

Evaluation of urinary incontinence and quality of life in married women aged between 20 and 49 years (Sakarya, Turkey)

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Background/aim: This study aimed to determine the prevalence of urinary incontinence and to evaluate the relationship between urinary incontinence and quality of life in married women.

Materials and methods: This is a cross-sectional study conducted among married women aged 20–49 years living in the vicinity of the Çökekler Community Clinic (Family Health Center) in Sakarya, Turkey, from 1 November 2011 to 15 April 2012. The study group consisted of 1161 women.

Results: The frequency of urinary incontinence was 71.5% (n = 830). Out of a total of 830 patients with symptoms of urinary incontinence, mixed was the most frequently determined type (60.4%), followed by urge (33.9%) and then stress urinary incontinence (5.8%). The mean scores obtained by women with urinary incontinence from the general health perceptions and social functioning domains of the SF-36 survey were lower (P < 0.05 for each domain).

Conclusion: Urinary incontinence was found to be a common problem among women, and it affects quality of life adversely. Recurrent urinary tract infection and advancing age were the key risk factors in the development of urinary incontinence.

Key words: Women, urinary incontinence, quality of life

1. Introduction

Urinary incontinence (UI) was defined by the International Continence Society as involuntary loss of urine, which is a social and hygienic problem and can be demonstrated objectively (1). The symptoms of UI are a major health issue, frequently occurring not only in developing countries but also in developed ones. The risk factors for UI in women include advancing age; conditions associated with high intraabdominal pressure such as chronic constipation and obesity; a large number of births; obstetric factors such as difficult delivery and birth trauma; systemic diseases such as chronic obstructive pulmonary disease, diabetes mellitus, cerebrovascular disease, and congestive heart failure; menopause, due to decreased estrogen levels; chain-smoking, as it may cause an antiestrogenic effect and decreased collagen synthesis; infectious diseases such as recurrent cystitis, cervicitis, and vaginitis; prior obstetric and gynecological surgical procedures; and a sedentary lifestyle (2–6).

It is not easy to determine the frequency of urinary incontinence accurately as the populations and methodological methods used differ from each other in studies conducted worldwide, and because of the fact that women refrain from talking about their complaints due to privacy reasons or consider their condition normal and do not present to a healthcare institution in the studies conducted in Turkey (2,7). The World Health Organization reported that over 200 million people have bladder control problems, and it is a major public health issue (8). The prevalence of UI was reported as 9.4%–54.8% around the world and as 16.4%–49.5% in Turkey (2,9–12).

Although UI is not a life-threatening problem, it is a health issue that adversely affects the quality of life and has social aspects because of its effects on daily life (13). UI may cause emotional problems associated with a feeling of inadequacy in women, due to continuous wetness, irritation, and odor. Women may feel at fault and inadequate as they cannot control their urinary function

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because of UI. They may deliberately isolate themselves from social life or reduce their daily intake of liquids, resulting in disruption of their quality of life (14–16).

This study was conducted to determine the prevalence of UI, to review certain factors believed to be associated with UI, and to assess the quality of life in married women aged 20–49 years in the vicinity of Çökekler Community Clinic (Family Health Center) in Sakarya, Turkey.

2. Materials and methods

This is a cross-sectional study conducted among married women aged 20–49 years living in the vicinity of Çökekler Community Clinic (Family Health Center) in Sakarya from 1 November 2011 to 15 April 2012.

As our study was conducted during the transition to the family practice model in Turkey, community clinics where primary care services are provided have started to serve as family health centers in their districts. The study site originally projected as a community clinic at the beginning of the study was therefore amended to a family health center. The Çökekler Community Clinic (Family Health Center) is one of 16 community clinics providing services in the center of Sakarya. The population of the community clinic's district was 10,953 in total, composed of 5630 men (51.4%) and 5323 women (48.6%). Of this female population, 44.5% ($n = 2366$) were in the age group of 20–49 years and 1856 of them (78.5%) were married.

Approval was obtained from the Ethics Committee of the Eskişehir Osmangazi University Faculty of Medicine, with decision number 2010/141, as well as the necessary permission from the Sakarya Provincial Health Directorate, before collecting data for the study.

