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Original Article

Urology Section

A Cross-sectional Study on Urinary Incontinence: Prevalence, Risk Factors, and Impact on Quality of Life among Females in Northern Border Region Saudi Arabia

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ABSTRACT

Introduction: Urinary Incontinence (UI) is the involuntary leakage of urine loss that can be objectively confirmed and is a social and hygienic concern. The pathophysiology of UI is influenced by factors such as pregnancy, age, obesity, and weakend pelvic floors.

Aim: To evaluate the prevalence of UI, identify assosciated risk factors, and its impact on the quality of life among females.

Materials and Methods: A descriptive cross-sectional study was conducted among 1001 females in Department of Physiology, College of Medicine,Northern Border University, Arar, Saudi Arabia from March 2025 to May 2025 Northern Saudi Arabia from March 2025 to May 2025, following approval from the local bioethical committee of Northern Border University. An online survey was conveniently distributed via social media. The information was displayed using percentages and frequencies. Independent predictors of UI were identified using binary logistic regression , with a p-value of <0.05 was considered significant.

Results: A total of 1001 females were included, with Urge Urinary Incontinence (UUI) being the most common type, reported by 431 participants (43.1%), followed by mixed UI 344 (34.4%)and stress UI 255(25.5%). Significant associations between UUI and various factors, including age, marital status, education, occupation, weight, height, obstetric or surgical history, and the presence of chronic disease (p-value<0.001). Stress UI showed a more modest increase, peaking among obese individuals (59,32.1%). Overall 264 respondents (26.4%) reported a negative impact of UI on social life. Logistic regression analysis identified chronic disease as a highly significant factor, with an Odds Ratio (OR=0.529; p-value<0.001), suggesting more than double the risk of incontinence.

Conclusion: Age, marital status, occupation, Body Mass Index (BMI), and chronic disease are significantly associated with UUI. These factors may influence both the risk and severity of symptoms, highlighting the importance of individualised assessment and targeted interventions.

Keywords: Stress incontinence, Urinary leakage, Urgency, Women's health

INTRODUCTION

Urinary Incontinence (UI) is defined as the involuntary leakage of urine, which poses social and hygienic challenges [1]. It affects both males and females, although it is more prevalent among females [2]. In femlaes, UI is frequently linked to weak pelvic floor muscles and bladder dysfunction [3]. In addition to typical physiological changes like pregnancy and menopause, it can be caused by certain medical conditions like diabetes, neurological disorders,constipation, urinary tract infections and in males, prostatic enlargement [4]. Potential risk factors include age, smoking, family history of the condition, being a woman, having a neurological illness, and obesity [5]. Stress Urine Incontinence (SUI) is the most prevalent condition, triggered by increased intra-abdominal pressure during coughing, sneezing, laughing, or physical activity, acting on weakened bladder support [6]. This type people might cause urge to urinate suddenly before their bladder is full [7]. The second type is urgency incontinence, characterised by a sudden urge to urinate before the bladder reaches capacity [8]. UI is a serious public health issue that affects women more frequently than men [9]. Reported prevalence rates range between 25% and 45%, particularly among older women [10]. A study in the United States reported a 61.8% prevalence of UI [11], and another identified risk factors such as advanced age, parity, previous urological disorders, pelvic trauma, recurrent urinary infections, vaginal birth, and obstetric trauma [12]. Additional factors like alcohol and coffee consumption and diabetes mellitus contribute to the development of UI [13]. Previous research has classified UI into three main types: stress UI (SUI), urge UI, and mixed UI (MUI) [14]. Studies conducted in Saudi Arabia has shown that it is highly prevalent across a range of demographic groups, with age, obesity, and previous childbearing history as risk factors [13]. They also highlight the significant negative effects that UI has on mental health and social interactions, as well as overall quality of life. However, knowledge gaps remain, particularly concerning the experiences of different forms of UI and the influence of cultural attitudes on treatment-seeking behaviours. Therefore, the present study aimed to evaluate the prevalence, risk factors, and effects of UI on the quality of life among women in Northern Saudi Arabia.

MATERIALS AND METHODS

A cross-sectional study was conducted A descriptive cross-sectional study was conducted among 1001 females in Department of Physiology, College of Medicine, Northern Border University, Arar, Saudi Arabia from March 2025 to May 2025. This survey was carried out by the Declaration of Helsinki's tenets and was approved by the Ethics Committee, College of Medicine, Northern Border University (HAP-09-A-043; Decision No. 38-25-H, dated 17 March 2025).

Inclusion criteria: Adult women aged 18-50 years, residing in Northern Saudi Arabia, who were not seriously ill and had no diagnosis of pelvic disease were eligible for inclusion.

Exclusion criteria: Women with a history of neurological disease, psychiatric illness, or who live outside Northern Saudi Arabia were excluded.

