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ASSESSMENT OF PERCENTAGE AND RISK FACTORS OF URINARY INCONTINENCE AMONG SAMPLE OF POST-MENOPAUSAL WOMEN ATTENDING OUT-PATIENT CLINIC OF BAGHDAD MEDICAL CITY. IRAQ 2024

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ABSTRACT

Background: Urinary incontinence is common among postmenopausal women. It is a debilitating condition with impact on physical and psychological aspect of life. **Aim**: determine the percentage, significant association and risk factors of urinary incontinence among sample of postmenopausal women. **Methods**: This cross-sectional study was conducted at Baghdad Teaching Hospital during the period from 1st February to end of July 2024. It included 300 postmenopausal women who were attending the out-patients clinic of this hospital for different pathological causes. A structural questionnaire was used to collect data about the occurrence of incontinence, duration, demographic, clinical and obstetrical characteristics. **Results**: Out of 300 included women, 214 (71.33%) had urinary incontinence. The mean duration of urinary incontinence was 4.20±5.68years. In more than two-thirds (70.56%) of included women, there was a mixed type. However, 12.15% and 17.20% of the women had stress and urge type, respectively. Body mass index was higher in women with urinary incontinence with a significant difference. Early marriage, high number of gravida (>10) and parity (6-10), recurrent urinary tract infection, presence of comorbidities, drugs such as antihypertensive, moderate caffeine intake and hormonal replacement therapy were risk factors. **Conclusions**: The percentage of urinary incontinence among postmenopausal women was more than two- third which is considered high compared with the global prevalence. Mixed type (stress and urge) is the most common type accounting for more than two-third of affected women. This demonstrate the need for health educational strategies to prevent, screen and proper management.

KEYWORDS: Urinary incontinence, stress urinary incontinence, mixed urinary incontinence , postmenopausal women.

INTRODUCTION

Urinary incontinence (UI) is the complaint of involuntary loss (leakage) of urine. The condition occurs in both sexes, but is much more frequent in women. Incontinence in women is typically related to dysfunction of the bladder or pelvic floor muscles, with such dysfunction often arising during pregnancy or childbirth, or at the time of menopause.[1]

The global prevalence rates of UI in women can differ as a result of variations in methods used in studies or reports, women's underreporting of their symptoms, and diagnosis of the condition.[2]

In general, the overall prevalence rate of UI increases with age. Numerous epidemiologic studies showed that the incidence of UI increases with age, with the range of prevalence estimates among community dwelling patients varying enormously from 2% to 58%. Elderly women are the most affected, with a mean prevalence of 34%. The prevalence of UI peaks at 50-54 years of age and may diminish QoL and disrupt daily routines.[3]

The severity of UI has been reported as a risk factor for poor QoL[4] and has a negative effect on many dimensions of QoL, mental health and social activities. Although not life-threatening, UI can certainly prove to be life-changing. In one Austrian study, 65.7% of women stated that their QoL was affected by continence status.[5] In another population-based longitudinal study, UI predicted the onset of psychological distress among community-dwelling adults (≥50 years of age),

especially when associated with condition causing specific functional loss, and this distress can prompt the individual to avoid social or religious gatherings, travel, physical activities and other everyday activities such as shopping.[6] Incontinence symptoms have also been associated with sexual dysfunction[7] and negative effects on marital relationships[8] or partnerships. Women with urgency UI are generally more bothered than those with stress UI, because the leakage is unexpected, sudden and often of large volume. These women show worse scores on QoL and depression scales, poorer quality of sleep, worse sexual function and lower productivity than matched controls.[9]

Urinary incontinence also has negative effects on the psychological burden of family caregivers.[7] Caring for older adults with UI is associated with a significant burden of care and an increase in severity of UI is associated with increased burden of care.[9]

Aim of the study was to determine

1. The percentage
2. Significant association
3. Risk factors of urinary incontinence

Among sample of postmenopausal women attending the out patient clinic of Baghdad teaching hospital.