The questionnaire was prepared in line with the study's objectives (1,3–6,17) and it included questions about certain sociodemographic characteristics of the women; their medical and obstetrical characteristics; the presence, type, and severity of urinary incontinence; and results of the SF-36 quality of life survey.

The study group consisted of 1161 married women (72%) who were found at home by visiting all the houses in the district of the Çökekler Community Clinic and who agreed to take part in the study. Women who were unavailable, those who did not agree to take part in the study, those who could not be contacted, and pregnant women were not included in the study. The women were informed about the subject and objective of the study and their verbal consent was obtained. Previously prepared questionnaire forms were completed by the women under supervision. This procedure lasted approximately 20–25 min.

Among the women who constituted the study group, those who had any kind of urinary leakage symptoms within the last 4 weeks were deemed to have urinary incontinence. Women with a complaint of leaking of urine

during exercise, lifting, or physical activities were deemed to have stress urinary incontinence (SUI). Those with a complaint of leaking of urine with a sudden need to urinate without any warning were deemed to have urge urinary incontinence (UUI), and those experiencing leaking of urine in both cases were deemed to have mixed urinary incontinence (MUI) (17). The number of urinary leakage cases was taken as a basis while assessing the severity of urinary incontinence. Complaints of urinary leakage were defined as mild for a few incidents in a week, as moderate for 1 or 2 incidents in a day, and as severe for 3 or more incidents in a day (1).

In our study, the SF-36 Health-Related Quality of Life Survey was used to assess quality of life. The SF-36 survey was developed by Ware and Sherbourne in 1992 and the reliability and validity study in Turkey was conducted by Koçyiğit et al. (18,19). This survey consists of 36 items and assesses quality of life in 8 domains (physical functioning, role-physical, social functioning, role-emotional, mental health, vitality, bodily pain, and general health perceptions). The questionnaire's domain scores range between 0 and 100, higher scores denoting a better health-related quality of life.

Women actively engaged in a revenue-generating business were defined as employed in this study. Family income was assessed by the women as low, average, or high based on their own perceptions. Women who smoked at least 1 cigarette a day regularly were defined as smokers (20), and those who consumed at least 30 g of ethyl alcohol in a week were regarded as alcohol consumers (21). Those with a history of physician-diagnosed chronic disease (diabetes mellitus, hypertension, cerebrovascular event, etc.) were deemed to have chronic disease. Women who had 3 or more physician-diagnosed urinary tract infections, characterized by symptomatic attacks in the last 1 year, were considered to have recurrent urinary tract infections (22). Chronic constipation was defined as straining, hard stools, prolonged time to stool, incomplete evacuation, and a sense of difficulty passing stool, with these complaints lasting longer than 3 months (23). Women who had experienced spontaneous cessation of menstruation within the last 1 year were regarded as menopausal women (24). After the questionnaires were completed, the women's heights were measured with a tape measure body weights were measured with a bathroom scale. Those whose body mass index was above 30 kg/m² were considered obese.

The data obtained were evaluated with IBM SPSS 20.0 (IBM Corp., Armonk, NY, USA). The chi-square test, logistic regression analysis (backward: Wald), Mann-Whitney U test, and Kruskal-Wallis test were used for statistical analyses. Statistical significance was accepted as $P < 0.05$.

3. Results

The ages of the women in the study group ranged from 20 to 49, with a mean age of 36.38 ± 7.39 years. The frequency of urinary incontinence was determined to be 71.5% (n = 830) in this study. The distribution of women with or

without urinary incontinence by certain sociodemographic characteristics is given in Table 1.

The distribution of women with or without urinary incontinence by certain medical and obstetric characteristics is given in Table 2.

Table 1. Sociodemographic characteristics of the women with and without urinary incontinence in the study group.

