

## Abstract

**Objective:** The purpose of our study was to examine the prevalence, quality of life, severity and different types of urinary incontinence in overweight and obese women using an internationally validated questionnaire form. **Methods:** We conducted a cross-sectional study of 1351 consecutive patients, who were recruited between June 2021 and May 2022. Validated survey was used to assess the frequency, amount of leakage, impact of UI on QOL, severity and types of UI. **Results:** The mean age of the patients was 39.7±14.2 years with less than a half in the 19–35-year age group (46.9 %) and 65% were overweight or obese. The overall prevalence of UI was 61.2%. Overweight and obesity accounted to 70.2% of patients with mild to very severe UI. The risk estimates to have UI were 1.84 in overweight and 5.4 in obese group. The risk estimate for severe and very severe UI was 2.33 in overweight and 10.34 in obese group. When considering all subtypes, 67.9% of women with overweight and obesity had any of the subtypes-UUI, SUI and MUI. Overweight and obesity was significantly associated with poor QoL in women with UI (p<0.0001). Among 36.1% of all patients with poor QoL, 79.9% were overweight and obese. **Conclusion:** Overweight and obesity are important risk factor of UI affecting daily activity and QOL considerably. Since more people suffer from obesity, the prevalence of UI with increased severity is likely to increase in young to mid-aged women. Weight loss should be considered as first line treatment for this patient population.

## Introduction

Urinary incontinence (UI) is a highly prevalent condition which is considerably higher in Kuwait as compared to other parts of the world [1, 2]. The prevalence of UI ranges from 5% to 70% worldwide. In the Middle East, the overall prevalence of urinary incontinence was between 20.3% and 54.8% [3]. UI is considered as a health priority by World Health Organization (WHO) [4]. It is not a life-threatening disease; however, it has a negative impact on the quality of life and women do not always seek medical help or advice [5].

Several population-based studies reported higher UI in females than males. Its predisposing factors are age, body mass index (BMI) and parity [6]. It was previously thought that older age and parity played important roles in the occurrence of UI [7, 8]. Yet, in a systematic review, the authors reported an increasing prevalence in both younger women and nulliparous women [9]. Many observational studies have shown that obesity and overweight is directly associated with urinary incontinence [10, 11]. Each 5-unit increase in BMI is associated with a 30–60% increased risk of daily urinary incontinence. When followed up for 5 to 10 years, the odd of urinary incontinence increased by 7% to 12% for each 1 kg/m<sup>2</sup> unit increase in BMI [10].

Obesity is a complex chronic disease which impairs health, increases the risk of long-term medical complications, and reduces lifespan [12, 13]. Since 1980, the prevalence of obesity and overweight has doubled globally, and nearly one-third of world's population is now classified as overweight or obese [14]. In Kuwait, obesity prevalence in women is high (over 50%) (Global, regional, and national prevalence of overweight and obesity in children and adults 1980-2013: A systematic analysis) [15] and it is listed by the WHO as global epicenters for obesity [15, 16]. The high prevalence of obesity has been attributed to various factors including demographic, lifestyle, economic and psychosocial [17].

Previous studies have focused mainly on parity and aging as the predisposing factors of UI. Other risk factors for UI, the severity of UI and quality of life of these women have not been thoroughly evaluated. The purpose of our study was to examine the prevalence, quality of life (QoL), severity and different types of urinary incontinence in overweight and obese women using an internationally validated questionnaire form.

## Methods and Materials

This cross-sectional study included all women aged ≥19 years who visited six primary care centers in Kuwait between June 2021 and May 2022. A total of 2000 women were contacted by phone. Of 1755 women who agreed to participate in the study, 1351 completed the online ICIQ-UI-SF questionnaire (Table.1) The study was conducted in accordance with the principles of the Declaration of Helsinki and approved by the ethical committee for coordination of health and medical research of the Kuwait Ministry of Health (study number 1302). All participants signed a written informed consent.

We used the International Consultation on Incontinence Questionnaire-Urinary Incontinence-Short Form (ICIQ-UI-SF). It is a validated and brief questionnaire made up of four sections:

## Conclusions

Obesity is strongly associated with an increased prevalence of UI. Given the high prevalence of obesity in our region, weight reduction should be advocated in the management and improvement of incontinence symptoms. Health policy makers must consider raising awareness of urinary incontinence.

Overweight and obesity are important risk factor of UI affecting daily activity and QOL. Weight loss should consider as first line treatment for this patients' population.