PATIENTS AND METHODS

A Cross sectional study with analytic elements was conducted in a sample of patients who was attending the out patient clinics (gynecology and internal medicine departments) of Baghdad teaching hospital. The participants attend the hospital from different locations and for different pathological causes.

The study carried out during period from 1st of February 2024 till end of July 2024.

A convenient sample of 300 patients who were attending the outpatient clinics of Baghdad teaching hospital during the period of collecting the data in a rate of 2 visits per week.

Inclusion criteria

Postmenopausal women with no menses for at least one year.

Exclusion criteria

1. Patients who refused to participate
2. Questionnaires not entirely answered.
3. Cognitive functions preserved enough to understand the meaning of the study and to answer questions of the questionnaire through face to face interview.
4. Critically ill patient.

The data was collected by specially designed written structured questionnaire adopted from other international questionnaire by the researcher and modified by a supervisor and specialized community medicine, urological, gynecological and family medicine consultant doctors, (Appendix- A) and translated to the Arabic language by researcher. The researcher collected the data from patients through direct interview for about 15 minutes with each woman.[10,11]

The structured questionnaire consisted of three parts (Appendix-B)adopted from Bradly et al.[11] with modifications was used for assessing UI. It is made up of a total of 8 questions and is divided into two subscales, consisting of 4 for “stress UI,” 4 questions for “urge UI”. Each question was scored on a three-point Likert scale, with answers ranging from "often–2 points” to “never –0 points,” and with scores ranging of 0–16. Furthermore, the duration of UI was also reported.

The first part: sociodemographic features

A. Baseline characteristics

- Number of participants
- Age
- Educational level that classified into illiterate, read and write, primary school, secondary school and university or post graduate.
- Occupation which classified into private, governmental employee, retired or retired.
- Residence which classified into urban and rural.
- Smoking that classified into current smoker, never smoker and former smoker.

C. clinical characteristics include: past medical history and comorbidities such as chronic cough, constipation and recurrent UTI, history of operations, medication history, recurrent urinary tract infection (UTI) and hormonal replacement therapy (HRT), physical activity and family history of UI.

The second part containing 8 questions to assess the type of UI.

The third part include the duration of UI.

A pilot study was conducted in out-patients clinic at Baghdad teaching hospital with 20 patients, which showed:

- The difficulty of understanding the five Likert scale of the scoring system used so changed to 3 Likert scale instead
- The duration of UI is also included.

This group was excluded from the study.

An official agreement document was obtained (appendix-d),

A verbal consent from each participant was obtained prior to data collection after explaining the aim of study. Each patient was given the complete unconditioned choice to withdraw anytime. The confidentiality of data throughout the study was guaranteed and the patients were assured that data will be used for research purpose only.

All of the statistical analyses for this study were performed with the SPSS for Windows software package, version 24.0 (SPSS Inc, Chicago, Illinois, USA). Categorical variables were expressed as counts (percentages) and analyzed with Chi square. Continuous variables were expressed as mean± standard deviation (SD). and analyzed by Student t-test. The limitation of the study include it was done in only one place which was the outpatient clinics of Baghdad teaching hospital.

Short duration of data collection.
There is no confirmatory test used.

RESULTS

The study population (N=300) had a mean age of 57.9 years (SD = 6.6), with the majority aged 56-65 years (46.0%). The average Body Mass Index (BMI) was 31.9 kg/m² (SD = 7.02).

In terms of education, 22.0% of participants were illiterate. Regarding employment, the majority (83.3%) were unemployed.

Most participants resided in urban areas (82.7%). Smoking history showed that 91.3% had never smoked. A family history of urinary incontinence was reported by 35.3% of participants,. Notably, none of the participants reported a history of alcohol consumption. The complete absence of alcohol use could reflect cultural or regional practices.

