34.9 Kg/m <sup>2</sup>	12 (25.0%)	12 (40.0%)	0 (0.0%)	
35.0 - 39.9 Kg/m <sup>2</sup>	12 (25.0%)	0 (0.0%)	0 (0.0%)	
<b>Duration Of Incontinence (Months) ***</b>	11.42 ± 10.53	33.47 ± 26.05	15.50 ± 12.23	0.001 <sup>1</sup>
<b>Medical History: None (Yes)</b>	28 (58.3%)	17 (56.7%)	14 (63.6%)	0.873 <sup>3</sup>
<b>Medical History: Hypertension (Yes)</b>	9 (18.8%)	1 (3.3%)	4 (18.2%)	0.113 <sup>2</sup>
<b>Medical History: Asthma (Yes)</b>	6 (12.5%)	6 (20.0%)	3 (13.6%)	0.716 <sup>2</sup>
<b>Medical History: COPD (Yes)</b>	0 (0.0%)	1 (3.3%)	1 (4.5%)	0.268 <sup>2</sup>
<b>Medical History: Diabetes (Yes)</b>	4 (8.3%)	5 (16.7%)	0 (0.0%)	0.105 <sup>2</sup>
<b>H/O UTI/Cystitis (Yes) ***</b>	12 (25.0%)	12 (40.0%)	13 (59.1%)	0.021 <sup>3</sup>
<b>Surgical History***</b>				<0.001 <sup>3</sup>
None	32 (66.7%)	12 (40.0%)	14 (63.6%)	

Parameters	Type Of Incontinence			p value
	Stress (n = 48)	Urge (n = 30)	Mixed (n = 22)	
Vaginal Hysterectomy	4 (8.3%)	2 (6.7%)	0 (0.0%)	
<b>Smoking (Yes)</b>	12 (25.0%)	12 (40.0%)	5 (22.7%)	0.279 <sup>3</sup>
<b>Constipation***</b>				0.010 <sup>3</sup>
Not	12 (25.0%)	12 (40.0%)	13 (59.1%)	
Often	24 (50.0%)	6 (20.0%)	5 (22.7%)	
Sometimes	12 (25.0%)	12 (40.0%)	4 (18.2%)	
<b>Parity</b>	3.75 ± 1.18	3.40 ± 1.25	3.14 ± 0.99	0.152 <sup>1</sup>
<b>Mode Of Previous Delivery***</b>				<0.001 <sup>2</sup>
Cesarean	0 (0.0%)	7 (23.3%)	4 (18.2%)	
Operative Vaginal Delivery	4 (8.3%)	0 (0.0%)	0 (0.0%)	
Vaginal	44 (91.7%)	23 (76.7%)	18 (81.8%)	
<b>Place Of Previous Delivery***</b>				0.001 <sup>3</sup>
Hospital	24 (50.0%)	19 (63.3%)	21 (95.5%)	
Home	24 (50.0%)	11 (36.7%)	1 (4.5%)	
<b>Menstrual Status</b>				0.542 <sup>3</sup>
Premenopausal	24 (50.0%)	18 (60.0%)	10 (45.5%)	
Menopausal	24 (50.0%)	12 (40.0%)	12 (54.5%)	
<b>Quid Score: Urge***</b>	0.33 ± 0.48	10.00 ± 2.23	7.91 ± 1.48	<0.001 <sup>1</sup>
<b>Quid Score: Stress***</b>	9.92 ± 2.49	0.00 ± 0.00	8.82 ± 4.18	<0.001 <sup>1</sup>

Stress incontinence accounted for 48%, followed by urge urinary incontinence, contributing 30% and finally, mixed urinary incontinence - 22%, as depicted in Figure 1. Proportion of urinary incontinence in different age groups is depicted in Figure 2.