Sociodemographic variables	Urinary incontinence			Statistical test value: χ^2 ; P
	No n (%)*	Yes n (%)*	Total n (%)**	
Age group (years)				
20-29	90 (38.6)	143 (61.4)	233 (20.1)	52.018; 0.000
30-34	89 (33.8)	174 (66.2)	263 (22.7)	
35-39	82 (34.2)	158 (65.8)	240 (20.7)	
40-44	43 (20.0)	172 (80.0)	215 (18.5)	
45-49	27 (12.9)	183 (87.1)	210 (18.1)	
Educational level				
Illiterate	17 (22.7)	58 (77.3)	75 (6.5)	1.358; 0.507
Primary or secondary school	159 (28.8)	394 (71.2)	553 (47.6)	
High school and over	155 (29.1)	378 (70.9)	533 (45.9)	
Employment status				
Unemployed	269 (33.4)	536 (66.6)	805 (69.3)	31.005; 0.000
Employed	62 (17.4)	294 (82.6)	356 (30.7)	
Working conditions^a				
Generally sitting	14 (15.1)	79 (84.9)	93 (26.1)	0.291; 0.589
Generally standing	48 (18.3)	215 (81.7)	263 (73.9)	
Family income status				
Low	159 (24.8)	483 (75.2)	642 (55.3)	10.349; 0.006
Moderate	149 (33.7)	293 (66.3)	442 (38.1)	
High	23 (29.9)	54 (70.1)	77 (6.6)	
Family type				
Nuclear	273 (30.5)	622 (69.5)	895 (77.1)	7.612; 0.006
Large	58 (21.8)	208 (78.2)	266 (22.9)	
Smoking				
No	192 (23.1)	640 (76.9)	832 (71.7)	42.520; 0.000
Yes	139 (42.2)	190 (57.8)	329 (28.3)	
Alcohol consumption				
No	309 (27.8)	804 (72.2)	1113 (95.9)	6.512; 0.011
Yes	22 (45.8)	26 (54.2)	48 (4.1)	
Obesity				
No	286 (30.9)	640 (69.1)	926 (79.8)	12.667; 0.000
Yes	45 (19.1)	190 (80.9)	235 (20.2)	
Total	331 (28.5)	830 (71.5)	1161 (100.0)	

Percentages were calculated *based on the line total and **based on the column total.

^a: Working conditions were assessed based on 356 working women.

Table 2. Medical and obstetric characteristics of women with and without urinary incontinence in the study group.

Medical and obstetric characteristics	Urinary incontinence			Statistical analysis: χ^2 ; P
	No n (%)*	Yes n (%)*	Total n (%)**	
Physician-diagnosed chronic disease				
No	279 (32.1)	589 (67.9)	868 (74.8)	22.272; 0.000
Yes	52 (17.7)	241 (82.3)	293 (25.2)	
Recurrent urinary tract infections				
No	293 (43.1)	387 (56.9)	680 (58.6)	171.147; 0.000
Yes	38 (7.9)	443 (92.1)	481 (41.4)	
Chronic constipation				
No	274 (31.5)	596 (68.5)	870 (74.9)	15.168; 0.000
Yes	57 (19.6)	234 (80.4)	291 (25.1)	
History of pelvic surgery				
No	312 (28.3)	790 (71.7)	1102 (94.9)	0.247; 0.619
Yes	19 (32.2)	40 (67.8)	59 (5.1)	
History of gynecological surgery				
No	331 (29.1)	808 (70.9)	1139 (98.1)	7.574; 0.006
Yes	0 (0.0)	22 (100.0)	22 (1.9)	
Number of pregnancies				
0	29 (39.2)	45 (60.8)	74 (6.4)	4.553; 0.103
1–2	126 (28.4)	318 (71.6)	444 (38.2)	
3 and above	176 (27.4)	467 (72.6)	643 (55.4)	
Menopause				
No	313 (30.8)	703 (69.2)	1016 (87.5)	21.062; 0.000
Yes	18 (12.4)	127 (87.6)	145 (12.5)	
Total	331 (28.5)	830 (71.5)	1161 (100.0)	

Percentages were calculated *based on the line total and **based on the column total.

The results of the logistic regression analysis created with the variables determined to be associated with urinary incontinence (e.g., age, working status, family income level, family type, smoking, alcohol consumption, obesity, history of physician-diagnosed chronic disease, recurrent urinary tract infections, chronic constipation, and menopause) are presented in Table 3.