Table 1: Distribution of participant by baseline characteristics.

Variables	**N=300 (%)**
Age in years	Mean ± SD (57.9 ± 6.6)
44- 55	114 (38.0)
56- 65	138 (46.0)
66 +	48 (16.0)
Body mass index (Kg/M^2)	Mean ± SD (31.9±7.02)
Normal weight	37 (12.3)
Overweight	90 (30.0)
Obese I	67 (22.3)
Obese II	50 (16.7)
Morbid obesity	56 (18.7)
Education levels	
Illiterate	66 (22.0)
Read & write	38 (12.7)
Primary school	106 (35.2)
Secondary school	62 (20.7)
Graduate & Postgraduate	28 (9.4)
Occupation	
Private	24 (8.0)
Employee	6 (2.0)
Unemployed	250 (83.3)
Retired	20 (6.7)
Residence	
Rural	52 (17.3)
Urban	248 (82.7)
History of smoking	
Current smoker	16 (5.3)
Never smoke	274 (91.3)
Formal smoker	10 (3.3)
Family history of urinary incontinence	
Yes	106 (35.3)
No	194 (64.7)
History of alcohol drinker	
Yes	0 (0.0)
No	300 (100.0)

Table 2 shows that the mean age of marriage among participants was 19.4 years. Maternal age at first birth averaged 20.15 years. The mean maternal age at last birth was 34.7 years. Menopause duration averaged 10 years, with 66.7% reporting a duration between 1 and 11 years.

Regarding reproductive history, 55.3% of participants reported 6-10 pregnancies (gravida). Abortion history

was minimal, with 90.7% reporting 0-2 abortions. Stillbirths were uncommon,. Twins were rare, with 94% not reporting any twin births.

Most births were of normal weight, with 62.7% under 4 kg. Vaginal delivery was the most common type, with 68% having normal vaginal deliveries. Hospital deliveries were predominant, with 78% occurring in a hospital setting.

Hypertension and diabetes were the most common comorbid diseases, reported by 55.3% and 36% of participants, respectively. Recurrent urinary tract infections were the most frequent symptom at 46.7%, while 16.7% experienced chronic cough and 19.3% had constipation. Surgical history varied, with 14.7% having undergone a cesarean section, 10.7% a hysterectomy, and 13.3% dilatation and curettage. Regarding physical activity, 58.7% reported light activity levels, and 41.3% moderate, with no participants reporting vigorous physical activity. Most of the patients(88.7%)were lightly caffeine drinker. Finally, hormone replacement therapy was rare, with only 4.7% of participants using it. Among those who did, the duration varied, with 42.8% using it for three months and smaller proportion for longer duration.

Table 2: Distribution of participant based on obstetrical factors, comorbidities, medications and habits with UI.

Variables	**N=300 (%)**
Age of marriage in years Mean ± SD (19.44 ± 6.57)	
9- 20	218 (72.6)
21- 32	68 (22.7)
33- 44	14 (4.7)
Maternal age at 1st birth in years Mean ± SD (20.15 ± 5.07)	
13- 22	237 (79.0)
23- 32	57 (19.0)
33- 42	6 (2.0)
Maternal age at last birth in years Mean ± SD (34.70 ± 5.12)	
17- 25	20 (6.7)
26- 35	152 (50.7)
36- 44	128 (42.7)
Duration of menopause in years Mean ± SD (10.0 ± 7.28)	
11	200 (66.7)
12- 22	78 (26.0)
23- 33	22 (7.3)
Gravida	
< 5	106(35.3)
6-10	166(55.3)
>10	28 (9.3)
Parity	
< 5	134(44.8)
6-10	148(49.3)
>10	18(6.9)
Abortions	
0-2	272 (90.7)
>2	28 (9.3)
Stillbirth	
None	260 (86.7)
One	20 (6.7)
Two	15 (5)
Three	4 (1.3)
Twins	
None	282 (94.0)
One	16 (5.3)
Two	2 (0.7)
Birth weight > 4Kgm	
Yes	112 (37.3)
No	188 (62.7)
History of difficult labor	
Yes	50 (16.7)
No	250 (83.3)

