

Urinary Incontinence Prevalence in Women in Morocco

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Authors' contributions

This work was carried out in collaboration among all authors. Conception and design of study done by authors NO, NB, SEF and NT. Generation, collection, assembly, analysis and/or interpretation of data done by authors NO, NQ, PC, SBM, IEH, BJD, IC, MM, SEF and NT. Drafting or revision of the manuscript done by authors NO, AF, SEF and NT. Authors NO, NB, AF, NQ, PC, SBM, IEH, BJD, IC, MM, SEF and NT read and approved the final manuscript.

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ABSTRACT

Background: Urinary incontinence (UI) is a common health problem, especially in older women. It has a major impact on the quality of life, physical and psychological well-being of patients.

Aims: We aimed to determine the prevalence of UI and identify its risk factors in the Fez-Meknes region, Morocco.

Study Design and Methodology: A cross-sectional study was conducted among adult female outpatient in primary healthcare facilities in fez during 2019. Data was collected using anonymous questionnaire. UI was defined according to international guidelines. Univariate analyses were used to assess associations of UI with demographic characteristics and risk factors. Multivariate logistic regression was used to adjust for potential confounding.

Results: About 189 women were included, the average age was 39.26 years (SD = 14.40 years). Prevalence of UI was 32.8%. It increased significantly with age (65% of women over 60 years of age were incontinent compared to 12% of women under 30 years of age(P=.001)), the high BMI (P =.002), and in women exposed to passive smoking (P =.005). The history of vaginal deliveries

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($P < .0001$), instrumental deliveries ($P = .001$), and menopause ($P < .0001$) were also significantly associated with the occurrence of UI.

Factors remaining significantly associated with UI in multivariate analysis were the age (OR=1.09; (1.04-1.13)), the history of abdominal surgery (OR=4.7; (1.55-14.3)), the exposition to the passive smoking (OR=4.06; (1.08-15.29)), and the history of tool delivery (OR=3.8 (1.03-14.4)).

Conclusion: Our results show a significant frequency of urinary incontinence in women in our region, which suggests the implementation of its systematic screening in general practice consultation in women at risk.

Keywords: Urinary incontinence; female; prevalence; risk factors.

1. INTRODUCTION

The definition of urinary incontinence (UI) varies from "some urine loss in the last 12 months regardless of its importance" [1], to the International Continence Society's (ICS) definition (1981) as an involuntary leak of urine or urine leakage observed during examination [2].

Urinary incontinence should be defined by its specific characteristics such as type, frequency, severity, triggers factors, associated symptoms, social and hygienic impact, impact on quality of life, the treatment measures already undertaken, and the treatment request [3,4].

There are three types of urinary incontinence, which are:

- Stress urinary incontinence (SUI), characterized by involuntary loss of urine during efforts that increase abdominal pressure [5].
- Urge urinary incontinence (UUI) is manifested by leakage of urine occurring outside of any effort, and which is preceded by a sudden urge to urinate, with an increase in urinary frequency both day and night [5]. It results from uninhibited bladder contractions, and incomplete emptying of the bladder. In most women, urge incontinence is idiopathic [5]. However, it is common in women with urological, neurological, or psychogenic conditions. [4,6]
- Many women with incontinence experience coexisting stress and urge symptoms usually called mixed urinary incontinence (MUI). [4,5].

Urinary incontinence has a significant impact on the quality of life [7]. The symptoms can seriously alter the different activities, thus having a significant impact on the physical, psychological

and social well-being of the affected persons. It also represents significant expenses in terms of care [7,8].

Urinary incontinence in women is a common pathology that has been studied by several epidemiological studies around the world. Many factors have been associated with an increased risk of it. The main ones are age, overweight, and factors related to pregnancy and childbirth [3]. Its prevalence varies in the literature from 4 to 57% [7]. However, it's continued to be underestimated because, it is a bothersome symptom of consultation for patients [9,10]. Thus, only a quarter of affected women seek care, and less than half of them receive treatment because of their discomfort, lack of knowledge, or misunderstanding of treatment [5].