Sample size calculation: The sample size "n" was determined using the "frequency in a proportion" formula

$$n = \frac{DEFF \times Np(1-p)}{(d^2/Z^2_{1-\alpha/2})\,(N-1) + p(1-p)}$$

and Epi Info version 3 based on regional census data. Assuming a hypothesised prevalence of 50%±5, 95% confidence level, and design effect (Deff) of 1, the minimum required sample size was 384 [15]. However, 1001 participants were ultimately included using convenience sampling.

Study Procedure

Data collection was anonymous and targeted at adult females in the Northern Border Region, Saudi Arabia. An predesigned, literature-based online was used [13,16], organised into five sections:

Demographics and clinical data: Information collected included age, nationality, residence, employment status, marital status, weight, height, and education level were recorded. Body Mass Index (BMI) was categorised as underweight (<18.5 kg/m²), normal (<25 kg/m²), overweight (25–30 kg/m²), and obese (≥30 kg/m²) [17]. Smoking status, caffeine intake, medication use, history of previous pelvic surgeries, presence of chronic medical conditions, number of vaginal and caesarean deliveries, and total number of deliveries were also documented.

Prevalence of urinary incontinence: An eight-item survey tool, developed and validated in previous studies, was used to assess the prevalence of UI and to differentiate between its types. Key items addressed included urine leakage in the past month, frequency and volume of leakage, UI type, and medical consultation.

Impact of urinary incontinence on quality: Eight questions were designed to investigate the influence of UI on social life. One yes or no question addressed the overall impact on social life, while the other questions focused on: daily activity, driving, sleep, social relations, and emotional well-being, and were answered by not at all, slightly, moderately, significantly, and extremely. This tool was assessed using a valid and trustworthy instrument that was formerly used with the Saudi populace was the King's Health Questionnaire [18,19].

Hydration, urination patterns, and factors affecting urinary incontinence: Ten questions were used to investigate the factors affecting UI. Two questions pertained to daily water or coffee intake, three focused on daily urination, night-time urination, and the frequency of changing underclothes. Finally, five questions addressed the impact of weather, anxiety, tight clothing, and trauma on UI. Informed consent was obtained from all participants at the beginning of the questionnaire. It was translated into Arabic, then translated back to English.

Questionnaire validity: Two specialists (two urologists) validated the content of the questionnaire. A pilot study was conducted with a convenience sample of 20 female respondents (not included in the final analysis). The reliability analysis of the scale, which consisted of 45 items, yielded a Cronbach's alpha value of 0.805, indicating good internal consistency.

STATISTICAL ANALYSIS

All statistical analyses were performed using IBM Statistical Package for Social Sciences (SPSS) Statistics version 29.0. Descriptive statistics were used to summarise the characteristics of the study population, with categorical data presented as frequencies and percentages. The Chi-square test was applied to assess associations between categorical variables, where appropriate, and a p-value of <0.05 was considered statistically significant. A multivariable binary logistic regression model was constructed to identify independent predictors of UUI. The dependent variable was UUI (Yes/No). Multiple sociodemographic and clinical variables were entered into the model simultaneously, and results were reported as Odds Ratios (ORs) and 95% Confidence Interval (CI). A p-value of <0.05 was considered statistically significant.

RESULTS

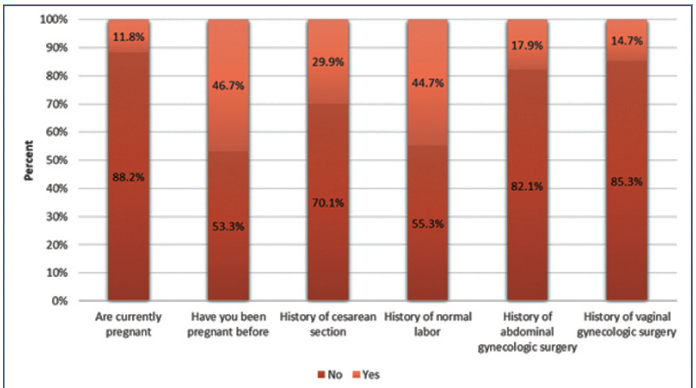
Of the participants, 436 (43.6%) were aged 18 to 25 years. Most of them were Saudi nationals, 962 (96.1%). Majority lived in Arar, 821 (82.0%). Regarding marital status, 550 (54.9%) were married. A total of 775 (77.4%) had completed university or higher education. Government employment was the most common occupation 415 (41.5%).

With respect to BMI, 500 (50.0%) had normal weight, 248 (24.8%) were overweight, 184 (18.4%) were obese, and 69 (6.9%) were underweight. Chronic conditions reported included diabetes in 135 (13.5%), hypertension in 86 (8.6%), asthma in 50 (5.0%), and constipation lasting more than one month in 43 (4.3%) [Table/Fig-1].