Type of delivery	
Normal vaginal deliveries	204 (68.0)
Assisted vaginal deliveries	12 (4.0)
Cesarean section	84 (28.0)
Place of delivery	
Hospital	234 (78.0)
Home	66 (22.0)
Comorbid diseases*	
Hypertension	166 (55.3)
Diabetes Mellitus	108 (36.0)
Others	46 (15.3)
Signs and symptoms	
Chronic cough	50 (16.7)
Constipation	58 (19.3)
Recurrent urinary tract infection	140 (46.7)
Surgical history*	
Caesarian section	40 (14.7)
Hysterectomy	32 (10.7)
Urinary tract surgeries	8 (2.7)
Dilatation and curettage	40 (13.3)
Pelvic organ prolapses	8 (2.7)
Adnexial surgeries	4 (1.3)
Others	74 (24.7)
Physical activities	
Light	176 (58.7)
Moderate	124 (41.3)
Vigorous	0 (0.0)
Caffeine intake	
light	266 (88.7)
Moderate	34 (11.3)
Drug history	
Diuretics	66 (22.0)
Antihypertensive	150 (50.0)
Sedatives	10 (3.3)
Others*	60 (20.0)
Hormone replacement therapy	14 (4.7)
Hormone replacement therapy duration	n=(14)
2 months	4 (28.6)
3 months	6 (42.8)
6 months	2 (14.3)
10 months	2 (14.3)

*** The patients may have more than one comorbid disease or surgery**

4.3: Distribution of the studied sample according to presence of UI

Figure 3 illustrates the characteristics of urinary incontinence among the study participants (N=300). Among these individuals, the prevalence of urinary incontinence was notable, with 214 participants (71.3%) reporting symptoms, while 86 participants (28.7%) indicated no presence of urinary incontinence. The figure provides an overview of this condition's prevalence in the sample, underscoring a significant proportion affected by urinary incontinence.

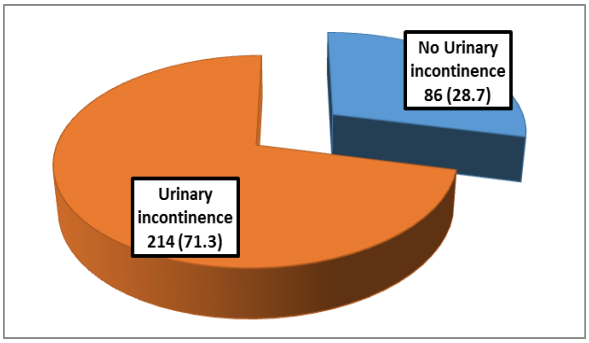

Figure 1: Distribution of the studied sample according to presence of UI.

4.4: Characteristics of Urinary Incontinence among study participants

Among the 300 study participants, 71.3% (214 individuals) reported experiencing urinary incontinence, while 28.7% (86 individuals) did not. Among those with urinary incontinence, the most prevalent type was mixed incontinence, affecting 70.5% of cases (151 individuals). Urge incontinence was present in 17.3% (37 individuals), and stress incontinence was the least common, reported by 12.2% (26 individuals).

The average duration of urinary incontinence was 4.2 years with a standard deviation of 5.7 years.

Table 3: Characteristics of Urinary Incontinence among study participants.

