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Prevalence of Urinary Incontinence and its Relationship With Sociodemographic and Obstetrical Variables Among Omani Women

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Abstract

Objective: Urinary incontinence (UI) is defined by the International Continence Society as any complaint of involuntary urine leakage. This research study highlights the prevalence, types, and associated factors of UI among women in Oman.

Methodology: A descriptive cross-sectional design was used to collect data using purposive sampling technique from 400 women between 20 and 60 years; who were attending outpatient department of a referral hospital in Oman. Women were assessed using the Questionnaire for Urinary Incontinence Diagnosis to determine the type of UI. The severity and the impact of UI in women were assessed using the female urinary tract symptoms module (ICIQ-UI-SF). Descriptive statistics were used to determine the prevalence and type of UI, and the Chi-square test was used to find the association between UI and sociodemographic and obstetrical variables.

Results: In our study, 28.25% of the women belonged to the age of 50–59 years. The point prevalence (per 1000) of UI among Omani women who were between 20 and 60 years was 44%. In the women who had UI, the majority were having stress UI (41.6%). In the women who had UI, the severity of UI, according to the ICIQ-UI-SF scoring, 15.2% of the women had slight, 50.3% had moderate, 33.1% had severe, and only 1.3% had very intense.

Conclusion: Understanding the prevalence of UI in every community and associated factors is essential for the policy makers and healthcare providers to consider the early diagnosis, prevention, health promotion, and management of UI.

Keywords

urinary incontinence, women, prevalence, Oman, risk factors

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Introduction

Urinary incontinence (UI) is defined by the International Continence Society (ICS) as any complaint of involuntary urine leakage (Haylen et al., 2010). UI has been reported as one of the most commonly prevalent health problems among women of all ages (Lee et al., 2020; Steibliene et al., 2020). Globally it is prevalent in most regions of different countries. The prevalence rates are often escalating, reaching up to 60% in women living in communities in the United States (Patel et al., 2022). Unlike most chronic health conditions, UI is not fatal but has a high impact on the quality of life (QoL) of the individual suffering from it (Seshan & Muliira, 2013). This debilitating condition is

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closely associated with physical, social, psychological, and financial adverse outcomes, which highly impact health-related QoL. Overall UI prevalence rates in Middle Eastern countries range between 20.3% and 54.8% (Alshehri et al., 2022). Among the Middle East countries, Qatar, United Arab Emirates, Jeddah, and Riyadh in Saudi Arabia reported UI prevalence as 20.6%, 20.3%, 41.4%, and 29%, respectively (Alshehri et al., 2022; Ghafouri et al., 2014). A study surveyed the prevalence of UI among Omani women and reported that 34.5% of the women had UI symptoms, and only 41 women sought medical advice (Al Kiyumi et al., 2020). Often women consider UI part of their aging process; some women are shy to discuss it, thinking it is culturally sensitive, while studies report the need for treatment and possible reversal of the condition (Laganà et al., 2014).

Research studies report various reasons as risk factors of UI. UI symptoms among women are presented as different types, such as stress incontinence, urgency incontinence, and mixed incontinence which are commonly reported, while the rare subtypes are postural incontinence, nocturnal enuresis, and continuous incontinence. ICS and International Urogynecological Association (IUGA) have defined stress incontinence as leaking urine due to exertion, coughing, and sneezing, while urgency incontinence is an exhilarating feeling to void, which is difficult to control. Women with a mixed type have also reported having an overactive bladder (Aoki et al., 2017). A close association has been drawn between age and the occurrence of UI (Stewart et al., 2014). A two-country study surveyed women in Germany and Denmark reported that stress incontinence is more prevalent among younger women while women over 80 years old had symptoms of both mixed UI and Urgency UI. The same study also found that obesity was a reason for UI's prevalence. Women with body mass index (BMI) ≥35 had the highest prevalence of UI symptoms, thus indicating obesity as a risk factor (Schreiber Pedersen et al., 2017). Similarly, a literature review of 12 studies reported the significant risk factors as parity, age, BMI, recurrent urinary tract infections, complications due to hysterectomy, menopause, and recurrent abortions (Seshan et al., 2016). Key risk factors identified by other studies include hypertension, diabetes mellitus, chronic cough, chronic constipation, history of prolonged labor, various gynecological procedures, and recurrent urinary tract infections (Biswas et al., 2017; Demir et al., 2017).

UI is prevalent among Omani women, but data regarding this population's prevalence and associated factors have yet to be available. The published reviews on the prevalence and risk factors of UI, specifically among women, highlight the need for more research surveys and point out the lack of sufficient data that may assist in the appropriate therapeutic planning for managing UI. It is essential to also incorporate health promotional activities from the perinatal period to prevent the occurrence of UI. There is a need for more research to understand the prevalence and risk factors in Arab countries, as healthcare providers have a lacuna in the early identification and primary prevention of UI. A greater understanding of the risk factors that may predispose women to develop UI would help the health care providers to ensure early diagnosis and to target those who can benefit from preventive and health-promoting intervention (Seshan & Muliira, 2013). This research study highlights the prevalence, types, and associated factors of UI among women in Oman.