Variables		n (%)
Age (in years)	18-25	436 (43.5)
	26-35	192 (19.2)
	36-46	234 (23.4)
	>46	139 (13.9)
Nationality	Saudi	962 (96.1)
	Non Saudi	39 (3.9)
Residence	Arar	821 (82.0)
	Turaif	56 (5.6)
	Rafhah	38 (3.8)
	Others	86 (8.6)
Marital status	Single	389 (38.9)
	Married	550 (54.9)
	Divorced	41 (4.1)
	Widowed	21 (2.1)
Educational status	No formal education, but could read and write	17 (1.7)
	Primary school	12 (1.2)
	Preparatory school	37 (3.7)
	Secondary school	160 (16.0)
	University or higher	775 (77.4)
Occupation	Student	331 (33)
	Government employee	415 (41.5)
	Private sector employee	65 (6.5)
	Unemployed	190 (19.0)
BMI Category	Underweight	69 (6.9)
	Normal	500 (49.9)
	Overweight	248 (24.8)
	Obese	184 (18.4)
Do you have any chronic diseases?	Yes	563 (56.3)
Chronic conditions	Diabetes	135 (13.5)
	Hypertension	86 (8.6)
	Asthma	50 (5.0)
	Urinary and genital infections	40 (4.0)
	Pelvic/uterine prolapse	24 (2.4)
	Cough lasting more than a month	20 (2.0)
	Constipation lasting for more than one month	43 (4.3)
	Any other diseases	165 (16.5)
	No	438 (43.7)

[Table/Fig-1]: Demographic characteristics of the study participants (N=1001).

Among the female participants, 118 (11.8%) were currently pregnant, while 883 (88.2%) were not. A history of previous pregnancy was reported by 467 (46.7%) individuals. Regarding delivery history, 299 (29.9%) had undergone caesarean section, whereas 702 (70.1%) had not. In contrast, 447 (44.7%) had experienced normal vaginal delivery, while 554 (55.3%) had no such history [Table/Fig-2].



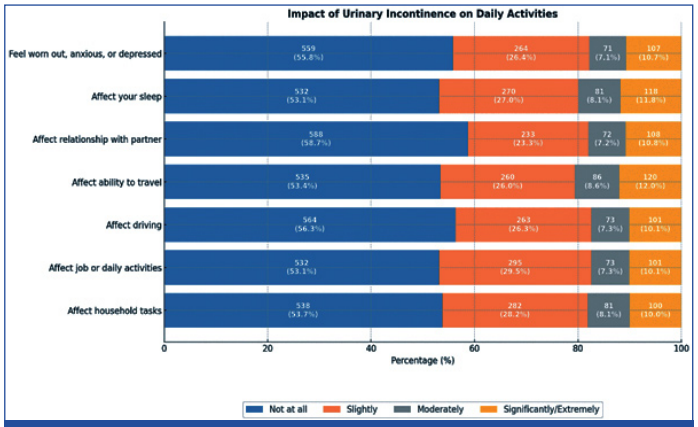
[Table/Fig-2]: Obstetric and gynaecological characteristics of study participants.

Among the participants, 260 (26%) females reported UI, while the majority 741 (74.0%) did not. In the past month, 198 (19.8%) reported recent UI. Furthermore, 431(43.1%) reported experiencing a sudden, intense urge to urinate with no ability to delay, while 344 (34.4%) experienced both urge and stress incontinence. Despite these symptoms, 798 (79.7%) had not sought medical consultation for UI [Table/Fig-3].

Questions	n (%)
Have you experienced urinary incontinence?	
No	741 (74.0)
Yes	260 (26.0)
In the last month, have you had any episodes of urine incontinence?	
No	803 (80.2)
Yes	198 (19.8)
How much would you estimate the amount of the leaked urine?	
Few drops	651 (65.0)
Small amount	204 (20.4)
Large amount	146 (14.6)
How many times a week did the urine leak occur?	
Less than once a week	204 (20.4)
Once a week	100 (10.0)
More than once a week	84 (8.4)
None	613 (61.2)
Have you ever had a sudden urge to use a bathroom and been unable to put it off?	
No	570 (56.9)
Yes	431 (43.1)
Have you ever had both stress and urge incontinence at the same time?	
No	657 (65.6)
Yes	344 (34.4)
Have you ever laughed or giggled and had your bladder empty without conscious control?	
No	746 (74.5)
Yes	255 (25.5)
Have you sought a medical consultation for your urinary incontinence problem?	
No	798 (79.7)
Yes	203 (20.3)

[Table/Fig-3]: Relevance of UI among study participants.