Median scores in all domains of the SF-36 survey, except for the role-physical domain ($P > 0.05$), were determined to be significantly lower in women with a history of urinary incontinence compared to those without a history of UI ($P < 0.05$ for each domain). Median scores obtained from the domains of the SF-36 survey by women with and without a history of urinary incontinence in the study group are given in Table 4.

Of the urinary incontinence cases in the study, 600 (72.3%) were mild, 215 (25.9%) were moderate, and 15

(1.8%) were severe. The median scores obtained from the domains of the SF-36 survey by women with a history of urinary incontinence in the study group are given in Table 5 by the severity of UI.

In this study, 48 cases (5.8%) were SUI, 281 (33.8%) were UUI, and 501 (60.4%) were MUI. The median scores obtained from the domains of the SF-36 survey by women with a history of urinary incontinence in the study group, by the type of UI, are given in Table 6.

4. Discussion

The frequency of UI was determined to be 71.5% in this study. Several studies reported that the frequency of UI ranged from 9.4% to 67.9% in women (2,10,11,25–28). The reasons for the different results reported may be explained by the use of different methods for diagnosing UI and the conducting of studies on populations with different characteristics.

Table 3. Significant independent variables for urinary incontinence according to logistic regression analysis (final step).

Variables	β	SE ^a	P	OR ^b	95% CI ^c
Constant	2.032	0.270	0.000		
Age group (reference: 20–29)					
30–34	0.465	0.227	0.041	1.591	1.019–2.484
35–39	0.099	0.251	0.694	1.104	0.675–1.805
40–44	0.636	0.269	0.018	1.889	1.115–3.200
45–49	1.581	0.298	0.000	4.860	2.710–8.716
Employment status (reference: unemployed)					
Employed	1.167	0.188	0.000	3.212	2.223–4.640
Family income status (reference: moderate)					
High	0.514	0.170	0.002	1.673	1.199–2.333
Low	1.107	0.302	0.000	3.024	1.674–5.465
Family type (reference: nucleus)					
Large	0.800	0.202	0.000	2.226	1.499–3.306
Smoking (reference: yes)					
No	1.027	0.170	0.000	2.794	2.004–3.895
Obesity (reference: no)					
Yes	0.730	0.229	0.001	2.074	1.325–3.246
History of recurrent urinary tract infections (reference: no)					
Yes	2.378	0.209	0.000	10.785	7.159–16.247
History of chronic constipation (reference: no)					
Yes	0.484	0.197	0.014	1.622	1.103–2.388

^a: SE: Standard error, ^b: OR: odds ratio, ^c: CI: confidence interval.

Table 4. Median scores obtained from the domains of the SF-36 survey by women with and without a history of urinary incontinence in the study group.

Domains	SF-36 score		Statistical analyses: z; P-value
	Urinary incontinence		
	No (n = 331), median (min–max)	Yes (n = 830), median (min–max)	
Physical functioning	90.0 (0–100)	85.0 (0–100)	6.331; 0.000
Role-physical	100.0 (0–100)	100.0 (0–100)	1.825; 0.068
Bodily pain	70.5 (11.4–100)	56.8 (0–100)	4.874; 0.000
General health perception	57.8 (0–96.7)	55.6 (5.6–100)	5.219; 0.000
Vitality	58.3 (0–100)	50.0 (0–100)	7.653; 0.000
Social functioning	71.4 (0–100)	57.1 (0–100)	6.861; 0.000
Role-emotional	100.0 (0–100)	100.0 (0–100)	4.017; 0.000
Mental health	56.3 (6.3–87.5)	50.0 (0–93.8)	2.151; 0.000

Table 5. The median scores obtained from the domains of the SF-36 survey by the severity of urinary incontinence.