## Results

**Table 1.** Demographics of 1351 patients with or without urinary incontinence (UI).

Characteristics	No UI (n=524, 38.8%)	UI (n=827, 61.2%)	P value (95% CI)
Age (years)	33.7±12.1	43.4±14.1	<0.0001 (8.3 -11.1)
19-35 years	350 (66.8%)	283 (34.2%)	
36-45 years	84 (16%)	142 (17.1%)	
45-60 years	59 (11.3%)	299 (36.2%)	
>60 years	31 (5.9%)	103 (12.5%)	
Weight (kg)	64.41±12.2	73.7±15.3	<0.0001 (11.9- 14.8)
BMI (kg/m <sup>2</sup> )	25.2±4.4	28.9±5.8	<0.0001 (3.2 - 4.3)
<19 kg/m <sup>2</sup>	24 (4.6%)	17 (2.1%)	
19-24.9 kg/m <sup>2</sup>	238 (45.4%)	194 (23.5%)	
25-29.9 kg/m <sup>2</sup>	185 (35.3%)	278 (33.6%)	
≥30 kg/m <sup>2</sup>	77 (14.7%)	338 (40.9%)	
Parity	1.3±1.9	2.9±2.5	<0.0001 (1.3- 1.8)
0	314 (59.9%)	244 (29.5%)	<0.0001 (0.22-0.35)
1-2	80 (15.3%)	150 (18.1%)	0.08 (0.91- 1.65)
≥3	130 (24.8%)	433 (52.4%)	<0.0001 (2.07-3.38)
Number of vaginal deliveries	1.0±1.8	2.4±2.4	<0.0001 (1.2 - 1.6)
Number of cesarean deliveries	0.3± 0.7	0.5±1.1	0.001 (0.1 – 0.3)
Menopausal status			
• Pre-menopausal	458 (87.4%)	539 (65.2%)	<0.0001 (0.20- 0.36)
• Post-Menopausal	66 (12.6%)	288 (34.8%)	<0.0001 (2.76 -4.98)

**Table 2.** BMI versus Severity of UI based on ICIQ-Score

Categories	BMI						
	<25 (n=473)	25-29.9 (n=463)	OR	P-value (95% CI)	≥30 (n=415)	OR	P-value (95% CI)
UI (ICIQ≥1)	211 (44.6%)	278 (60.1%)	1.86	<0.0001 (1.4- 2.4)	338 (81.4%)	5.45	<0.0001(4.0-7.4)
• Mild UI (ICIQ=1-5)	86 (18.2%)	88 (19%)	1.47	0.05 (1.02- 2.11)	95 (22.9%)	3.81	<0.0001(2.57-5.66)
• Moderate (ICIQ=5-12)	91 (19.2%)	132 (28.5%)	1.99	<0.0001 (1.43-2.79)	136 (32.8%)	4.95	<0.0001 (3.40-7.19)
• Severe+V.severe (ICIQ≥13)	34 (7.2%)	58 (12.5%)	2.33	0.001(1.45- 3.74)	107 (25.8%)	10.34	<0.0001 (6.45-16.56)

**Table 3.** BMI and different urinary incontinence (UUI, SUI, MUI).

Categories	BMI						
	<25 (n=473)	25-29.9 (n=463)	OR	P-value (95% CI)	≥30 (n=415)	OR	P-value (95% CI)
UUI	74 (15.6%)	113 (24.4%)	2.20	<0.0001 (1.55-3.12)	123 (29.6%)	5.73	<0.0001(3.91-8.42)
SUI	55 (11.6%)	79 (17.1%)	1.71	<0.01 (1.17-2.5)	95 (22.9%)	5.88	<0.0001(3.87-7.89)
MUI	49 (10.4%)	72 (15.6%)	2.20	<0.001 (1.47-3.33)	114 (27.5%)	8.34	<0.0001 (5.44-12.77)

**Table 4.** BMI and urinary incontinence that interfered with daily activity

Categories	BMI						
	<25 (n=473)	25-29.9 (n=463)	OR	P-value (95% CI)	≥30 (n=415)	OR	P-value (95% CI)
QoL (scale 0-10)							
Mild bothersome (1-3)	88 (18.6%)	86 (18.6%)	1.34	0.13 (0.94-1.91)	86 (20.7%)	2.62	<0.0001(1.81-3.87)
Moderate bothersome (4-7)	52 (11%)	101 (21.8%)	2.62	<0.0001 (1.77- 3.86)	102 (24.6%)	5.23	<0.0001(3.47-7.89)
Great deal (8-10)	46 (9.7%)	66 (14.3%)	1.91	0.004 (1.25- 2.92)	121 (29.2%)	6.93	<0.0001 (5.48-10.49)