Urinary incontinence affected household tasks in 463 (46.3%), normal daily activities in 469 (46.9%), driving in 437 (43.7%), traveling in 466 (46.6%), partner relationships in 413 (41.3%), sleep in 469 (46.9%), and emotional well-being such as fatigue, anxiety, or depression in 442 (44.2%) of participants [Table/Fig-4].



[Table/Fig-4]: Impact of UI on quality of life among study participants.

Shows that 264 (26.4%) females reported that urinary incontinence limited their social life. About 47.1% of participants drank 1-3 cups of water, 36.1% drank 4-6 cups, and 16.9% consumed more than 6 cups. For coffee, 65.7% drank 1-3 cups daily. Urination frequency indicated that 67.1% urinated less than six times a day. Nighttime urination varied: 37.3% did not get up at night, 35.4% got up once, 16.4% twice, and 11.0% three times. Changing underclothes because of urine was not needed for 58.3%. Environmental and psychological factors influenced symptoms; 31.9% reported that tight clothing worsened their incontinence [Table/Fig-5].

Questions	n (%)
Does your urinary incontinence limit your social life?	
No	737 (73.6)
Yes	264 (26.4)
Your daily water intake	
1-3 cups	471 (47)
4-6 cups	361 (36.1)
More than 6 cups	169 (16.9)
Your daily coffee intake	
1-3 cups	658 (65.7)
4-6 cups	221 (22.1)
More than 6 cups	122 (12.2)
Have you ever had to wet the bed at night?	
Not at all	373 (37.2)
Once daily	354 (35.4)
Twice daily	164 (16.4)
Three times daily	110 (11.0)
How often do you urinate daily?	
Less than 6 times	672 (67.1)
More than 6 times	329 (32.9)
How many times a day do you get up in the middle of the night to urinate?	
Not at all	373 (37.2)
Once daily	354 (35.4)
Twice daily	164 (16.4)
Three times daily	110 (11.0)
How frequently do you change your underwear due to urination?	
Not at all	584 (58.3)
Once daily	187 (18.7)
Twice daily	126 (12.6)
Three times daily	104 (10.4)

Wearing tight clothes affect your urinary incontinence	
No	682 (68.1)
Yes	319 (31.9)
Does your disease worsen in cold weather?	
No	687 (68.6)
Yes	314 (31.4)
Do you suffer from any trauma or phobias, such as aerophobia or animals?	
No	731 (73.0)
Yes	270 (27.0)

[Table/Fig-5]: Hydration, urination patterns, and factors affecting urinary incontinence.

The Chi-squared analysis revealed significant associations between UUI and various demographic and health-related factors. Various demographic factors such as age, marital status, occupation, BMI and presence of chronic disease showed a significant relationship with UUI (p-value<0.001) [Table/Fig-6].

Variables	Response	Urge Incontinence		p-value
		No	Yes	
Age (in years)	18-25	303 (69.4%)	133 (30.5%)	<0.001*
	26-35	111 (57.8%)	81 (42.2%)	
	36-46	104 (44.4%)	130 (55.6%)	
	>46	52 (37.4%)	87 (62.6%)	
Nationality	Saudi	551 (57.3%)	411 (42.7%)	0.290
	Non Saudi	19 (48.7%)	20 (51.3%)	
Marital status	Single	300 (77.1%)	89 (22.9%)	<0.001*
	Married	238 (43.3%)	312 (56.7%)	
	Divorced	20 (48.8%)	21 (51.2%)	
	Widowed	12 (57.1%)	9 (42.9%)	
Educational status	Illiterate	8 (47.1%)	9 (52.9%)	0.144
	Primary school	4 (33.3%)	8 (66.7%)	
	Preparatory school	26 (70.3%)	11 (29.7%)	
	Secondary school	96 (60.0%)	64 (40.0%)	
	University or higher	436 (56.3%)	339 (43.7%)	
Occupation	Student	251 (75.8%)	80 (24.2%)	<0.001*
	Government employee	189 (45.5%)	226 (54.5%)	
	Private sector employee	27 (41.5%)	38 (58.5%)	
	Unemployed	103 (54.2%)	87 (45.8%)	
	Underweight	49 (71.0%)	20 (29.0%)	
	Normal	317 (63.4%)	183 (36.6%)	
	Overweight	133 (53.6%)	115 (46.4%)	
	Obese	71 (38.6%)	113 (61.4%)	
Chronic disease	No	465 (62.9%)	274 (37.1%)	<0.001*
	Yes	105 (40.1%)	157 (59.9%)	