In Morocco, the prevalence of urinary incontinence in women ranged from 14% [10] to 27% [11]. In view of the change in the structure of the Moroccan population (progressive aging [12], decreased fertility [13]), as well as the change in eating habits and the drugs and toxins consumption), and because of the previous studies in our country concerned limited population, or a particular age group, an update of the data seems necessary.

1.1 Objective

We aimed to determine the prevalence of UI and identify associated risk factors in our region.

2. MATERIALS AND METHODS

2.1 Design

The present study was designed as a cross-sectional, and was conducted in the primary healthcare facilities of Fez during 2019.

2.2 Sampling

Population-based study was Outpatient female subjects, over the age of 18 years, seen in consultation.

2.3 Ethical Consideration

The approval of the Fez University Hospital Ethics Committee, and the agreement of the Ministry of Health were obtained. Those who agreed to participate were asked to sign a written consent form. Anonymity and confidentiality were respected for all participants.

2.4 Tools and Data Collection

The data collection was carried out in a standardized way using an anonymous questionnaire concerning Socio-demographic and socio-economic data, physical activity, alcoholic status, smoking status, surgical history, medical history, and familial history.

We defined UI as any involuntary leakage of urine during the past 12 months regardless of its characteristics in terms of duration, frequency, or quantity. This information was self-reported by the participants, and was not validated by any objective measurements.

A severity index of UI was calculated based on the Sandvik formula [14], by multiplying the results of frequency question and urinary loss quantity question. This score defines three stages of UI: 1-2 = slight UI; 3-4 = moderate UI; 6-8 = severe UI.

Based on their body mass index (BMI), respondents were grouped either as underweight (BMI < 18.5 kg/m²), normal (BMI between 18.5 and 25 kg/m²), overweight (BMI between 25 and 30 kg/m²), or obese (BMI > 30 kg/m²) in accordance with the WHO guidelines [15].

The profession was defined by the following categories: full-time, part-time, student, disabled, unemployed, housewife, and retired.

2.5 Data Analysis

Descriptive statistics were used to characterize the respondent's demographic and clinical characteristics and the prevalence of UI. Frequencies were used for qualitative variables. Means and standard deviations were used for quantitative variables. The classical parametric tests (Chi2 test, Student's test) in univariate analysis were used to test associations between urinary incontinence and the explanatory variables.

Multivariate analysis by logistic regression was used to determine possible factors associated

with the occurrence of UI, adjusting for third party factors and confounding factors. The linearity of the variable "Age" was verified, which allowed introducing it into the multivariate model as a quantitative variable. All other variables were introduced as qualitative variables. The threshold for inclusion in the logistic regression model was set at 10%. The significant association was presented using odd ratio and its confidence interval.

The threshold value of significance was set at 0.05. Statistical analyses were performed by using EPIinfo7.

3. RESULTS AND DISCUSSION

A total of 189 women with a mean age of 39.26 years (SD = 14.40 years) (47.79 years (SD = 12.88 years) in women with incontinence versus 35.09 years (SD = 13.26 years) among continent women) were enrolled in the study. About 32.8% of the women reported that they had involuntary loss of urine. The prevalence of incontinence increased with increasing age (Fig. 1).

About one third of women was academics (36%), one third was illiterates (29%), and about two-thirds of them were married (60%) and housewives (64%). 57% of participants were overweight or obese. Baseline data are presented in Table 1.

About one-third (28.7%) of women were nulliparous, and two-thirds (64.7%) of them had given birth delivered by vaginal way at least twice. About 24%, 38%, 16% and 42% of women were successively candidates for a cesarean section, an episiotomy, an instrumental delivery, and a delivery of a baby macrosomia at least once. Thirty percent of women were menopausal.

Around 20% of the women had abdominal surgery, 10% had a history of constipation, 10% had recurrent urinary tract infections, and 7% had a history of childhood enuresis.

The family history of UI was found in 20% of women. It was found in 52.6% of them in the mother, and in 23.7% in the sister.

Around 33% of the interviewed women had urinary leakage. About two-thirds (68%) of them had this trouble during the last 5 years. 16% of women had stress UI, 19% had urge UI, and 64% had mixed UI. In about two-thirds (67%) of

the cases, the UI was isolated, and in half of the cases, it was a slight UI. 20% of women had already consulted for their trouble, and about 63% were willing to consult. forty percent of

women believed that UI is normal with age, and about half of them did not know about UI treatment (Table 2).