**Table 5.** Quality of life among UI women and BMI

Categories	BMI						
	<25 (n=473)	25-29.9 (n=463)	OR	P-value (95% CI)	≥30 (n=415)	OR	P-value (95% CI)
QoL (score)							
Good QoL (1-3)	375 (79.2%)	296 (63.9%)	0.46	<0.0001 (0.35-0.62)	192 (46.3%)	0.22	<0.0001 (0.17-0.3)
Poor QoL (4-7)	98 (20.7%)	167 (36.1%)	2.11	<0.0001 (1.57-2.85)	223 (53.7%)	4.35	<0.0001 (3.2-5.9)

Fig1:Severity of urinary incontinence with overweight and obese

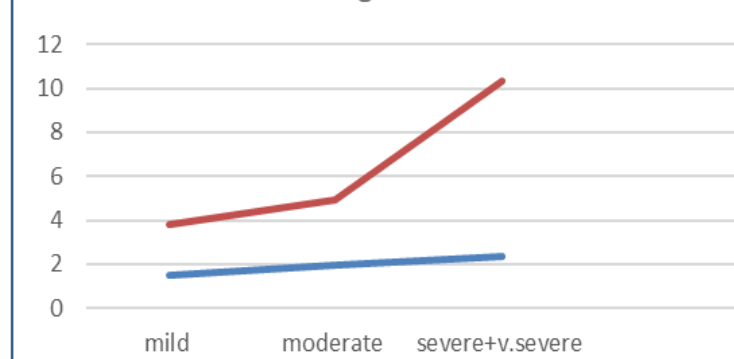


Fig2: subtypes of UI with correlation to BMI

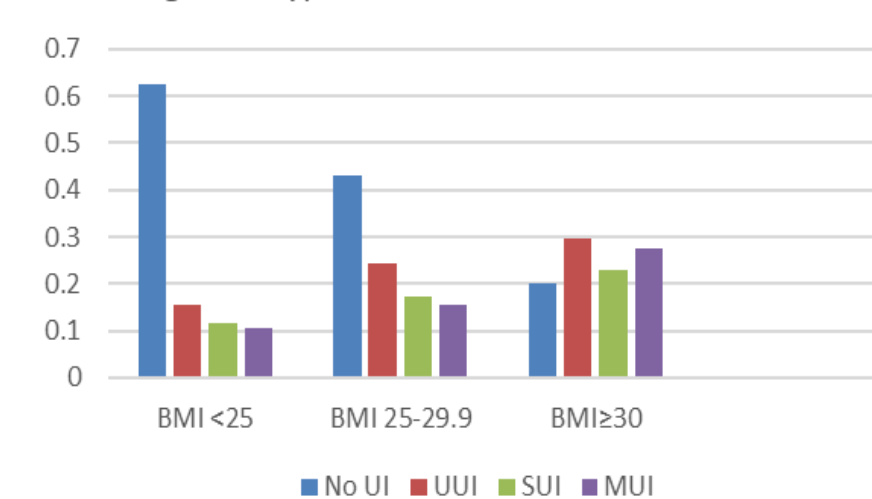
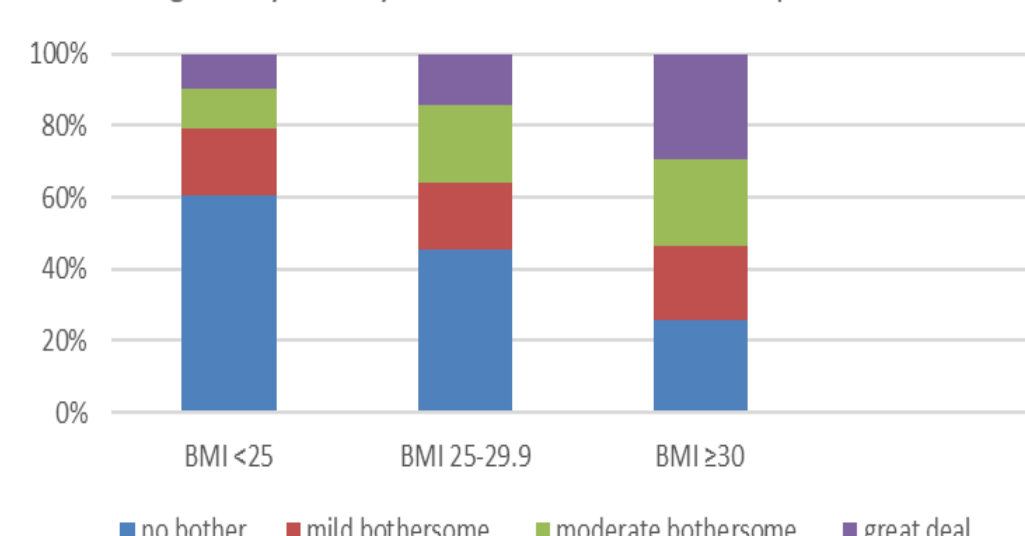


Fig3:Daily activity in women with UI with respect to BMI



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