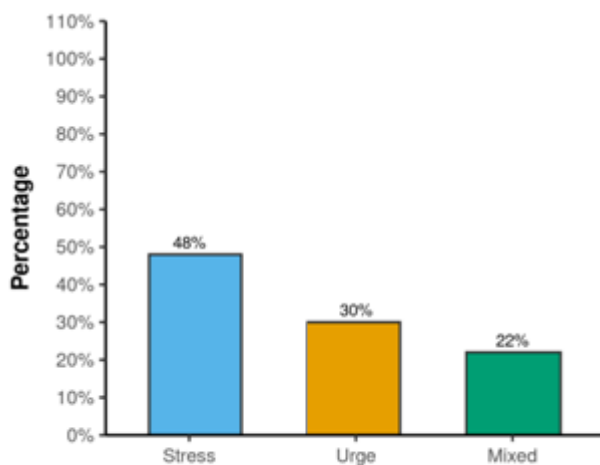


Figure 1

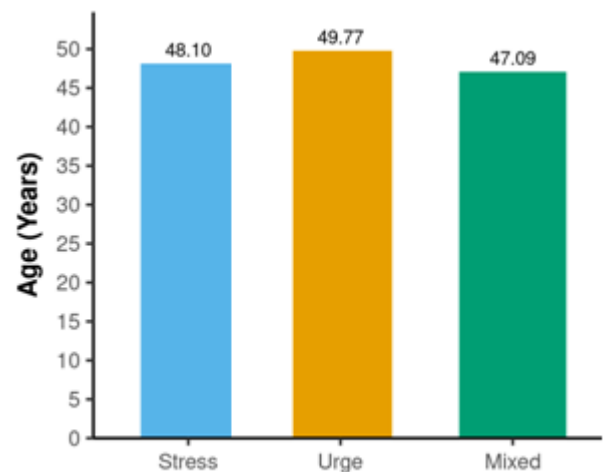


Figure 2

Table 2

Variable	Severity of Leak				Kruskal Wallis Test	
	A Few Drops	Wet Inner Cloth	Wet Outer Cloth	Run Legs And Clothes Wet	χ <sup>2</sup>	p value
Mean (PARITY)	3.35 (1.05)	3.00 (0.69)	3.00 (0.00)	4.60 (1.43)	16.017	0.001
Median (BMI)	24 (22.85 - 30)	23 (19.9 - 24.5)	29.15 (29 - 29.3)	30.3 (29.75 - 35)	27.946	<0.001
MEDIAN (AGE)	46 (42 - 50)	40 (40 - 49.5)	55.5 (46 - 62)	57 (53.75 - 61)	22.839	0.001
DURATION	46 (42 - 50)	40 (40 - 49.5)	55.5 (46 - 62)	57 (53.75 - 61)	21.656	<0.001

It was found that as the duration of symptoms increase, the severity of incontinence also increases. Women with duration of symptoms above 40 months were significantly complaining of their clothes and legs being wet from incontinence (p<0.001). Both upper and lower socioeconomic class has high prevalence of urinary incontinence and difference found was statistically significant (p value <0.001). Majority of women were found to be obese and overweight (80%). There was a significant association of BMI with stress urinary incontinence (p

value= 0.024). Higher BMI was also more significantly associated with severity of urinary leakage, with median BMI highest in the group containing highest severity of leakage i. e run their clothes wet (30.3, pvalue <.001) as shown in table 2. Graduates and uneducated women form majority of study population in view of educational qualification i. e 35% and 29% respectively. Women with medical disorders like asthma, diabetes mellitus, hypertension did not show any significant association in this study (p value 0.716, 0.105 and 0.113 respectively).

As expected high parity was also found to be significantly associated with severity of leakage. Women with high parity complained of running their legs and clothes wet ( $p < 0.001$ ) as shown in table 2. Women with history of UTI/ cystitis has been significantly associated with urge incontinence ( $p$  value of 0.021) and women with history of constipation has been significantly associated with stress incontinence ( $p$  value of 0.01). Among surgical history, vaginal hysterectomy has been found to have highest proportion of women with stress urinary incontinence and also with stress score reflected by QUID.

#### 4. Discussions

In this cross sectional study, majority of women (48%) had stress incontinence followed by urge and mixed incontinence. QUID was used to do the same and researchers like Ajith et al., Altaweel et al., Ramya et al found similarly that stress incontinence is the most prevalent urinary incontinence found<sup>10, 11, 12</sup>. Majority of participants in this study belonged to 41 to 50 yrs of age. In our study we found that stress urinary incontinence is more prevalent in younger age group as compared to urge urinary incontinence which is more prevalent in older age group. Study by Krause also suggests that as age increases, the incidence of stress incontinence decreases and incidence of urge incontinence increases<sup>13</sup>. This may be attributed to the higher level of physical activity seen in younger women and as elderly was probably not as agile as the younger populations, it resulted in a greater prevalence of urge incontinence because they were not able to make it to the bathroom in time. Our study and previous studies by Mallah et al<sup>14</sup> and Aggarwal et al<sup>15</sup> found majority of participants to be housewives. In terms of education status uneducated women as shown by Biswas et al were found to be at more risk for urinary incontinence<sup>16</sup>, in our study graduates also have shown high prevalence of urinary incontinence and this can be explained by the fact that both groups found it tedious to report to hospital as uneducated people often thought UI to be a part and parcel of their lives and other strata couldn't find time to go to hospital for same. Majority (80%) of women were overweight and obese which is similar to studies conducted by Aggarwal et al<sup>15</sup>. Previous studies has found diabetes, asthma to be significantly associated with urinary incontinence as by Ramya Pathiraja et al and Altaweel et al<sup>11, 12</sup>. However this study did not show any association and further studies might be needed. This study show majority of women were multiparous and had vaginal delivery. Labor may act as a direct cause for pelvic floor dysfunction like nerve or muscle damage, direct tissue stretching, and disruption. Biswas et al<sup>16</sup> and this study further support the fact that vaginal hysterectomy and gynaecological procedures were associated with incontinence especially stress. Risk factors like constipation and history of UTI or cystitis had been found to be associated with stress and urge urinary incontinence respectively. Similar findings were observed by Trupti N Bodhare et al and Aggarwal et al<sup>15, 17</sup>.

#### 5. Conclusion

Among types of urinary incontinence, stress urinary incontinence was found to be most prevalent and factors such as age, BMI, parity, constipation, UTI, h/o

gynaecological surgeries like vaginal hysterectomy are found to be significant risk factors. Other risk factors like presence of medical disorders like diabetes mellitus, asthma and COPD can also be attributed.

#### 6. Limitations

As the study is conducted in single tertiary care hospital of Jaipur, sample might not be a true representation of general population.

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