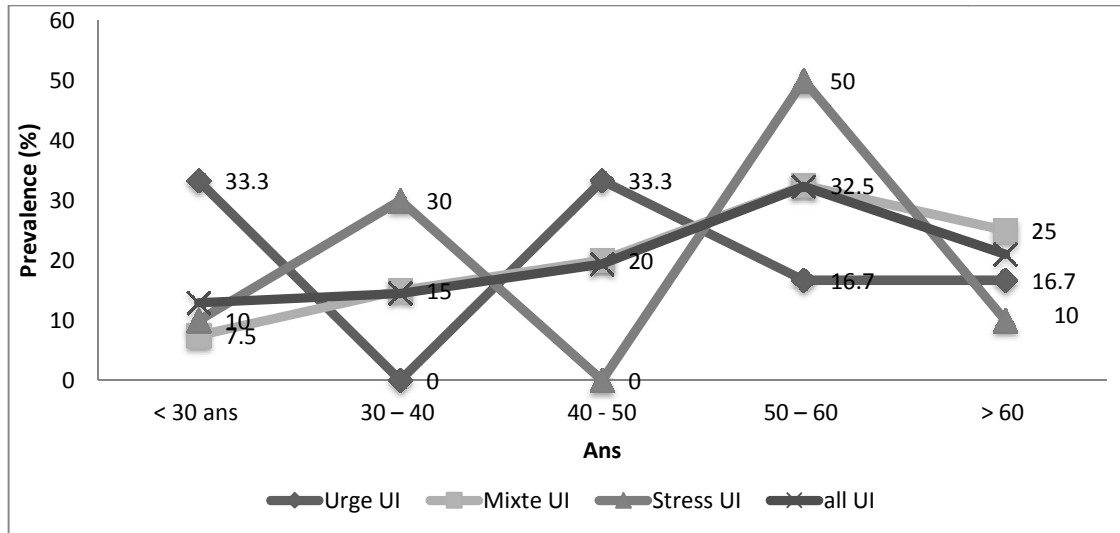


Fig. 1. Prevalence of urinary incontinence by age group

Table 1. Baseline characteristics of the study group

	Respondents (n)	%
Age		
< 30 years	66	34,90
30 – 40	34	18
40 - 50	28	14,8
50 – 60	41	21,7
> 60	20	10,6
Education		
Illiterate	55	29,1
Primary	34	18
Secondary	32	16,9
Academic	68	36
Marital status		
Single	53	28
Divorced	9	4,8
Married	113	59,8
Widow	14	7,4
Current employment status		
Working full time	28	17,2
Student	29	17,8
housewife	105	64,4
Retired	1	0,6
BMI (kg/m2)		
thinness	4	2,2
Healthy weight	73	40,6
Overweight	63	35
obesity	40	22,2

Table 1. Amount, frequency, severity, type, and duration of urinary incontinence, impact of incontinence, having consulted a doctor about incontinence

	Respondent (n)	Percentage (%)
Urinary leakage	62	32,8
Seniority urinary incontinence		
0-5 years	41	68,3
5-10 years	13	21,7
More than 10 years	6	10,0
Types of urinary incontinence		
Urge UI	12	19,4
Mixed UI	40	64,5
Stress UI	10	16,1
Associated clinical signs		
Isolated UI	50	66,7
pollakiuria	10	5,3
Dysuria	10	5,3
Hematuria	1	0,5
urinary burning	3	1,6
Severity of UI		
Slight UI	33	50,0
moderate UI	24	36,4
severe UI	9	13,6
Quality of life		
permanent wearing of sanitary pads	12	15,4
Frequent change of underwear	41	52,6
Previous Consultation for UI	13	20,3
Be ready to consult	38	63,3
Belief that UI is normal with Age	58	42,6
Do you think there a treatment for UI	65	47,8

Statistical analysis has shown that the risk of having urinary incontinence of any type increases with age ($P = .001$) (Table 3). Fig. 1 shows that urge UI decreases with age, it diminish from 50% in women under 30 years to 15.4% in women beyond 60 years. It was also noted that from about age of 30, mixed UI was the most common in our population study. About 50% of women suffering from stress UI are between 50 and 60 years old. However, no statistically significant association was found between UI type and age ($P = .06$) (not shown in the table).