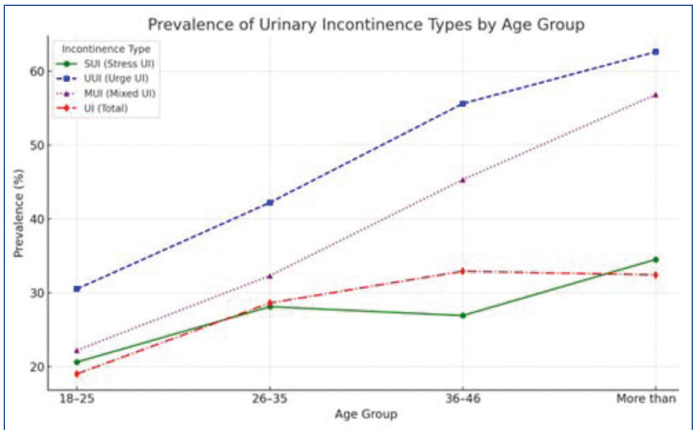
[Table/Fig-6]: Association between Sociodemographic and health factors and UUI.
*p-value significant at 0.05 level, Chi-squared test

Urge incontinence was significantly more prevalent among individuals with a history of pregnancy, caesarean section, normal labour, and gynaecologic surgeries (p-value<0.001) [Table/Fig-7].

Variables	Response	Urge Incontinence		p-value
		No	Yes	
Pregnancy status	No	534 (60.5%)	349 (39.5%)	<.001*
	Yes	36 (30.5%)	82 (69.5%)	
Pregnancy history	No	387 (72.5%)	147 (27.5%)	<.001*
	Yes	183 (39.2%)	284 (60.8%)	
Cesarean section history	No	460 (65.5%)	242 (34.5%)	<.001*
	Yes	110 (36.8%)	189 (63.2%)	
History of normal labor	No	388 (70.0%)	166 (30.0%)	<0.001*
	Yes	182 (40.7%)	265 (59.3%)	
History of abdominal gynaecologic surgery	No	512 (62.3%)	310 (37.7%)	<0.001*
	Yes	58 (32.4%)	121 (67.6%)	
History of vaginal gynaecologic surgery	No	530 (62.1%)	324 (37.9%)	<0.001*
	Yes	40 (27.2%)	107 (72.8%)	
Does your urinary incontinence limit your social life?	No	496 (67.3%)	241 (32.7%)	<0.001*
	Yes	74 (28.0%)	190 (72.0%)	

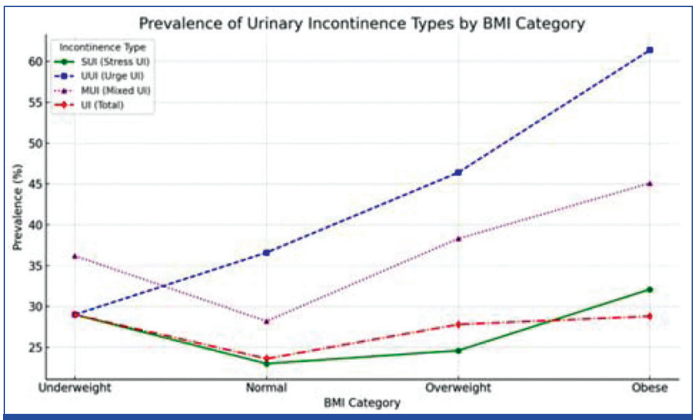
[Table/Fig-7]: Association between reproductive and surgical history and UUI.
*p-value significant at 0.05 level

Among women with urinary leakage, the prevalence of UI increased with age across all types. UUI showed the highest rates in each group, rising markedly from 30.5% in the 18-25 group to 62.6% among those over 46. Mixed UI (MUI) also showed a sharp increase, growing from 22.2% to 56.8% with age. Stress UI (SUI) presents a more gradual rise, peaking at 34.5% in the oldest age group. The overall prevalence of UI also rises from 19.0% to 32.4%, though with a slight dip observed in the 36-46 age group [Table/Fig-8].



[Table/Fig-8]: Prevalence of UI types across age groups.

Among women who reported urinary leakage, the prevalence of UI increases with BMI across all types, with UUI showing the highest rates in each category, rising sharply from 29.0% among underweight individuals to 61.4% in the obese group. Mixed UI (MUI) follows a similar trend, increasing from 36.2% to 45.1% as BMI rises. Stress UI (SUI) demonstrates a more modest rise, peaking at 32.1% among the obese. The overall prevalence of urinary incontinence also shows a slight upward trend, ranging from 29.0% in the underweight group to 28.8% in the obese category, with a slight dip observed among those with normal BMI [Table/Fig-9].



[Table/Fig-9]: Prevalence of UI types across BMI category.

The logistic regression analysis reveals several significant associations with UUI. Chronic disease is a highly significant factor (OR=0.529, p-value <0.001), indicating more than double the risk of incontinence [Table/Fig-10].

