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# Prevalence of urinary incontinence among women in Saudi Arabia: a cross-sectional study

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**Abstract. – OBJECTIVE: Urinary incontinence is defined as involuntary loss of urine, a common health condition that is more frequent in women. It disturbs the affected individuals and interferes with their daily activities. This study aimed to estimate the prevalence of urinary incontinence among Saudi women in the western area of the Kingdom of Saudi Arabia.**

**SUBJECTS AND METHODS: A descriptive cross-sectional design was used for this study. A survey was administered to Saudi women in the western area of the Kingdom of Saudi Arabia ranging in age from 18 to 70 years. The data were collected using the Arabic version of the Questionnaire for Urinary Incontinence Diagnosis. Descriptive statistics were generated by calculating numbers and percentages of information on the prevalence of incontinence in women. *p*-values < 0.05 were considered statistically significant.**

**RESULTS: The prevalence of urinary incontinence was 44.2%, with the urge type being the most reported. Stress urinary incontinence was reported by 155 women (15.4%), urgency urinary incontinence by 257 women (25.6%), and mixed urinary incontinence by 102 women (10.15%).**

**CONCLUSIONS: Urinary incontinence is prevalent in women in Western Saudi Arabia. Age, multiparty obesity, and vaginal surgery are significant risk factors influencing its occurrence.**

*Key Words:*
Urinary incontinence, Women, Saudi, Prevalence, Female, Saudi Arabia.

## Introduction

The International Continence Society and Urogynecological Association described urinary incontinence (UI) as "any involuntary leakage of urine[1]"; UI has also been described as "the involuntary loss-of-urine complaint[2]".

Globally, more than 200 million people are affected; thus, UI is considered a global public health problem impacting various cultures and ethnicities[3,4]. This condition reportedly affects women 75% more frequently than men, has a prevalence of between 25-45%, and is more prevalent in older women[5].

A study in the United States[6] (2006-2012) showed a 53% prevalence of UI, and another study[7] has demonstrated risk factors such as advanced age, parity, previous urological disorders, pelvic trauma, recurrent infections of the urinary system, vaginal birth, and obstetric trauma. In addition, factors such as alcohol and coffee consumption and diabetes mellitus also have a role in UI development.

A previous study[8] has classified UI into 3 major types stress UI (SUI), urge UI, and mixed UI (MUI). The most frequent type is SUI, which represents 50-88% of all cases. It can be described as the unintentional leaking of urine while sneezing, coughing, or exerting effort that increases abdominal pressure.



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Stress urinary incontinence results from weakness of the pelvic floor muscles and failure of the complex ligamentous-muscular-fasciculate tissues[9]. Childbearing, trauma, hormonal imbalance, and genital surgeries are the most frequent causes of this multifactorial syndrome[9]. Patients with urge UI typically complain of a sudden, intense urge to urinate that is difficult to resist and frequently causes involuntary urine leaks[1]. Mixed urinary incontinence affects one in three women who have UI. It combines the symptoms of urge UI and SUI, greatly affecting the patient's quality of life[7]. There is also a less frequent type called overflow incontinence, which occurs owing to neurological disturbances; the presence of an obstruction caused by prostate hypertrophy; or the accumulation of urine volume in the bladder to an amount greater than its maximum capacity, causing the urine to flow through the urethra because of the pressure[10].

Urinary incontinence causes mental and physical deterioration, restricting the person's ability to work and increasing social isolation. It significantly affects women's social, physical, and psychological health, causing depression and anxiety because the restriction on daily living activities creates difficulty in maintaining an independent lifestyle. Compared with other chronic health conditions, such as diabetes mellitus and heart disease, UI has a major effect on patients' ability to work, which leads to a high economic burden on society, an enormous load on healthcare costs, and increased dependence on caregivers for daily life activities[11].

We have found no relevant studies on the incidence of UI in the western region; we found one study[21] that applied only to one city and did not determine the frequency of UI at the regional level. Therefore, this research aimed to estimate the prevalence of UI among Saudi women in the western area of the Kingdom of Saudi Arabia.