The severity level of the UI was not statistically associated with its type ($P = .52$) nor with the age of the woman ($P = .23$) (not shown in the table).

The risk of having urinary incontinence increases among illiterate women ($P = .009$), married women, or women who have been married ($P = .001$), housewives, or women working full-time ($P = .008$), and obese or overweight women ($P = .001$) (Table 3).

It has also been shown that the risk of having urinary incontinence increases after the first

pregnancy, and continues to increase when the number of parity increases ($P = .001$). Vaginal delivery ($P = .001$), instrumental delivery ($P = .001$), episiotomy ($P = .001$), giving birth to a baby macrosoma ($P = .02$), and menopause ($P = .001$), are also risk factors for UI in women. However, no significant association was found between history of Caesarean section ($P = .24$), or perineal rehabilitation ($P = .29$) and UI occurrence (Table 3).

Immobility ($P = 0.04$), diabetes ($P < 0.0001$), history of obesity ($P = 0.02$), passive smoking ($P = 0.003$), gymnastics practice ($P = 0.03$), recurrent urinary tract infections ($P = 0.01$), history of abdominal surgery ($P = 0.01$), family history of UI ($P = 0.03$), and tea consumption ($P = 0.02$) seem to contribute to the development of UI (Table 4). However, the history of constipation ($P = 0.43$), stroke ($P = 1$), confusional syndrome ($P = 0.32$), chronic cough ($P = 1$), and infantile enuresis ($P = 0.43$) do not appear to be associated with the risk of developing an UI, as well as for basketball practice ($P = 0.21$), the medicine's consumption (antidepressant ($P = 1$), antipsychotic ($P = 1$), sedative ($P = 0.1$)), and

estrogen ($P = 0.33$)), or certain beverages (coffee ($P = 0.42$), soft drinks ($P = 0.3$)) known to promote diuresis) (not shown in the table).

Previous consultation for urinary incontinence was common in women with stress UI ($P = 0.011$). However, the age ($P = 0.85$), the education level ($P = 0.71$), and the severity of UI ($P = 0.59$) were not statistically associated with seeking care. (Not shown in the table)

The final model of logistic regression showed that, adjusted to the other variables, only the age, the history of instrumental deliveries, or abdominal surgery, and passive exposure to tobacco are significantly related to the risk of developing an UI (Table 5).

The history of tool delivery increases of urinary incontinence by 3 times. This risk increases by 34 times after the second instrumental delivery. Women with a history of abdominal surgery, or who have been exposed to passive smoking were about 4 times as likely to report UI as those without this risk factors. Also, an additional year of age increases the risk of urinary incontinence by 1.09 times.

In this cross-sectional study, we demonstrate that 33% of the women interviewed had urinary leakage. In the literature, the prevalence is frequently between 25% and 45% [3,16-21]. The differing prevalence estimates in studies are caused by study populations selected on different criteria and different survey procedures, but most important by the use of different definitions of urinary incontinence [3,8]. In our study we used a low threshold for identifying the women as incontinent. Urinary incontinence (UI) was defined, as in that of Diokno [1], by the occurrence of at least one episode of involuntary urine leakage during the last twelve months, whatever its importance, or frequency.

In our study, stress UI was found in 16% of women, unlike what we found in the majority of literature studies, which demonstrated that stress UI was most frequently found [10-11,16-22]. It generally ranged from 80% [23] to 30% [19]. Mixed UI was the most common and found in 64% of women of our population. In the literature, it ranged between 14.5% [10] and 36% [16,24]. while 19% had an UUI in our study, that joined the literature data, which ranged UUI from about 10% [16] to 45% [23].

Various UI risk factors have been identified in the literature, the most frequent being the age (17).

We noted in our study, as well as many other studies [3,5,7,8,11,16,18,23,25], that UI prevalence increased with age. However, this increase in the risk of UI with age decreases or disappears in the sixties [3,11,17].