Variables	p-value	Odd ratio	95% Confidence Interval	
			Lower	Upper
Age group (years)				
18-25 (ref.)				
26-35	0.217	0.712	0.416	1.221
36-46	0.080	0.630	0.376	1.057
More than 46	0.667	0.902	0.565	1.441
Nationality	0.896	0.953	0.465	1.955
Marital status				
Single (ref.)				
Married	0.440	0.666	0.237	1.872
Divorced	0.173	1.958	0.746	5.144
Widowed	0.467	1.529	0.487	4.805
Educational status				
Illiterate (ref.)				
Primary school	0.571	1.358	0.472	3.907
Preparatory school	0.759	1.228	0.330	4.567
Secondary school	0.329	0.675	0.307	1.486
University or higher	0.242	1.280	0.847	1.933
Occupation				
Student (ref.)				
Government employee	0.941	1.021	0.595	1.752
Private sector employee	0.515	1.141	0.767	1.696
Unemployed	0.008*	2.329	1.241	4.371
BMI Category				
Underweight (ref.)				
Normal	0.027*	0.461	0.231	0.917
Overweight	0.017*	0.603	0.398	0.912
Obese	0.042*	0.651	0.430	0.984
Chronic disease	<.001*	0.529	0.379	0.739
Residence				
Arar (ref.)				
Turaif	0.026*	0.573	0.350	0.937
Rafhah	0.626	0.832	0.397	1.743
Others	0.014*	0.331	0.137	0.801

[Table/Fig-10]: Multivariate logistic regression analysis of risk factors associated with UUI.

DISCUSSION

Urinary Incontinence (UI) is a well-known health issue impacting women globally [20]. UI can lead to considerable physical discomfort and psychological distress, resulting in a reduced quality of life for women and imposing significant social and economic burdens [21]. Compared to earlier studies, these results showed that UUI was the most prevalent form (43.1%), followed by mixed UI (34.4%) and stress UI (25.5%) {refer [Table/Fig-11] for comparative prevalence across regions and study populations}

Author(s)/year* [Reference]	Study location	Sample size	Data collection protocol	Reported outcome(s)
Alharbi AH et al., 2024 [16]	Saudi Arabia	516 women.	Cross-sectional survey	32.4% of people have UI, with stress incontinence being the most prevalent kind.
Al-Badr A et al., 2011 [22]	Jeddah	379 women	Cross-sectional survey	The prevalence of UI was high, about 41.4% (95% CI, 36.6-46.5)
Alghamdi AA et al., 2021 [23]	Dammam, Saudi Arabia	802 women	Cross-sectional survey	UI symptoms are common among grand multiparas.
Nazzal Z et al., 2019 [7]	Palestin	381 women with T2DM	Cross-sectional survey	The prevalence of UI amongst Palestinian women with T2DM, regardless of the type, is high.
Bani-issa W et al., 2013 [24]	Emirate	300 women	Cross-sectional survey	(63%) reported as urinary incontinence
Ninomiya S et al., 2018 [25]	Japan	4804 women	Cross-sectional survey	SUI was present in 16.7% of cases (SUI in 13.0% and mixed urine incontinence in 3.7%).

[Table/Fig-11]: The prevalence of UI among females in Saudi Arabia and different countries [7,16,22-25].
*Author/year: first author surname or the affiliated two authors' names/year of publication; T2DM: Type 2 Diabetes Mellitus

Contrary to present study findings, previous studies reported that stress UI is the most prevalent type among adult women [26]. Age was significantly associated with UUI (p-value <0.001), in consistent with a previous study that identified age as a risk factor for UI [27]. This may be attributed to reduced functional bladder capacity and weakning of pelvic floor muscles.

Regarding BMI, it was found that SUI showed a modest increase, peaking at 32.1% among the obese. These findings align with a prior study demonstrating that insulin resistance, which often accompanies with overweight and obesity, significantly increases risk of UI [28]. Another study indicated that obesity is considered as an independent risk factor for SUI among middle-aged and elderly women [29]. The present study revealed highly significant associations between UUI and various obstetric and surgical history variables (p-value <0.001). Similar to earlier research, this study found a statistically significant correlation between UI and vaginal delivery, vaginal surgery, and childbirth [30].

In the current study, chronic disease is a highly significant factor (OR=0.529, p-value<0.001) for UI. These results are consistent with a Chinese study that found that diabetes, gynaecological disorders, cardiovascular disease, chronic pulmonary conditions, urinary tract diseases, and urine leakage during pregnancy are risk factors for UI [31].

This study reported that fatigue, anxiety, nervousness, or depression affecting 44.2% of women with UI are similar to those found that both depression and anxiety were predictors for the onset of UI [32]. Regarding the impact of UI on quality of life. Patients with UI who limited their social life were significantly more likely to report UI (58.3%) compared to those not socially affected (14.4%) (p-value<0.001). Like UI, it has a detrimental effect on work productivity in many areas, including interactions with coworkers, family, and during sexual activity. Consequently, UI may result in a reduction in patients' quality of life [33].