Literature Review

UI is a common condition that affects millions of people. Recent studies show that 348 million people worldwide experience, and this number are projected to increase to 423 million by the year 2018 (Irwin et al., 2011). This condition is more common among women. A study identified factors associated with UI by type of incontinence. BMI was associated with stress incontinence; urge incontinence had a strong positive association with diabetes (Waetjen et al., 2007).

A study was done with 719 women, the prevalence of UI was found as 50.3%. The key risk factors for UI were hypertension, diabetes mellitus, multiparity, BMI, and lower education level. And seeking treatment for UI was significantly higher in participants with UUI when compared to those with SUI (Demir et al., 2017). A cross-sectional clinic-based study conducted from October 2016 to January 2017 among 177 women aged 50 years found 49 (27.7%) out of 177 women were having UI. The most prevalent type of UI was stress UI (51.0%), followed by mixed UI (32.7%) and urge UI (16.3%). In bivariate analysis, study participants who were illiterate, having a history of prolonged labor, having a history of gynecological operation, normal vaginal deliveries (>3), diabetic, having chronic cough, having constipation, and having lower urinary tract symptoms had shown significantly greater odds of having UI. Treatment-seeking behavior showed negative correlation with QoL (Biswas et al., 2017). The study was based among the population around Bareilly. Total 464 women were interviewed out of 2860 total inhabitants. Out of 464, 236 females were selected for the study. Twenty-eight women had UI. The overall prevalence of UI in our study was about 12%. There was significant association of increasing age and presence of UI. Various obstetrical factors do contribute to UI. There are many associated factors, which are related to UI among women in different parts of the world. Each set of community has identified different associated factors, which are responsible for UI among women. Seldom literature is available which explains the type of UI and severity of UI and its relationship with risk factors in this community. Hence, the aim of the study is to find out the point prevalence of UI, types, severity, and associated factors among Omani women.

Methodology

Research Design

A descriptive cross-sectional design was used to collect data from 400 women who were attending outpatient department of a referral hospital in Oman. The data was collected from June 2021 to December 2022.

Research Question

(a) What is the point prevalence and type of UI among Omani women?
(b) What are the risk factors that make Omani women susceptible to UI?
(c) What is the relationship between identified types of UI and socio-demographic and obstetrical variables among Omani women?
(d) What is the relationship between severity of UI and socio-demographic and obstetrical variables?

Sample and Sampling Technique

The study participants were Omani women between 20 and 60 years of age who attend the female OPD of SQUH and those who accompany the patient and are willing to participate in the study and ready to sign the written informed consent form. A purposive sampling technique was used to collect the data.

The following were the exclusion criteria: Women who were pregnant and had given birth to a baby within 6 months and women who had neurological impairment.

The formula used to calculate sample size.

$$(N) = (Z_{1-}\alpha)^2 \frac{P(1-p)}{D^2 N} = 1.96^2 \times \frac{0.5\ (1-0.5)}{0.05^2} = 384$$

where: N = the required sample size. z = the z-score corresponding to 95% confidence level (1.96). p = proportion of women attendance in female OPD. $q = 1 - \text{p}$. d = degree of precision in the study.

The confidence level of the researcher in this study was at 95% (hence, $z = 1.96$).

Ethical Consideration

This study obtained ethical clearance from College of Nursing Research and Ethics Committee and Medical Ethics committee of College of Medicine. Each of the participants was asked to sign an informed consent form after determining that they had understood the nature and purpose of the study. The anonymity of participants and confidentiality of their data were upheld and preserved.

Data Collection

Data were collected from women attending the OPD of a hospital in Oman. The tool used to collect data were socio-demographic and obstetrical variables. Women were assessed using the Questionnaire for Urinary Incontinence Diagnosis to determine the type of UI. The test-retest reliabilities of the calculated stress and urge scores were (0.91 [95% CI, 0.87–0.95] and 0.83 [95% CI, 0.75–0.89]). Arabic version of the tool was used to collect the data, and the internal consistency was good, with Cronbach's alpha coefficient of 0.87 (Elserafy et al., 2019).