In our study, 50% of the women with stress UI were aged between 50 and 60 years old. Similarly, a study conducted in Casablanca [11], as well as others [26,27], have shown that stress UI increases with age, and is frequently encountered beyond the age of 50 [11]. This finding joins the physiopathology of this UI type. However, and contrary to our findings, recent reports from studies of young women indicate that stress UI is more represented in women younger than 50 years old [16,17,21,23]. In Marrakech, a study conducted in 2009 in women of under 40 years of age, indicated a stress UI in 54.2% of women [10].

The mixed UI frequency increased between the ages of 30 and 60 years in our study, as well as in the literature [11,16]. According to other studies, it showed peaks beyond 70 years [17,21].

Urge UI in our context decreased with age. It went from 50% among women under 30 years, to 15.4% of cases among women over 60 years. Literature data remain variable between those showing that the most affected age group is under 30 years [10,11,16], and those who found UUI more common in elderly women [16,17, 21,27].

Most studies [17,18,20,21,23,28-30], as well as ours, that treating the relationship between BMI and the occurrence of UI, have shown that obesity and overweight are risk factors for UI. The data of cohort studies confirmed that the causal relationship with overweight and obesity, demonstrating definite temporality, and a linear relationship between BMI and UI [8,26,31].

Gynecological risk factors, in particular parity, vaginal delivery, instrumental delivery, macrosomia, are also identified among the most incriminated risk factors in the occurrence of UI.

For several authors [7,11,19,21,25,32-34,35], as well as in our study, parity is a factor favouring the UI; since, there is less cases among nulliparous than among women with at least one child. However, in the long term, studies [27,36] have not shown a significant association between parity and UI.

Table 3. Comparison of risk factors for continent compared to incontinent women

	Incontinent women n(%)	Continent women n(%)	P -value
Age			.001
< 30 years	8 (12.1)	58(87.9)	
30 – 40	9 (26.5)	25(73.5)	
40 - 50	12 (42.9)	16(57.1)	
50 – 60	20 (48.8)	21(51.2)	
> 60 years	13 (65.0)	7(35.0)	
Education			.009
Illiterate	27 (49.1)	28(50.9)	
primary School	12 (35.3)	22(64.7)	
High School	9 (28.1)	23(71.9)	
Academic	14 (20.6)	54(79.4)	
Marital status			.001
Single	5 (9.4)	48 (90.6)	
Other	57 (41.9)	79 (58.1)	
Current employment status			.01
Working full time	10 (35.7)	18 (64.3)	
Student	2 (6.9)	27 (93.1)	
Housewife	37 (35.2)	68 (64.8)	
Retired	0 (0)	1 (0.9)	
BMI (kg/m2)			.002
thinness	0 (0)	4(100)	
Healthy weight	15 (20.5)	58(79.5)	
Overweight	23 (36.5)	40(63.5)	
obesity	21 (52.5)	19(47.5)	
Delivery parameters			
Parity's number			.001
0	4 (7.8)	47(92.2)	
1	7 (41.2)	10(58.8)	
2+	48 (43.6)	62(56.4)	

	Incontinent women n(%)	Continent women n(%)	P -value
Number of vaginal delivery			.001
0	2 (4.9)	39(95.1)	
1	4 (33.3)	8(66.7)	
2+	47 (48.5)	50(51.5)	
Number of cesarean section			.24
0	31 (29.5)	74(70.5)	
1	10 (22.7)	11(52.4)	
2+	3 (25.0)	9(75.0)	
Number of Tool delivery			.001
0	27 (25.7)	78(74.3)	
1	8 (57.1)	6(42.9)	
2+	5 (83.3)	1(16.7)	
Number of Episiotomy			.001
0	19 (23.2)	63(76.8)	
1	7 (35.0)	13(65.0)	
2+	18 (60.0)	12(40.0)	
Number of babies macrosomas (higher birthweight)			0.01
0	21 (26.2)	59 (73.8)	
1+	27 (46.6)	31 (53.4)	
Perineal rehabilitation	2 (3.6)	1(1)	.29
Menopause	27 (48.2)	20(19.6)	.001

Table 4. Comparison of risk factors for continent compared to incontinent women (part 2)