Limitation(s)

Limitations of this study include its cross-sectional design, which permits inference of correlation but not causation, and the absence of data on operative vaginal delivery. The reliance on self-reported questionnaires rather than clinical gynaecological examinations, urodynamic studies, or other diagnostic tests may result in inaccuracies or underreporting of UI. Diagnosis and severity assessment of UI were based on self-reported data, which is inevitably accompanied by recall errors. It was difficult to address all risk factors. In addition, differences in UI definitions can also contribute to bias in prevalence estimates.

CONCLUSION(S)

Age, marital status, occupation, BMI, and presence of chronic disease are significantly associated with UI. The findings highlight the importance of routine screening, medical consultation, and the development of effective UI intervention strategies by health

authorities. Moreover, healthcare providers should also consider screening women with incontinence for anxiety and depression. Furthermore, greater efforts are needed to pursue treatment to minimise UI and enhance quality of life. Future research using age-inclusive samples, a face-to-face interview for elderly participants and a wider range of recruiting techniques is needed.

REFERENCES

[1] Lukacz ES, Santiago-Lastra Y, Albo ME, Brubaker L. Urinary Incontinence in Women: A Review. JAMA. 2017 24;318(16):1592-604.
[2] Lee HY, Rhee Y, Choi KS. Urinary incontinence and the association with depression, stress, and self-esteem in older Korean Women. Sci Rep. 2021;11(1):9054.
[3] Seshan V, Francis F, Raghavan D, Arulappan J, Hashmi IA, Prince EJ, et al. Prevalence of urinary incontinence and its relationship with sociodemographic and obstetrical variables among omani women. SAGE Open Nurs. 2023;9:23779608231173803.
[4] Destegül E, Kocaöz S, Kara P, Yavuz A. Prevalence, affecting factors and relationship with toileting behaviors of lower urinary tract symptoms in pregnant women: A cross-sectional study. Eur Rev Med Pharmacol Sci. 2023;27(14):6769-79.
[5] Nakayama N, Tsuji T, Aoyama M, Fujino T, Liu M. Quality of life and the prevalence of urinary incontinence after surgical treatment for gynecologic cancer: A questionnaire survey. BMC Womens Health. 2020;20(1):148.
[6] Alshenqeti AM, Almutairi RE, Keram AM. Impact of urinary incontinence on quality of life among women of childbearing age in Al Madinah Al Munawara, Saudi Arabia. Cureus. 2022;14(5):e24886.
[7] Nazzal Z, Khatib B, Al-Quqa B, Abu-Taha L, Jaradat A. The prevalence and risk factors of urinary incontinence amongst Palestinian women with type 2 diabetes mellitus: A cross-sectional study. Arab J Urol. 2019;18(1):34-40.
[8] Al Kiyumi MH, Al Belushi ZI, Jaju S, Al Mahrezi AM. Urinary incontinence among Omani women: Prevalence, risk factors and impact on quality of life. Sultan Qaboos Univ Med J. 2020;20(1):e45-e53.
[9] Wuytack F, Moran P, Daly D, Begley C. Is there an association between parity and urinary incontinence in women during pregnancy and the first year postpartum?: A systematic review and meta-analysis. Neurourol Urodyn. 2022;41(1):54-90.
[10] Irwin DE, Kopp ZS, Agatep B, Milsom I, Abrams P. Worldwide prevalence estimates of lower urinary tract symptoms, overactive bladder, urinary incontinence and bladder outlet obstruction. BJU Int. 2011;108:1132-1138.
[11] Patel UJ, Godecker AL, Giles DL, Brown HW. Updated Prevalence of Urinary Incontinence in Women: 2015-2018 National Population-Based Survey Data. Female Pelvic Med Reconstr Surg. 2022;28(4):181-87.
[12] Alonezy MF, Metwally AS, Alhazmi OA, Alrehaili AO, Almohammadi AA, Aljuhani AS, et al. The prevalence and related risk factors of urinary incontinence among adult women in Al Medina Al Munawara, Saudi Arabia. Cureus. 2024;16(7):e64966.
[13] Alhamoud MAS, Julaih FA, Al-Aqil HDH, Almalki NAS, Alharthi FAG, Alghamdi AA, et al. The prevalence and risk factors of stress urinary incontinence among women in Saudi Arabia: A systematic review and meta-analysis. Healthcare (Basel). 2024;12(23):2440.