Domains	SF-36 score			Statistical analyses: KW; P-value
	Severity of urinary incontinence			
	Mild (n = 600), median (min-max)	Moderate (n = 215), median (min-max)	Severe (n = 15), median (min-max)	
Physical functioning	90.0 (0-100)	85.0 (25-100)	80.0 (25-100)	31.187; 0.000
Role-physical	100.0 (0-100)	100.0 (0-100)	100.0 (0-100)	0.611; 0.737
Bodily pain	68.2 (0-100)	68.2 (44.3-100)	47.7 (11.4-100)	30.973; 0.000
General health perception	57.8 (5.6-100)	46.7 (16.7-100)	38.9 (27.8-57.8)	32.083; 0.000
Vitality	50.0 (0-100)	50.0 (8.3-100)	50.0 (0-58.3)	0.335; 0.846
Social functioning	57.1 (0-100)	57.1 (14.3-100)	57.1 (0-100)	12.794; 0.002
Role-emotional	100.0 (0-100)	100.0 (0-100)	66.7 (0-100)	7.548; 0.023
Mental health	50.0 (6.3-93.8)	56.3 (0-87.5)	56.3 (37.5-75)	1.577; 0.455

Results of the multiple comparison:

- Physical functioning: Moderate-Severe, P = 0.000.
- Bodily pain: Mild-Moderate, P = 0.000; Moderate-Severe, P = 0.002.
- General health perception: Mild-Moderate, P = 0.023; Mild-Severe, P = 0.000.
- Social functioning: Mild-Severe, P = 0.002.
- Role-emotional: Moderate-Severe, P = 0.042.

Table 6. The median scores obtained from the domains of the SF-36 survey by women with a history of urinary incontinence in the study group by the type of UI.

Domains	SF-36 score			Statistical analyses: KW; P-value
	Type of urinary incontinence			
	Stress (n = 48), median (min-max)	Urge (n = 281), median (min-max)	Mixed (n = 501), median (min-max)	
Physical functioning	85.0 (20-100)	90.0 (20-100)	65.0 (0-100)	62.213; 0.000
Role-physical	100.0 (0-100)	100.0 (0-100)	75.0 (0-100)	16.383; 0.000
Bodily pain	56.8 (11.4-100)	56.8 (21.6-100)	58.8 (0-100)	2.239; 0.326
General health perception	66.7 (16.7-96.7)	50 (16.7-100)	46.7 (5.6-100)	71.926; 0.000
Vitality	58.3 (16.7-83.3)	50.0 (0-100)	50.0 (8.3-91.7)	10.555; 0.005
Social functioning	71.4 (14.3-100)	57.1 (0-100)	57.1 (0-100)	67.838; 0.000
Role-emotional	100.0 (0-100)	100.0 (0-100)	66.7 (0-100)	15.112; 0.001
Mental health	59.4 (25-75)	56.3 (12.5-93.8)	50.0 (0-87.5)	13.107; 0.001

Results of the multiple comparison:+

- Physical functioning: Stress-Mixed, P = 0.000; Stress-Urge, P = 0.000; Urge-Mixed, P = 0.000.
- Role-physical: Urge-Mixed, P = 0.000.
- General health perception: Stress-Urge, P = 0.000; Stress-Mixed, P = 0.010.
- Vitality: Urge-Mixed, P = 0.000.
- Social functioning: Stress-Mixed, P = 0.000; Stress-Urge, P = 0.001.
- Role-emotional: Stress-Mixed, P = 0.000; Urge-Mixed, P = 0.00.
- Mental health: Urge-Mixed, P = 0.035; Stress-Mixed, P = 0.008.

While bladder capacity, ability to postpone voiding, maximum urethral closure pressure, and functional urethral length decline, uninhibited bladder contractions increase with advancing age. These conditions developing with advancing age are known to raise the frequency of UI (29). Being in the age group of 45–49 years was a key risk factor for UI in this study (OR: 4.860; $P = 0.000$). There are other studies reporting similar results (2,30).

Active engagement with a revenue-generating business was found to increase the frequency of UI by 3.212 times in our study ($P = 0.000$). No difference was found between the women's working conditions and the frequency of UI ($P = 0.589$). Working life extends daily activities and makes lifestyles different. The sedentary lifestyle of unemployed women was reported to constitute a risk factor for UI in the literature. However, the results of our study were not consistent with the literature. Since the working conditions of working women were not defined, their physical activities are not known. It is thought that this is the reason for these inconsistent results.