The severity and the impact of UI in women were assessed using the female urinary tract symptoms module (ICIQ-UI-SF)—A brief and robust measure to evaluate the symptoms and effects of UI. This instrument has a Cronbach's alpha of 0.95. The final ICIQ comprises three scored items and an unscored self-diagnostic item. It allows the assessment of the prevalence, frequency, and perceived cause of UI and its impact on everyday life. The tool provided insight for measuring the symptoms and impact of UI on QOL and information on situations in which incontinence occurred. The ICIQ-UI-SF score is divided into four severity levels. Firstly, the questionnaire score with the QOL dimension include slight (1–5), moderate (6–12), severe (13–18), and very severe (19–21). While the score without a QOL dimension ranged into slight (1–3), moderate (4–5), severe (6–9), and very severe (10–11). Arabic version of the tool was used to collect the data, and the internal consistency was excellent, with Cronbach's alpha coefficient of 0.97 (95% CI: 0.88–0.98) (Al-Shaikh et al., 2013; Elserafy et al., 2019).

Data Analysis

Data was analyzed using SPSS database version 23. Descriptive statistics were used to determine the prevalence and type of UI, and the Chi-square test was used to find the association between UI and sociodemographic and obstetrical variables. In statistical analyses, $p \leq .05$ was considered significant.

Results

Demographic Variables of Omani Women

In our study, 28.25% of the women belonged to the age of 50–59 years. Regarding education, a large number (81.75%) of women completed university degrees. Most (50.5%) of the women were gravida six and above. The majority (33.5%) of the women had 1–3 children. Nearly half (46.5%) of the women delivered a giant baby weighing 2.6–3.5 kg (Table 1).

The point prevalence (per 1000) of UI among Omani women who were between 20 and 60 years was 44%. This

was calculated using the formula (Total number of mothers with UI who attend the female OPD of SQUH/Total number of mothers attended outpatient clinic in a year) × 1000.

= (66/151) × 1000 = 437 per 1000 Omani women population.

Type of UI

In the women who had UI, the majority were having stress UI (41.6%), urge UI (32%), and mixed UI (15.10%).

Severity and Impact of UI

In the women who had UI, the severity of UI, according to the ICIQ-UI-SF scoring, 15.2% of the women had slight, 50.3% had moderate, 33.1% had severe, and only 1.3% had very intense. According to this, most women (83.4%) had moderate to severe UI. Of the impact of UI in everyday life, 46.3% of the women reported it's a great deal, 26.5% said it is a reasonable deal, and 27.2% said it was a mild deal handling UI in everyday life.

Table 1. Socio Demographic and Obstetrical Variables.

Variables	Categories	Frequency	Percentage
Age	30–39	111	27.75
	40–49	106	26.5
	50–59	113	28.25
	<60	70	17.5
Education	University degree	327	81.75
	Up to schooling	58	14.5
	Illiterates	15	3.75
Gravida	1 to 3	37	9.25
	4 to 6	70	17.5
	<6	202	50.5
Number of children	1 to 3	134	33.5
	4 to 6	115	28.75
	<6	47	11.75
Weight of the largest baby delivered	< 2.5 kg	59	14.75
	2.6 to 3.5 kg	186	46.5
	3.6 to 4.5 kg	46	11.5
	>4.5 kg	4	1

Association Between Types of UI and Socio-demographic and Obstetrical Variables

The results indicate that a significant association is found between stress incontinence and the number of living children ($p = .054$), age at marriage ($p = .11$), maternal age at first birth ($p = .109$), and UI during the antenatal period ($p = .001$) (Table 2).

A significant association is found between urge score and clinical variables such as gravida ($p = .047$), age at marriage ($p = .015$), maternal age at first birth ($p = .01$), mode of delivery ($p = .51$), the weight of the most giant baby delivered ($p = .49$), and UI during the postnatal period ($p = .19$) (Table 3).

Our study results identified the association between mixed UI and clinical variables such as gravida ($p = .18$), the number of living children ($p = .039$), age at marriage ($p = .02$), maternal age at first birth ($p = .013$), mode of delivery ($p = .51$), the weight of the largest baby delivered ($p = .31$), UI during antenatal period ($p = .52$), and UI during the postnatal period ($p = .13$) (Table 4).

Association Between Severity of UI and Socio-demographic and Obstetrical Variables

In demographic variables, only age is significantly associated with UI severity ($p = .002$). With obstetrical variables gravida ($p = .2$), para ($p = .35$), age at marriage ($p = .04$), maternal age at first birth ($p = .006$), mode of delivery ($p = .26$), the weight of the largest baby delivered ($p = .07$), menopause ($p = .0$).

Table 2. Association of Stress Urinary Incontinence With Selected Variables.