Variables	N=300 (%)
Presence of Urinary Incontinence	
Yes	214 (71.3)
No	86 (28.7)
Type of Urinary Incontinence*	***n= (214)**
Stress	26 (12.2)
Urge	37 (17.3)
Mixed	151 (70.5)
Duration of Urinary Incontinence in years**	****n= (214) Mean ± SD (4.2 ± 5.7)**
1-10	186 (86.9)
11-20	20 (9.3)
21-30	8 (3.8)

4.5: Associated of demographic characteristics with UI

Table 4 analyzes the demographic characteristics related to urinary incontinence in the study population, highlighting significant differences based on age. Among participants aged 44 to 55 years, 71 individuals (33.2%) reported experiencing urinary incontinence, contrasting with only 39 individuals (18.2%) in the 66 and older age group. The observed difference is statistically significant, with a p-value of 0.019, indicating that older age groups are more likely to experience UI.

Furthermore, BMI showed a significant correlation with urinary incontinence, as indicated by a p-value of 0.001. Additionally, educational levels and occupational status were not significantly associated with urinary incontinence.

Furthermore, factors such as residence, smoking history, and physical activity levels did not exhibit significant associations with urinary incontinence, as evidenced by p-values of 0.760, 0.691, and 0.153, respectively.

Although a family history of urinary incontinence indicated a trend toward higher prevalence (61.7% vs. 38.3%), the p-value of 0.088 suggests this finding lacks statistical significance at conventional thresholds.

Table 4: Association of participants by baseline characteristics with UI.

Variables	Urinary Incontinence		P value
	Yes 214 (71.3)	No 86 (28.7)	
			Age in years
44- 55	71 (33.2)	43 (50.0)	**0.019**
56- 65	104 (48.6)	34 (39.5)	
66 +	39 (18.2)	9 (10.5)	
Body mass index (Kg/M^2)			
Normal weight	13 (11.9)	5 (11.6)	0.978
Overweight	34 (31.2)	12 (27.9)	
Obese I	25 (22.9)	9 (20.9)	
Obese II	18 (16.5)	8 (18.6)	
Morbid obesity	19 (17.4)	9 (20.9)	
Education levels			
Illiterate	48 (22.4)	18 (20.9)	0.724
Read & write	28 (13.2)	10 (11.6)	
Primary school	78 (36.4)	28 (32.6)	
Secondary school	42 (19.6)	20 (23.3)	
Graduate & Postgraduate	18 (8.4)	10 (11.6)	
Occupation			
Private	16 (7.5)	8 (9.3)	0.280

Employee	4 (1.9)	2 (2.3)	
Unemployed	176 (82.2)	74 (86.0)	
Retired	18 (8.4)	2 (2.3)	
Residence			
Rural	38 (17.8)	14 (16.3)	0.760
Urban	176 (82.2)	72 (83.7)	
History of smoking			
Yes	16 (7.5)	4 (4.6)	0.691
No	178 (87.8)	78 (90.8)	
Ex-smoker	10 (4.7)	4 (4.6)	
Physical activities			
Light	130 (60.7)	46 (53.5)	0.153
Moderate	84 (39.3)	40 (46.5)	
Family history of urinary incontinence			
Yes	132 (61.7)	62 (72.0)	0.088
No	82 (38.3)	24 (28.0)	

4.6: Association of obstetrical factors, comorbidities and habits with UI

Analysis of age at marriage indicated no significant differences, with individuals marrying between ages 9-20 showing UI in 71.0% of cases compared to 76.7% among those marrying later (p=0.396).

When evaluating maternal age at first birth, the p-value of 0.252 indicated no statistical significance. Similarly, the age at last birth did not reveal significant associations, with UI rate. However, significant differences were observed in relation to gravida, where those with 0-5 pregnancies reported a lower incidence of UI (30.8%) than those with 6-10 pregnancies (58.8%), achieving a p-value of 0.035. A similar trend was noted in parity.