## Subjects and Methods

### Design

This descriptive cross-sectional study involved a maternity and social children's hospital in Makkah, Kingdom of Saudi Arabia, which is considered the basic reference for pediatrics, gynecologists, and obstetrics in Makkah. The survey was conducted only among Saudi women in the western region of the Kingdom of Saudi Arabia, the second largest region. According to the General Authority for Statistics, the number of Saudi women aged 15-74 exceeds 10 million. The Biomedical Research Ethics Committee at Umm Al-Qura University, Makkah, Saudi Arabia, authorized the research (Approval Number: HA-PO-02K- 011-2021-01-855). The study followed the principles of the Helsinki Declaration.

### Participants

Women aged 18 to 70 years were selected according to their age and region to be representative of the population of Saudi women in the western area. Each participant filled out a survey that assessed the prevalence of UI. Before starting the survey, all participants signed an informed consent form indicating their approval to participate in the study and to share the survey results for publication.

The sample size was determined using the mathematical equation Z 1-α/2 2P (1-P)/d2, allowing for type I errors at a 5% level of significance ($p < 0.05$) and 95% confidence interval, with the expected proportion from a previous study[12] being 42%. To achieve the study's objective, a sample of 1,000 participants was recommended.

The Questionnaire for Urinary Incontinence Diagnosis (QUID) was designed in English and serves as a diagnostic tool for determining the type of UI and assessing SUI and urge UI symptoms; it is a valid and responsive short instrument[13]. We translated the QUID into Arabic. The translated questionnaire was administered to 17 women in a pilot study to (1) ensure that the questions were understandable and correctly translated, (2) explore any unclear or missing points, (3) assess difficulties in the methodology during the research, and (4) assess the time required for completion. The Arabic version of the QUID was used to assess the prevalence of UI and determine its severity.

Each questionnaire item was designed to assess the severity (most of the time, often, occasionally, rarely, never) during 6 daily life situations: (1) sneezing or coughing, (2) lifting something or bending down, (3) jogging, rapid walking, or exercise, (4) removing clothes to use the restroom, (5) feeling an uncomfortable and strong need to urinate before reaching the restroom, and (6) running to the restroom owing to a sudden, intense urge to urinate. The severity of each item was recorded during the analysis. All women participated in the research by registering with online forms (Google Forms).

Women were eligible to participate if they (1) were Saudi women, (2) lived in the western area, (3) had symptoms of UI, and (4) were aged between 18 and 70 years. Women were excluded if they (1) were non-Saudi women and (2) were aged under 18 or over 70 years. The translated QUID

was used to determine the type of UI. It classified UI into SUI, urge, and MUI by evaluating the regularity of urine leaks[14]. When the total score of items 1, 2, and 3 was ≥ 4, this was considered SUI. When the total score of items 4, 5, and 6 was ≥ 6, this was considered urge UI. When urge UI and SUI were both present, this was defined as MUI.

The questionnaire contained sections on risk factors for UI, demographic factors (age, nationality, level of education, and occupation), impact on activities of daily living, and obstetric information (parity, history of cesarean section, or history of vaginal surgery). Women with UI were questioned about its impact on activities of daily living or social interactions (e.g., visiting friends and relatives or shopping) and sexual activities.

### Statistical Analysis

Descriptive statistics were generated by computing prevalence data (numbers and percentages) and UI type. Categorical data, including marital status and parity, were expressed as numbers and percentages. Age, weight, height, and body mass index (BMI) were continuous variables defined as mean ± standard deviation. A $p$-value of ≤ 0.05 was deemed statistically significant. All data were analyzed using the statistical package SPSS Statistics 16 for Windows (SPSS Inc., Chicago, IL, USA).

## Results

In total, 1,005 women completed the online forms (Google forms) published on social media and distributed to women at the maternity and children's hospital in Makkah. Urinary incontinence was reported by 444 women (44.2%). Accordingly, the distribution of the types of UI was as follows: SUI was reported by 155 women (15.4%), urge UI by 257 women (25.6%), and MUI by 102 women (10.15%), with a mean age of 40.2 (18-69) years (Table I).

Comparing the risk factors between women with and without UI showed that women with UI had more risk factors than women without. Women ≥ 35 years represented 75.2% of women with UI and 59.5% of women without. Women with parity > 3 represented 54.7% of women with UI and 37.25% of women without. Women with BMI ≥ 35 represented 16% of women with UI and 9.3% of women without. Women with a history of vaginal gynecologic surgery represented 22.75% of women with UI and 13.4% of women without. Women with a history of cesarean delivery represented 35.8% of women with UI and 25.7% of women without (Table II).