Variables	Categories	No stress UI	Stress UI	Chi-square
Number of living child	1 to 3	19 (42.2%)	26 (57.8%)	$X^2 = 5.83$
	4 to 6	18 (35.3%)	33 (64.7%)	df = 2
	>6 (grand multipara)	5 (16.1%)	26 (83.9%)	$p = .054$
Age at marriage	<20 years	16 (22.9%)	54 (77.1%)	$X^2 = 4.4$
	21–29 years	25 (39.7%)	38 (60.3%)	df = 2
	30–39 years	1 (33.3%)	2 (66.7%)	$p = .11$
Maternal age at first birth	<20 years	12 (21.8%)	43 (78.2%)	$X^2 = 4.4$
	21–30 years	27 (39.1%)	42 (60.9%)	df = 2
	<31 years	2 (25.0%)	6 (75.0%)	$p = .109$
UI during antenatal	No	35 (48.6%)	37 (51.4%)	$X^2 = 21.6$
	Yes	7 (11.3%)	55 (88.7%)	df = 2
				$p = .001$

Table 3. Association of Urge Urinary Incontinence With Selected Variables.

Variables	Categories	No stress UI	Stress UI	Chi-square
Gravida	1–3	5 (62.5%)	3 (37.5%)	$X^2 = 6.12$
	4–6	15 (68.2%)	7 (31.8%)	df = 2
	<6	42 (41.2%)	60 (58.8%)	$p = .047$
Age at marriage	<20	24 (34.8%)	45 (65.2%)	$X^2 = 8.37$
	21–29 years	37 (59.7%)	25 (40.3%)	df = 2
	30–39 years	1 (33.3%)	2 (66.7%)	$p = .015$
Maternal age at first birth	<20 years	17 (31.5%)	37 (68.5%)	$X^2 = 9.3$
	21–30 years	40 (58.8%)	28 (41.2%)	df = 2
	<31 years	3 (37.5%)	5 (62.5%)	$p = .01$
Delivery mode	SVD	31 (45.6%)	37 (54.4%)	$X^2 = 3.3$
	SVD with episiotomy	12 (60%)	8 (40%)	df = 4
	Assisted delivery	4 (28.6%)	10 (71.4%)	$p = .51$
	Caesarean section	12 (46.2%)	14 (53.8%)	
Weight of largest baby delivered	<2.5 kg	11 (55%)	9 (45%)	$X^2 = 2.38$
	2.6–3.5 kg	37 (48.1%)	40 (51.9%)	df = 3
	3.6–4.5 kg	11 (37.9%)	18 (62.1%)	$p = .49$
	>4.5 kg	0 (0%)	1 (100%)	
UI during postnatal	No	42 (53.2%)	37 (46.8%)	$X^2 = 3.24$
	Yes	20 (37.7%)	33 (62.3%)	df = 2
				$p = .19$

Discussion

UI is a common condition among women, and in most cases, it affects the QOL of women. Our primary aim in this study was to identify the prevalence of UI, types, and severity among the selected population of women attending tertiary care hospitals.

Regarding age, around 1/3 of the population was in late adulthood, 50 to 58 years. This is similar to the prevalence reported among women in Turkey (Tozun et al., 2009) and in the multivariate analysis, which found that the prevalence of UI increases with age and is common up to the age of 75 years with a significant distribution in terms of socio-demographic variables as well (Abufaraj et al., 2021; Amaral et al., 2015; Wu et al., 2010).

The study found a significant statistical association between UI and increasing age, para, gravida, and weight of the largest baby delivered ($p < .5$). Furthermore, similar to as reported by many studies (Minassian et al., 2008; Nygaard et al., 2008; Waetjen et al., 2007; Wu et al., 2010), our findings also reported higher prevalence (50.5%) of UI among grand multigravida with a history of more than six pregnancies. In addition, a higher prevalence was found in women who delivered a baby with 2.5–3.5 kg. Childbearing is identified as an established risk factor demonstrating a significant association between the number of pregnancies, mode of delivery, and weight of the baby. Many other studies also identified an increasing prevalence of UI with increasing age and number of pregnancies (Komeilifar et al., 2017; Liu et al., 2014; Peyrat et al., 2002; Waetjen et al., 2007).

Similar to many studies, stress UI was reported higher (41.6%), followed by urge UI (32%) and mixed UI (15%) (Schreiber Pedersen et al., 2017). Contrary findings were reported by a few studies where MUI and urge incontinence were reported to be higher than SUI (Komeilifar et al., 2017) and UUI more than SUI and MUI (Abufaraj et al., 2021; Sensoy et al., 2013).

Our study findings revealed age significantly contributes to the presence of UI among females, contrary to study results among few cited literature (Ebbesen et al., 2013; Irwin et al., 2006; Jácome et al., 2011). However, well supported by few previous pieces of evidence where age is associated with a higher risk of UI among women of more advanced age (Danforth et al., 2006; Ebbesen et al., 2013). There was no association between the prevalence of UI among females and other socio-demographic variables explored during the research process.