The presence of hypertension was significantly associated with UI, as 59.8% of women with hypertension reported UI compared to 44.2% without, with a p-value of 0.022. Conversely, diabetes mellitus also showed a significant correlation, with 43.0% of diabetic individuals Moreover, the occurrence of chronic cough demonstrated a strong association with UI, as 21.5% of affected individuals reported UI. Physical activity levels indicated a slight trend where moderate activity was associated with a lower incidence of UI (43.9% among UI cases). caffeine intake presented a significant association, with 14.8%. Drug history was significantly relevant to UI, particularly concerning diuretics, with 26.2% of users reporting UI .hormonal replacement therapy also demonstrated a significant association.

Table 5: Association of obstetrical factors, comorbidities and habits with UI.

Variables	**Urinary Incontinence**		**P value**
	Yes 214 (71.3)	**No 86 (28.7)**	
Age of marriage in years			
9- 20	152 (71.0)	66 (76.7)	0.396
21- 32	50 (23.4)	18 (20.9)	
33- 44	12 (5.6)	2 (2.3)	
Maternal age at 1st birth in years			
13- 22	166 (77.6)	71 (82.6)	0.252
23- 32	42 (19.6)	15 (17.4)	
33- 42	6 (2.8)	0 (0.0)	
Maternal age at last birth in years			
17- 25	12 (5.6)	8 (9.3)	0.398
26- 35	107 (50.0)	45 (52.3)	
36- 44	95 (44.4)	33 (38.4)	
Duration of menopause in years			
2-11	137 (64.0)	63 (73.3)	0.308
12- 22	60 (28.0)	18 (20.9)	
23- 33	17 (7.9)	5 (5.8)	
Gravida			
< 5	66 (30.8)	40 (46.5)	**0.035**
6-10	126 (58.8)	40(46.5)	
>10	22 (10.4)	6 (7.0)	

Parity			
< 5	86 (40.2)	48 (55.8)	**0.048**
6-10	114 (53.3)	34 (39.5)	
>10	14 (6.5)	4 (5.7)	
Abortions			
0-2	194 (90.6)	78 (90.7)	0.991
>2	20 (9.4)	8 (90.3)	
Stillbirth			
None	186 (86.9)	74 (86.0)	0.396
One	12 (5.6)	8 (9.3)	
Two	12 (5.6)	4 (4.7)	
Three	4 (1.9)	0 (0.0)	
Twins			
None	200 (93.5)	82 (95.4)	0.627
One	12 (5.6)	4 (4.6)	
Two	2 (0.9)	0 (0.0)	
Birth weight > 4Kgm			
Yes	132 (67.6)	56 (65.1)	0.337
No	80 (37.4)	30 (34.9)	
History of difficult labor			
Yes	178 (83.2)	72 (83.7)	0.529
No	36 (16.8)	14 (16.3)	
Type of delivery			
Normal vaginal deliveries	158 (73.8)	46 (53.3)	0.135
Assisted vaginal deliveries	7 (3.3)	5 (5.8)	
Cesarean section	49 (22.9)	35 (40.9)	
Comorbid diseases*			
Hypertension	128 (59.8)	38 (44.2)	**0.022**
Diabetes Mellitus	92 (43.0)	16 (18.6)	
Others	36 (16.8)	10 (11.6)	
Signs and symptoms			
Chronic cough	46 (21.5)	4 (4.6)	**0.001**
Constipation	50 (23.4)	8 (9.3)	
Recurrent urinary tract infection	114 (53.3)	26 (30.2)	
Surgical history*			
Caesarian section	52 (24.3)	38 (44.2)	0.257
Hysterectomy	20 (9.3)	12 (13.9)	
Urinary tract surgeries	6 (2.8)	2 (2.3)	
Dilatation and curettage	32 (15.0)	8 (9.3)	
Pelvic organ prolapses	6 (2.8)	2 (2.3)	
Adnexial surgeries	4 (1.9)	0 (0.0)	
Others	94 (43.9)	24 (27.9)	
Physical activities			
Light	120 (56.1)	56 (65.1)	0.157
Moderate	94 (43.9)	30 (34.9)	
Caffeine intake			
No	176 (85.2)	82 (95.3)	**0.010**
Yes	30 (14.8)	4 (4.7)	
Drug history			
Diuretics	56 (26.2)	10 (11.6)	**0.004**
Antihypertensive	116 (54.2)	34 (39.5)	
Sedatives	8 (3.7)	2 (2.3)	
Others*	50 (23.4)	12 (13.9)	
Hormone replacement therapy	10 (4.7)	4 (4.6)	
Hormone replacement therapy duration			n=(14)
2 months	2 (0.9)	2 (2.3)	**0.015**
3 months	6 (2.8)	0 (0.0)	