Different symptoms of UI occurred with different types and grades of UI: mild stress (55.6%), moderate stress (16.7%), severe stress (27.6%) and mild urge (23.7%), moderate urge (29.8), and severe urge (46.5%) (Table III).

The consequences of UI included interference with prayer in 24.55% of the women, effect on social life in 23.4%, effect on the state of mind in 39.6%, and effect on sexual activities in 12.8% (Table IV).

## Discussion

This research aimed to determine the prevalence of UI in Saudi women in the western area of Saudi Arabia. The current study showed that the overall incidence of UI among women in Western Saudi Arabia was 44.2%. Urge UI was

**Table I.** Demographic and clinical characteristics of the study subjects (n = 1,005).

| Characteristics | Description | No. | Percentage % |
|---|---|---|---|
| Age | < 35 y | 337 | 33.53% |
| | ≥ 35 y | 668 | 66.47% |
| BMI | < 35 | 882 | 87.76% |
| | ≥ 35 | 123 | 12.24% |
| Occupation | Employed | 887 | 88.26% |
| | Unemployed | 118 | 11.74% |
| Marital status | Married | 786 | 78.21% |
| | Single | 219 | 21.795 |
| Parity | < 3 | 553 | 55.02% |
| | >3 | 452 | 44.98% |
| History of caesarean delivery | Yes | 303 | 31.15% |
| | No | 702 | 69.85% |
| History of vaginal gynecologic surgery | Yes | 176 | 17.51% |
| | No | 829 | 82.49% |

**Table II.** Risk factors comparison between continent *vs.* incontinent women.

| Risk factor | Description | Urinary incontinence | | OR | *p*-value |
|---|---|---|---|---|---|
| | | Yes (n = 444) | No (n = 561) | | |
| Age | ≥ 35 y | 334 (75.23%) | 334 (59.54%) | 2.064 | 0.0001 |
| BMI | ≥ 35 | 71 (16%) | 52 (9.27%) | 1.863 | 0.001 |
| Parity | > 3 | 243 (54.73%) | 209 (37.25%) | 2.029 | 0.0001 |
| Cesarean delivery | Yes | 159 (35.81%) | 144 (25.67%) | 1.617 | 0.0001 |
| History of vaginal gynecologic surgery | Yes | 101 (22.75%) | 75 (13.37%) | 1.909 | 0.0001 |

**Table III.** Different symptoms of urinary incontinence according to different types.

| Symptoms | Type | No. | % |
|---|---|---|---|
| Leakage of urine when you cough or sneeze | Stress | 143 | 55.64% |
| Leakage of urine when you bend down or lift something up? | Stress | 43 | 16.73% |
| Leakage of urine when you walk quickly, jog or exercise | Stress | 71 | 27.63% |
| Leakage of urine while you are undressing in order to use the toilet | Urge | 85 | 23.68% |
| Leakage of urine (even small drops) with strong and uncomfortable need to urinate before reaching the toilet | Urge | 107 | 29.81% |
| Have to rush to the bathroom because patient get a sudden, strong need to urinate? | Urge | 167 | 46.51% |

**Table IV.** Consequences of urinary incontinence.

| Consequence | No. | % |
|---|---|---|
| Interference with your performing prayers | 109 | 24.55% |
| Affect patient social life (shopping, visiting friends, etc.) | 104 | 23.42% |
| Affect patient state of mind, or made you depressed | 176 | 39.64% |
| Affect patient marital or sexual relation with your husband | 57 | 12.84% |

the most frequent type (25.6%), followed by SUI (15.4%) and MUI (10.15%). The associated risk factors were age > 35 years, BMI ≥ 35, parity > 3, and history of vaginal gynecologic surgeries and cesarean deliveries.