Gravida and parity status, age of marriage, mode of delivery, and weight of the largest baby delivered were among the obstetrical factors significantly associated with UI prevalence. The similar prevalence reported in the study by researchers in Germany and Denmark and an association between UI and parity is well established in a few other studies where several risk factors, including age, parity, mode of delivery, neonate birth weight, gravidity, menopause, overweight, obesity, and some medical comorbidities were associated with higher incidence of UI among females including higher incidence after 37 weeks of gestation (Alling Møller et al., 2000; Dinç, 2018; Ebbesen et al., 2013; Rortveit et al., 2001; Schreiber Pedersen et al., 2017). The findings contributing to association with obstetric

Table 4. Association of Mixed Urinary Incontinence With Selected Variables.

Variables	Categories	No stress UI	Stress UI	Chi-square
Gravida	1–3	6 (75%)	2 (25%)	$X^2 = 3.24$
	4–6	16 (69.6%)	7 (30.4%)	df = 2
	<6	54 (52.4%)	49 (47.6%)	$p = .18$
Number of living child	1 to 3	32 (71.1%)	13 (28.9%)	$X^2 = 6.4$
	4 to 6	29 (56.9%)	22 (43.1%)	df = 2
	>6 (grand multipara)	13 (41.9%)	18 (58.1%)	$p = .039$
Age at marriage	<20	31 (44.3%)	39 (55.7%)	$X^2 = 7.8$
	21–29 years	43 (68.3%)	20 (31.7%)	df = 2
	30–39 years	2 (66.7%)	1 (33.3%)	$p = .02$
Maternal age at first birth	<20 years	23 (41.8%)	32 (58.2%)	$X^2 = 8.7$
	21–30 years	47 (68.1%)	22 (31.9%)	df = 2
	<31 years	4 (50%)	4(50%)	$p = .01$
Delivery mode	SVD	35 (50.7%)	34 (49.3%)	$X^2 = 3.34$
	SVD with episiotomy	15 971.4%)	6(28.6%)	df = 4
	Assisted delivery	7 (50%)	7(50%)	$p = .51$
	Caesarean section	15 (57.7%)	11 (42.3%)	
Weight of largest baby delivered	<2.5 kg	13 (65%)	7 (35%)	$X^2 = 3.55$
	2.6–3.5 kg	46 (58.2%)	33 (41.8%)	df = 3
	3.6–4.5 kg	13 (44.8%)	16 (55.2%)	$p = .31$
	>4.5 kg	0 (0%)	1 9100%)	
UI during antenatal	No	44 (61.1%)	28 (38.9%)	$X^2 = 1.309$
	Yes	32 (51.6%)	30 (48.45)	df = 2
				$p = .5$
UI during postnatal	No	51 (63.8%)	29 (36.3%)	$X^2 = 4.7$
	Yes	25 (46.3%)	29 (53.7%)	df = 2
				$p = .13$

complications like the weight of the baby, and type of delivery, identified as confounding factors, need to be further investigated and statistically supported (Alling Møller et al., 2000).

Among the UI subtypes 41.6% women reported stress UI; 32% presented with symptoms of Urge UI and mixed UI was reported in 15.1%. Findings are partially supported in various available literature where in equal incidence of mixed UI and stress UI was reported (Cameron et al., 2018; de Oliveira et al., 2013; Manonai et al., 2010).

Our findings also mentioned most women, 83.4%, had moderate to severe UI. Similar finding is echoed by Ayten et.al in cross-sectional survey where majority of women reported moderate urine leak and few of them reported leakage few times a day (Dinç, 2018). In terms of impact of UI in everyday life, 46.3% of the women from this study reported that UI is effecting daily life in a great deal, whereas 26.5% said life is effected only at a reasonable level and 27.2% said it was a mild deal to handle UI in everyday life. The QoL among women with UI have been reported variable in multiple related studies, with majority indicating a negative impact on QOL with intensity varying based on type of UI (Amaral et al., 2015). As demonstrated in present study, other studies have shown negative impact of UI on general health of women, with some studies reporting higher psychological impact of UI as well (Reigota et al., 2016).

Presented results indicate high prevalence of UI in the target group. Stress incontinence was the most frequent type of UI identified. Although the contributing factors were differently reported from much available literature, more attention can be given by healthcare professionals to address the risk factors mentioned. Thus, health policies targeted at these combined factors could reduce their prevalence rate and possibly decrease the prevalence of UI.

The main limitation identified in this study is involvement of target population attending only one tertiary unit in the country effecting the generalizability of data reported.

Strength and Limitations

The major strength of the study is the data collected using standardized tool. The study has limitation in the following aspect: the data was collected from only one hospital and through purposive sampling.

Implication for Practice

Primary prevention of UI has received little attention from health care providers. A greater understanding of the associated factors that may predispose women to developing UI would help the health care providers to ensure early diagnosis

and to target those who can benefit from preventive and health promoting intervention.