6 months	2 (0.9)	0 (0.0)	
10 months	0 (0.0)	2 (2.3)	

DISCUSSION

Urinary incontinence is one of the most common symptoms during menopause, leading to a decreased QoL and limited social activities.[12]

In the **present study**, out of 300 menopausal women aged 44-77 years, more than two third presented with UI. The reported prevalence of UI varies widely because of the different definitions and assessment tools for diagnosis are employed.[12] The prevalence estimates for UI ranged from 23% aged 30-59 years in **Islam et al.,(2018)[13] in Bangladish**. 25.1% to 26.4% in women aged 45-64 in **Milson et al.,(2014)[14] in Netherland**, 39% in women mean age 54 years in **Alizadeh et al.,(2022)[12] in Tabriz**, 46% in women with the mean age of 48 in **Rashidi et al.,(2019)[15] in different cities of Iran**, 46.9% in women aged 40-65 years in **Karcam et al.,(2024)[16] in Turkey** and 51.7% in women aged 28 -85 years in **Ahmed et al., study (2013)[17] in Erbil.**

The difference observed in the results may be due to racial and ethnic differences between countries and participants' socio-demographic characteristics. Age, duration and parity are among the main factors after race and ethnicity.

Surprisingly, more than two third of postmenopausal women in the present study have MUI, whereas, 17.29% had UUI and 12.15% had SUI. **In Alizadeh et al., (2023)[12] in Iran** the prevalence SUI was 20.6% (the most common type), 10.4% for UUI, and 8.5% for MUI. In a study **by Ajith et al.,(2019)[18] in Kerala, India**, who reported incontinence in post menopausal women was 26.47%, 13.9% was for SUI, 7.2% for MUI, and 5.4% for UUI.. In the study of **Zhu et al.,(2010)[19] in Beiji** The relatively high percentage of MUI in the present study could be due to in part that 210 (70%) of the studied menopausal women were of low educational level that might impact their understanding to the questionnaire about their complaint of UI. Moreover, the prevalence is influenced by the diagnostic tool used. Furthermore, it has been demonstrated that the fertility characteristics of women, especially the number of children, can influence the type of UI as **in Islam al.,(2018)[13] in Bangladish**. As such fertility characteristics may vary across different geographical regions, the prevalence of UI types may also differ.

The present study revealed a signifcant association between UI and higher BMI. Recent studies have demonstrated that overweight and obesity pose a heightened risk for UI in women as in **Batmani et al., (2020)[20] meta analysis, Aune et al,. (2019)[21] meta analysis** and **Sievert et al.,(2022)[22] in Qatar**.

The current study showed that UI were more prevalent in women married at an earlier age and younger women at first birth. Studies investigating the effect of age at first birth on UI gave inconsistent conclusions. A meta analysis, **Ren et al., (2022)[23]** elucidate the association between age at first birth and UI after delivery**,** while another study**, Rotveit et al., (2006)[24] in Norway** showed that age at first birth over 25 years is associated with UI.

The current study indicated that menopausal women with history of multipara (6-10) have UI in half of the sample. Similar to **Al shehri et al., (2022)[25] in Saudi arabia** and **Ahmed et al., (2013)[17] In Erbil** which showed multiparity as significant risk. factor for urinary incontinence as 50.4 for more than three pregnancies and 61.3 %for more than 5 pregnancies. **Demir et al., (2017)[26] in Izmer, Turkey** on 719 women also showed multiparity as key risk factor for urinay incontinence.