When comparing similar studies[15-18] conducted in neighboring Arabic countries, the current study found a lower prevalence of UI than that reported by an Egyptian study (54.8%)[15], but a higher prevalence than that reported by studies in Qatar (20.6%)[16], the United Arab Emirates (20.3%)[17], and Oman (34.5%)[18]. Similarly, lower prevalence rates were reported in European countries such as Spain (23%), France (44%), Germany (41%)[19], and Sweden (44%)[20]. The disparity in the prevalence estimated by various studies could be due to different variables across different countries, such as variations in study design, sample size, age groups, UI definitions, execution strategies, and data gathering tools[21].

The current study results are consistent with a previously published study[9] that found UI prevalent among women in Saudi Arabia. Significant risk factors for UI development include hypertension, age, multiparty, and obesity[9]. The most typical UI type in the current study was urge UI (25.6%), which is inconsistent with many studies[18-24] that identified SUI as the most frequent type. Meanwhile, limited studies[25,26] have recognized MUI as the most frequent type. The main UI risk factor identified in this study was older age, where 75% of women with UI were older than 35 years. Corroborating evidence for this finding is that age is associated with decreased capacity and elasticity of the bladder, reduced sensation, and detrusor instability, which can result in UI[27].

Similar results were published in a previous study[21] that found that female UI is prevalent in Saudi Arabia. Age, multiparty, obesity, and hypertension are significant risk factors influencing the incidence of UI. Previous studies[7,18-27] with similar results found a stronger relationship with common medical conditions such as hypertension, asthma, and diabetes. However, the current research discovered a link between UI and parity > 3 and BMI ≥ 35, consistent with previously published results[14,18,23].

Cesarean deliveries were considered a risk factor in the current study, where 35% of women with UI had cesarean deliveries at least

once in their lives; this contradicts the results of the Omani study, in which normal vaginal deliveries were more associated with UI[18]. The result agrees with the evidence suggesting that pregnancy, rather than childbirth, is strongly associated with UI[28].

The present study indicated that UI negatively affects the quality of life; this is expected considering Muslim culture and the high value of prayers in Islam, where cleanness and purity are conditions for prayers (Salat), which occur 5 times a day. Overall, 24.55% of women reported that UI interferes with their prayers, and many studies[15,16,18,23] conducted in Arab countries agree with this finding. As much as 39.6% of women who participated in this study reported severe urge UI, whereas 12.4% reported severe SUI. Thus, UI interrupting daily activities is expected. The negative effect of UI on quality of life includes psychosocial and emotional aspects, in which 23.4% of women reported that UI affects their social lives, 39.64% reported that UI affects their state of mind, and 12.8% reported that UI affects their sexual activities. These findings agree with those of previous reports[18,24,29-31]. The results highlight the need for detecting UI early and recognizing UI as a serious problem that deserves medical attention.

### Limitations

The primary limitation of this study is the method used to collect the information. Since it is a form of a self-report questionnaire, the information was not confirmed clinically by gynecologic examination, urodynamic studies, or other objective tests; thus, information about past events is less precise.

## Conclusions

The UI prevalence among women who reside in the Western Saudi Arabia was 41.4%, with the urge type being the most reported. The primary UI risk factors identified in this study were age < 35 years, parity > 3, BMI ≥ 35, and history of vaginal gynecologic surgeries and cesarean deliveries.

We recommend providing women with adequate knowledge through health care education to prevent UI. A nationally well-designed healthcare system for healthy women and women with UI is highly recommended. Further research is needed to study UI prevalence among Saudi women on a national level and not just in the Western area.

### Conflict of Interest

The Authors declare that they have no conflict of interests.

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### Ethics Approval

This study protocol was reviewed and approved by the Biomedical Ethics Committee at Umm Al Qura University, Makkah, Saudi Arabia, with approval number (HA-PO-02K- 011-2021-01-855).

### Informed Consent

Informed consent was obtained before starting the survey. The authors confirm that they have read the Journal's position on issues involved in ethical publication and affirm that this work is consistent with those guidelines.

### Availability of Data and Materials

The data used to support the findings of this study are available from the corresponding author upon request.

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No funding was used in this study.

### Authors' Contribution

All authors contributed to the study's conception and design. Material preparation, data collection, and analysis were performed. The first draft of the manuscript was written by [AT and MA], and all authors commented on previous versions. All authors read and approved the final manuscript. The first author [AT] had the idea for the article, and all authors reviewed the manuscript and data analysis and who drafted and/or critically revised the work.

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