Conclusion

The prevalence of UI in women is increasing worldwide. Understanding the prevalence of UI in every community and associated factors is essential for the policy makers and healthcare providers to consider the early diagnosis, prevention, health promotion, and management of UI. UI is regarded as a silent disease as many women suffer in silence, thinking it is a normal part of aging. UI significantly decreases the QoL of women in many dimensions, such as physical, social, and sexual. An effort must be taken to prevent UI, make early diagnosis and provide treatment to improve the QoL and prevent complications.

Declaration of Conflicting Interests

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References

Abufaraj, M., Xu, T., Cao, C., Siyam, A., Isleem, U., Massad, A., Soria, F., Shariat, S. F., Sutcliffe, S., & Yang, L. (2021). Prevalence and trends in urinary incontinence among women in the United States, 2005–2018. *American Journal of Obstetrics and Gynecology*, *225*(2), 161–166. https://doi.org/10.1016/j.ajog.2021.03.016

Al Kiyumi, M. H., Al Belushi, Z. I., Jaju, S., & Al Mahrezi, A. M. (2020). Urinary incontinence among Omani women: Prevalence, risk factors and impact on quality of life. *Sultan Qaboos University Medical Journal*, *20*(1), e45–e53. https://doi.org/10.18295/squmj.2020.20.01.007

Alling Møller, L., Lose, G., & Jørgensen, T. (2000). Risk factors for lower urinary tract symptoms in women 40 to 60 years of age. *Obstetrics & Gynecology*, *96*(3), 446–451. https://doi.org/10.1016/S0029-7844(00)00915-7

Al-Shaikh, G., Al-Badr, A., Al Maarik, A., Cotterill, N., & Al-Mandeel, H. M. (2013). Reliability of Arabic ICIQ-UI short form in Saudi Arabia. *Urology Annals*, *5*(1), 34–38. https://doi.org/10.4103/0974-7796.106964

Alshehri, S. Z., Abumilha, A. K., Amer, K. A., Aldosari, A. A., Shawkhan, R. A., Alasmari, K. A., & Sabrah, T. A. (2022). Patterns of urinary incontinence among women in Asir Region, Saudi Arabia. *Cureus*, *14*(1), e21628. https://doi.org/10.7759/cureus.21628

Amaral, M. O. P., Coutinho, E. C., Nelas, P. A. A. B., Chaves, C. M. B., & Duarte, J. C. (2015). Risk factors associated with urinary incontinence in Portugal and the quality of life of affected women. *International Journal of Gynecology & Obstetrics*, *131*(1), 82–86. https://doi.org/10.1016/j.ijgo.2015.03.041

Aoki, Y., Brown, H. W., Brubaker, L., Cornu, J. N., Daly, J. O., & Cartwright, R. (2017). Urinary incontinence in women. *Nature Reviews Disease Primers*, *3*, 17042. https://doi.org/10.1038/nrdp.2017.42

Biswas, B., Bhattacharyya, A., Dasgupta, A., Karmakar, A., Mallick, N., & Sembiah, S. (2017). Urinary incontinence, its risk factors, and quality of life: A study among women aged 50 years and above in a rural health facility of West Bengal. *Journal of Mid-Life Health*, *8*(3), 130–136. https://doi.org/10.4103/jmh.JMH_62_17

Cameron, A. P., Smith, A. R., Lai, H. H., Bradley, C. S., Liu, A. B., Merion, R. M., … N. Y. Siddiqui (2018). Bowel function, sexual function, and symptoms of pelvic organ prolapse in women with and without urinary incontinence. *Neurourology and Urodynamics*, *37*(8), 2586–2596. https://doi.org/10.1002/nau.23587

Danforth, K. N., Townsend, M. K., Lifford, K., Curhan, G. C., Resnick, N. M., & Grodstein, F. (2006). Risk factors for urinary incontinence among middle-aged women. *American Journal of Obstetrics and Gynecology*, *194*(2), 339–345. https://doi.org/10.1016/j.ajog.2005.07.051

Demir, O., Sen, V., Irer, B., Bozkurt, O., & Esen, A. (2017). Prevalence and possible risk factors for urinary incontinence: A cohort study in the city of Izmir. *Urologia Internationalis*, *99*(1), 84–90. https://doi.org/10.1159/000466705

de Oliveira, C., Seleme, M., Cansi, P. F., Consentino, R. F., Kumakura, F. Y., Moreira, G. A., & Berghmans, B. (2013). Urinary incontinence in pregnant women and its relation with socio-demographic variables and quality of life. *Revista da Associação Médica Brasileira (English Edition)*, *59*(5), 460–466. https://doi.org/10.1016/S2255-4823(13)70505-8