Which disagree with **Alizadeh et al (2022)[12] in Tabriz** which showed both SUI and UUI are significantly lower in women with three childbirth than women with fewer child birth.

A per **this study**, comorbid diseases such as DM significantly associated with UI. Previous researches have confirmed the significant relationship between DM and UI. As in **Ahmed et al., (2013)[27] in Erbil, (83.2%) and Al-shehri et al.,(2022)[25] in Saudi arabia with (58.9%)**. A likely cause of UI in diabetic women is microvascular damage to the innervations of the bladder and urethral sphincter, sphincter dysfunction, bladder instability, urinary retention, chronic bacterial colonization and UTIs, and elevated postvoid residual urine volume that contribute to overflow UI.[26]

While hypertention in the current study displayed significant association (p less than 0.008) similar to **Demir et al (2017)[26] in Turkey.**

Contrary to **Moudi et al., (2017)[28] in Amirkala** which showed no association between hypertention and UI and **Pang et al (2024)[29] in regions of China** considered HTN as independent risk factor for new onset UUI and SUI in chinese adult women more than 20 years old.

In the Iraqian study done by **Razzaq et al.,(2024)[30] in Baghdad**, the overall prevalence of UI was 51.7%; 26% SUI, 31% MUI, and 43% UUI

All these studies are not in line with the present study in which MUI was the most common type of UI. While in **Ahmed et al., (2013)[17] in Erbil** the prevalence of UI is MUI 63.8%,UUI 13.3% and SUI 5.4%, which showed the most common type of incontinence is mixed UI similar to the current study.

Antihypertensive drugs such as angiotensin receptor bloker (ARB) showed significant association with UI as in **Najafi et al., (2022)[31] in Iran**.

The present study demonstrated a significant role of past UTI in UI. It was stated that the incidence of UTIs increases around menopause.[96] Women with urgency urinary incontinence refractory to antimuscarinic therapy had more bacteria and a more diverse urinary microbiome.

As compared with patients without UI, patients with UI showed a more frequent cough and constipation sign and symptom. Several studies identified constipation and chronic cough both as risk factors of UI **Ahmed et al (2013)[17] in Erbil**. **Ajith et al(2019)[18] in Kochi, India** which mentioned chronic cough as independent risk factor for UI.

In the **present study**, UI were more evident in menopause women who consume moderate caffeine quantities. It was established that reducing caffeine intake is a common recommendation for women with UUI This recommendation is based on evidence that caffeine promotes diuresis which might increase the likelihood of urgency-related involuntary urine loss.as in scoping review of **Le Berr et al ., (2020).[32]**

In the **present study**, women on HRT for longer periods were more prone to develop UI than those without such therapy. In a study **Paive et al., (2018)[33]** were the use of HT regimens may predispose to the de novo development or worsening of pre-existing SUI.

CONCLUSIONS

1. The percentage of UI among postmenopausal women was more than two-third which is considered high compared with the global prevalence.
2. Mixed UI (stress and urge) is the most common type accounting for more than two-third of affected women.
3. Obesity, early marriage, high number of gravida and parity, presence of comorbidities (especially DM and hypertension), recurrent UTI, using of diuretics, caffeine intake and using HRT are risk factors for UI in postmenopausal women.

Recommendations

1. The high prevalence of UI among postmenopausal women sounds alarm about the size of the problem.
2. Establishing therapeutic program to match the patient's individual needs by enhancement of the role of interdisciplinary team starting from the PHC as the first step in detection, counselling and managements.
3. Controlling of some modifiable factors such as obesity by weight reduction and healthy lifestyle, decrease caffeine intake, proper control and management of diabetes and hypertention, and management of recurrent UTI.

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