[14] Thabet A, Battecha K, Alayat M, Ali M, Mahmoud H, Ebid AA, et al. Prevalence of urinary incontinence among women in Saudi Arabia: A cross-sectional study. Eur Rev Med Pharmacol Sci. 2023;27(13):6040-45.
[15] Egbuchulem KI. The basics of sample size estimation: An editor's view. Ann Ib Postgrad Med. 2023;21(1):05-10.
[16] Alharbi AH, Almasry RH, Alsaywid B, Kaleemullah A, Khodri AT, Hariri FS, et al. Urinary Incontinence (UI) in Saudi female population: Prevalence, risk factors, and Impact on quality of life. Healthcare (Basel). 2024;12(23):2340.
[17] Weir CB, Jan A. BMI Classification percentile and cut off points. Treasure Island (FL): StatPearls Publishing; 2025 Jan-.available from: https://www.ncbi.nlm.nih.gov/books/NBK541070/
[18] Al Issa H, Abduldaiem AO, Selim M, Kofi M. Quality of life among adult Saudi women with urinary incontinence in Riyadh, KSA. Int J App Res. 2020;5:484-92.
[19] Hebbar S, Pandey H, Chawla A. Understanding King's Health Questionnaire (KHQ) in assessment of female urinary incontinence. Int J Res Med Sci. 2015;3(3):531-38.
[20] Zhang RQ, Xia MC, Cui F, Chen JW, Bian XD, Xie HJ, et al. Epidemiological survey of adult female stress urinary incontinence. BMC Womens Health. 2021;21(1):172.
[21] Xue K, Palmer MH, Zhou F. Prevalence and associated factors of urinary incontinence in women living in China: A literature review. BMC Urol. 2020;20(1):01-26.
[22] Al-Badr A, Brasha H, Al-Raddadi R, Noorwali F, Ross S. Prevalence of urinary incontinence among Saudi women. Int J Gynaecol Obstet. 2012;117(2):160-63.
[23] Alghamdi AA, Alyousif GF, Alghamdi RL, Almulhim FA, Alsadah HM, Almutawaa JM, et al. The prevalence of urinary incontinence symptoms among multiparous women: A survey of Saudi health-care centers. Int Urogynecol J. 2021;32(2):403-11.
[24] Bani-issa W, Fakhry R, Al Momani F. Urinary incontinence in Emirati women with diabetes mellitus type 2: Prevalence, risk factors and impact on life. J Clin Nurs. 2013;22(21-22):3084-94.
[25] Ninomiya S, Naito K, Nakanishi K, Okayama H. Prevalence and risk factors of urinary incontinence and overactive bladder in Japanese women. Low Urin Tract Symptoms. 2018;10(3):308-14.
[26] Mostafaei H, Sadeghi-Bazargani H, Hajebrahimi S, Salehi-Pourmehr H, Ghojazadeh M, Onur R, et al. Prevalence of female urinary incontinence in the developing world: A systematic review and meta-analysis-A Report from the Developing World Committee of the International Continence Society and Iranian Research Center for Evidence Based Medicine. Neurourol Urodyn. 2020;39(4):1063-86.
[27] Gardella B, Scatigno AL, Belli G, Gritti A, Visoná SD, Dominoni M. Aging of Pelvic Floor in Animal Models: A sistematic review of literature on the role of the extracellular matrix in the development of pelvic floor prolapse. Front Med (Lausanne). 2022;9:863945.
[28] Shang X, Fu Y, Jin X, Wang C, Wang P, Guo P, et al. Association of overweight, obesity and risk of urinary incontinence in middle-aged and older women: A meta epidemiology study. Front. Endocrinol. 2023;14:1220551.
[29] Schreiber Pedersen L, Lose G, Høybye MT, Elsner S, Waldmann A, Rudnicki M. Prevalence of urinary incontinence among women and analysis of potential risk factors in Germany and Denmark. Acta Obstet Gynecol Scand. 2017;96(8):939-948.
[30] Tähtinen RM, Cartwright R, Tsui JF, Aaltonen RL, Aoki Y, Cárdenas JL, et al. Long-term impact of mode of delivery on stress urinary incontinence and urgency urinary incontinence: A systematic review and meta-analysis. Eur Urol. 2016;70(1):148-58.
[31] Chang KM, Hsieh CH, Chiang HS, Lee TS. Risk factors for urinary incontinence among women aged 60 or over with hypertension in Taiwan. Taiwan J Obst Gynecol. 2014;53(2):183-86.
[32] Felde G, Ebbesen MH, Hunskaar S. Anxiety and depression associated with urinary incontinence. A 10-year follow-up study from the Norwegian HUNT study (EPINCONT). Neurourol Urodyn. 2017;36(2):322-28.
[33] Corrado B, Giardulli B, Polito F, Aprea S, Lanzano M, Dodaro C. The impact of urinary incontinence on quality of life: A cross-sectional study in the Metropolitan City of Naples. Geriatrics (Basel). 2020;5(4):96.

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