Dinç, A. (2018). Prevalence of urinary incontinence during pregnancy and associated risk factors. *Lower Urinary Tract Symptoms*, *10*(3), 303–307. https://doi.org/10.1111/luts.12182

Ebbesen, M. H., Hunskaar, S., Rortveit, G., & Hannestad, Y. S. (2013). Prevalence, incidence and remission of urinary incontinence in women: Longitudinal data from the Norwegian HUNT study (EPINCONT). *BMC Urology*, *13*, 27. https://doi.org/10.1186/1471-2490-13-27

Elserafy, F. A., Shaheen, H. M., Khalil, N. A., & Abdelrahman, H. A. M. (2019). Urinary incontinence among elderly women attending a rural family health center in Gharbiya Governorate, Egypt. *Menoufia Medical Journal*, *32*(3), 955. https://doi.org/10.4103/mmj.mmj_701_17

Ghafouri, A., Alnaimi, A. R., Alhothi, H. M., Alroubi, I., Alrayashi, M., Molhim, N. A., & Shokeir, A. A. (2014). Urinary incontinence in Qatar: A study of the prevalence, risk factors and impact on quality of life. *Arab Journal of Urology*, *12*(4), 269–274. https://doi.org/10.1016/j.aju.2014.08.002

Haylen, B. T., de Ridder, D., Freeman, R. M., Swift, S. E., Berghmans, B., Lee, J., Monga, A., Petri, E., Rizk, D. E., Sand, P. K., & Schaer, G. NInternational Urogynecological

Association, & International Continence Society (2010). An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. *Neurourology and Urodynamics*, *29*(1), 4–20. https://doi.org/10.1002/nau.20798

Irwin, D. E., Kopp, Z. S., Agatep, B., Milsom, I., & Abrams, P. (2011). Worldwide prevalence estimates of lower urinary tract symptoms, overactive bladder, urinary incontinence and bladder outlet obstruction. *BJU International*, *108*(7), 1132–1138. https://doi.org/10.1111/j.1464-410X.2010.09993.x

Irwin, D. E., Milsom, I., Hunskaar, S., Reilly, K., Kopp, Z., Herschorn, S., Coyne, K., Kelleher, C., Hampel, C., Artibani, W., & Abrams, P. (2006). Population-based survey of urinary incontinence, overactive bladder, and other lower urinary tract symptoms in five countries: Results of the EPIC study. *European Urology*, *50*(6), 1306–1315. https://doi.org/10.1016/j.eururo.2006.09.019

Jácome, C., Oliveira, D., Marques, A., & Sá-Couto, P. (2011). Prevalence and impact of urinary incontinence among female athletes. *International Journal of Gynecology & Obstetrics*, *114*(1), 60–63. https://doi.org/10.1016/j.ijgo.2011.02.004

Komeilifar, R. M., Javadifar, N. P., Afshari, P. M., Haghighizade, M. H. M., & Honarmandpour, A. M. (2017). The prevalence, subtypes and obstetric risk factors of urinary incontinence in reproductive age women referred to community health care centers of Dezful, Iran- 2015. *International Journal of Community Based Nursing and Midwifery*, *5*(3), 275–283.

Laganà, L., Bloom, D. W., & Ainsworth, A. (2014). Urinary incontinence: its assessment and relationship to depression among community-dwelling multiethnic older women. *Thescientificworld journal*, *2014*, https://doi.org/10.1155/2014/708564

Lee, U. J., Feinstein, L., Ward, J. B., Matlaga, B. R., Fwu, C. W., Bavendam, T., Kirkali, Z., Kobashi, K. C., & Urologic Diseases in America Project (2020). National trends in the surgical management of urinary incontinence among insured women, 2004 to 2013: The urologic diseases in America project. *Journal of Urology*, *203*(2), 365–371. https://doi.org/10.1097/JU.0000000000000569

Liu, B., Wang, L., Huang, S. S., Wu, Q., & Wu, D. L. (2014). Prevalence and risk factors of urinary incontinence among Chinese women in Shanghai. *International Journal of Clinical and Experimental Medicine*, *7*(3), 686–696. https://doi.org/10.1016/j.ijgo.2015.03.041

Manonai, J., Wattanayingcharoenchai, R., Sarit-Apirak, S., Vannatim, N., & Chittacharoen, A. (2010). Prevalence and risk factors of anorectal dysfunction in women with urinary incontinence. *Archives of Gynecology and Obstetrics*, *281*(6), 1003–1007. https://doi.org/10.1007/s00404-009-1223-9

Minassian, V. A., Stewart, W. F., & Wood, G. C. (2008). Urinary incontinence in women: Variation in prevalence estimates and risk factors. *Obstetrics & Gynecology*, *111*(2 Pt 1), 324–331. https://doi.org/10.1097/01.Aog.0000267220.48987.17