	Incontinent women n(%)	Continent women n(%)	P -value
Immobility	4 (6.5)	1(0.8)	.04
Diabetes	25 (40.3)	19(15)	.001
Repetitive urinary tract infections	11 (17.7)	7(38.9)	.01
Surgical history			
Abdominal surgery	17 (28.8)	16 (12.9)	
Family history			
Family history of UI	18 (30.5)	20(16)	.03
Lifestyle			
Gymnastic	1 (5.9)	12(35.3)	.03
Obesity	21 (34.4)	23(19.2)	.02
Active smoking			
Ex-smoker	0 (0)	4 (3.6)	
current smoker	0 (0)	3 (2.7)	
Non-smoker	56 (100)	103 (93.6)	
Passive Smoking	19 (30.6)	17 (13.4)	.005

Table 5. Multiple regression analysis of the association between urinary incontinence AND significant risk factors. Values are expressed as OR (95 CI)

Independent risk factors	OR (IC à 95)	P -value
Age	1.09 (1.04-1.13)	.001
Number of Tool delivery=0	1	.001
Number of Tool delivery=1	3.8 (1.03-14.4)	
Number of Tool delivery≥2	34.6 (3.16-379.22)	
Abdominal surgery=no	1	.006
Abdominal surgery=Yes	4.7 (1.55-14.3)	
Passive Smoking=no	1	.039
Passive Smoking=Yes	4.06 (1.08-15.29)	

Our study and several others [17,18,21,25-27,37,38], who have studied the effect of delivery mode on the risk of urinary incontinence, converge to associate vaginal delivery with an increased risk of having a UI, compared with caesarean delivery. The protective effect of scheduled cesarean section remains controversial. According to Gyhagen [25] and Press [34], it reduces the risk of having a UI by 30%, and reduces the risk of having a severe UI by 52%.

It has also been shown in the literature, as well as in our study, that the use of obstetrical instruments during delivery [11,26,34], given of a high birth weight both for women who gave birth vaginally or by caesarean section [11, 22,26,29], and menopause [11,21,19] increases the risk of having an UI.

The use of episiotomy has been shown by some studies [26,30], as well as ours, to be a risk factor for UI. However, for many other authors [29,37,39,40], episiotomy does not appear to

have any impact on the onset or persistence of urinary incontinence.

We also confirm, by univariate analysis that immobility, diabetes, obesity, passive smoking, gymnastics practice, recurrent urinary tract infections, history of abdominal surgery, family history of UI, and tea consumption seem to contribute to the development of UI.

However, the final model of logistic regression showed that, adjusted to the other variables, only the age, the history of instrumental deliveries, or abdominal surgery, and passive exposure to tobacco are significantly related to the risk of developing a UI.

Despite the high prevalence of UI, and the safety and efficacy in the medium term of the most common treatments in women. UI remains under diagnosed and undertreated [5]. Only a quarter of the women affected [5,10, 16,21], or even less [11,19] were seeking care, and less than half of them were receiving treatment [5]. The prevalence of consultant

women increases with the severity and impact on the quality of life [16]. About half of the women interviewed in the literature [10] or even more [11] were willing to consult and undertake clinical or para-clinical examinations. Older age and illiteracy were described in the literature as two essential factors for the neglect of urinary leakage [11]. In our study, none of these factors could be shown to be associated with seeking care for this disorder. However, consultation was more common among women suffering from stress UI.

4. CONCLUSION

Urinary incontinence is common in women. It is a real disease physically and socially disabling. Although there is little care seeking, despite many effective and satisfactory treatment options. This may be due to the perception of the disorder as a normal evolution with age, or the lack of knowledge of the existence of effective treatments for this condition, or because of the "taboo" nature of this trouble.

For all these reasons, and in order to limit the psychological and physical consequences, urinary incontinence deserves to be sought in general medicine. Rigorous diagnostic conduct and well thought out care are needed.

Taking into account already known risk factors, preventive actions must also be implemented. Information and awareness campaigns should encourage women to consult and thus make it possible for them to benefit from the most effective therapeutic options, and to reduce the medico-social and economic costs of this problem.

It would still be necessary to standardize the definitions of urinary incontinence, survey methods and evaluation criteria if we want to be able to compare different studies conducted in this direction.

CONSENT

The written informed consent was obtained from study participants. Participants' confidentiality was kept.

ETHICAL APPROVAL

This study was approved by the Fez University Hospital Ethics committee (we haven't an approval number).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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