Nygaard, I., Barber, M. D., Burgio, K. L., Kenton, K., Meikle, S., Schaffer, J., Spino, C., Whitehead, W. E., Wu, J., & Brody, D. J (2008). Prevalence of symptomatic pelvic floor disorders in US women. *Jama*, *300*(11), 1311–1316. https://doi.org/10.1001/jama.300.11.1311

Patel, U. J., Godecker, A. L., Giles, D. L., & Brown, H. W. (2022). Updated prevalence of urinary incontinence in women: 2015–2018 national population-based survey data. *Female Pelvic Medicine & Reconstructive Surgery*, *28*(4), 181–187. https://doi.org/10.1097/SPV.0000000000001127

Peyrat, L., Haillot, O., Bruyere, F., Boutin, J. M., Bertrand, P., & Lanson, Y. (2002). Prevalence and risk factors of urinary incontinence in young and middle-aged women. *BJU International*, *89*(1), 61–66. https://doi.org/10.1046/j.1464-4096.2001.01813.x

Reigota, R. B., Pedro, A. O., de Souza Santos Machado, V., Costa-Paiva, L., & Pinto-Neto, A. M. (2016). Prevalence of urinary incontinence and its association with multimorbidity in women aged 50 years or older: A population-based study. *Neurourology and Urodynamics*, *35*(1), 62–68. https://doi.org/10.1002/nau.22679

Rortveit, G., Hannestad, Y. S., Daltveit, A. K., & Hunskaar, S. (2001). Age- and type-dependent effects of parity on urinary incontinence: The Norwegian EPINCONT study. *Obstetrics & Gynecology*, *98*(6), 1004–1010. https://doi.org/10.1016/s0029-7844(01)01566-6

Schreiber Pedersen, L., Lose, G., Høybye, M. T., Elsner, S., Waldmann, A., & Rudnicki, M. (2017). Prevalence of urinary incontinence among women and analysis of potential risk factors in Germany and Denmark. *Acta Obstetricia et Gynecologica Scandinavica*, *96*(8), 939–948. https://doi.org/10.1111/aogs.13149

Sensoy, N., Dogan, N., Ozek, B., & Karaaslan, L. (2013). Urinary incontinence in women: Prevalence rates, risk factors and impact on quality of life. *Pakistan Journal of Medical Sciences*, *29*(3), 818–822. https://doi.org/10.12669/pjms.293.3404

Seshan, V., AlKhasawneh, E., & Al Hashmi, I. H. (2016). Risk factors of urinary incontinence in women: A literature review. *International Journal of Urological Nursing*, *10*(3), 118–126. https://doi.org/10.1111/ijun.12107

Seshan, V., & Muliira, J. K. (2013). Self-reported urinary incontinence and factors associated with symptom severity in community dwelling adult women: Implications for women's health promotion. *BMC Women's Health*, *13*, 16. https://doi.org/10.1186/1472-6874-13-16

Steibliene, V., Aniuliene, R., Aniulis, P., Raskauskiene, N., & Adomaitiene, V. (2020). Affective symptoms and health-related quality of life among women with stress urinary incontinence: Cross-sectional study. *Neuropsychiatric Disease and Treatment*, *16*, 535–544. https://doi.org/10.2147/ndt.S236234

Stewart, W. F., Hirsh, A. G., Kirchner, H. L., Clarke, D. N., Litchtenfeld, M. J., & Minassian, V. A. (2014). Urinary incontinence incidence: Quantitative meta-analysis of factors that explain variation. *Journal of Urology*, *191*(4), 996–1002. https://doi.org/10.1016/j.juro.2013.10.050

Tozun, M., Ayranci, U., & Unsal, A. (2009). Prevalence of urinary incontinence among women and its impact on quality of life in a semirural area of Western Turkey. *Gynecologic and Obstetric Investigation*, *67*(4), 241–249. https://doi.org/10.1159/000209310

Waetjen, L. E., Liao, S., Johnson, W. O., Sampselle, C. M., Sternfield, B., Harlow, S. D., & Gold, E. B. (2007). Factors associated with prevalent and incident urinary incontinence in a cohort of midlife women: A longitudinal analysis of data: Study of women's health across the nation. *American Journal of Epidemiology*, *165*(3), 309–318. https://doi.org/10.1093/aje/kwk018

Wu, J. M., Stinnett, S., Jackson, R. A., Jacoby, A., Learman, L. A., & Kuppermann, M. (2010). Prevalence and incidence of urinary incontinence in a diverse population of women with noncancerous gynecologic conditions. *Female Pelvic Medicine & Reconstructive Surgery*, *16*(5), 284–289. https://doi.org/10.1097/SPV.0b013e3181ee6864