Since poor socioeconomic conditions may cause difficult and harsh working conditions, it could be a factor for high frequency of UI. Low family income level was one of the risk factors for UI in our study (OR: 3.024; $P = 0.000$). Some other studies reported no relationship between the frequency of UI and family income level (28,30,31).

In this study, the frequency of UI was found to be higher by 2.7945 times in nonsmokers compared to smokers ($P = 0.000$). Contrary to the results of our study, heavy smoking was reported as a risk factor for UI, as it causes an antiestrogenic effect and reduction in collagen synthesis (3). This result of our study may be associated with more frequent urinary incontinence in advanced age groups and higher levels of smoking in the younger age group with lower UI. Furthermore, time and dose relations in smoking, which are effective in the development of UI, were not considered in our study.

Increased body weight was believed to be one of the risk factors for UI as it causes increased abdominal and intravesical pressure (32–34). In our study, obesity was found to be a risk factor for UI (OR: 2.074; $P = 0.001$). There are some other studies reporting similar results (35–37), whereas some studies found no correlation between obesity and urinary incontinence (38,39).

Several studies found that certain chronic diseases (e.g., diabetes, hypertension) are a risk factor for UI (2,12,28,40,41). In this study, the frequency of UI was higher in women with a history of physician-diagnosed chronic disease ($P = 0.000$). This may be associated with neurological conditions caused by chronic diseases and with the medications used for such diseases (16).

In this study, the most prominent risk factor for UI was the history of recurrent urinary tract infection (OR: 10.785;

$P = 0.000$). As urinary tract infections cause stimulation of involuntary detrusor contractions, they were regarded as a risk factor for urinary incontinence (2,42). Other studies reported similar results (2,12,41).

Chronic constipation may cause weakened pelvic floor muscles and increased intraabdominal pressure resulting from damage in pelvic floor tissue and weakening of ligaments because of constant straining. Constipation may also increase the frequency of urinary incontinence by causing pressure on the bladder (43). In our study, chronic constipation was determined to be a risk factor for urinary incontinence (OR: 1.622; $P = 0.014$). The results of other studies support these findings (2,41).

Gynecological and pelvic surgeries are known to increase the frequency of UI by causing damage to the pelvic floor muscles, scars, and nerve damage (44). In women with a history of gynecological surgery in our study, the frequency of UI was significantly higher ($P = 0.006$). Our results are in parallel with the literature (2,45).

The frequency of UI was higher in menopausal women in the study group ($P = 0.000$). Reduction in circulating estrogen after menopause, physiological changes in the lower urinary tract, advancing age, and an inadequate number of estrogen receptors are all associated with the higher frequency of UI (46). Similar results have been reported in other studies (2,16,30,31).

Quality of life in all domains of the SF-36 survey, except for the role-physical domain ($P = 0.068$), was determined to be poorer in women with a history of UI compared to those without a history of UI ($P = 0.000$ for each domain). UI is revealed as a key health issue, which affects quality of life adversely; limits daily life activities for reasons such as leaking of urine noticed by others, odor of urine, and constantly feeling wet; and causes social isolation and disrupts emotional and psychological well-being (30,47). The study by Özdemir et al. suggested that the scores obtained from the SF-36 quality of life survey by those with UI were significantly lower than those without UI (16). Oh et al. reported that the scores obtained from the SF-36 survey were lower in the domains of role-physical, vitality, mental health, and bodily pain (31). Van Brummen et al. suggested that women with UI are adversely affected physically, socially, and emotionally and suffer from limitations to their lifestyle (48).

Our study revealed that the quality of life of women with severe UI was poorer in the domains of the SF-36 survey ($P < 0.05$ for each domain), except for role-physical, vitality, and mental health ($P > 0.05$ for each domain). Özdemir et al. and Özerdoğan et al. reported consistent results (16,30). Velazquez et al. found that the lowest scores were obtained from social isolation (36). Papanicolaou et al. reported that physical and social activities of women with UI were affected adversely and that these parameters

increased with the severity of UI at a statistically significant level (49).

When quality of life was assessed in women with a history of UI by type of UI, the quality of life was determined to be poorer in women with mixed UI in the domains of the SF-36 survey ($P < 0.05$ for each domain), except for bodily pain ($P > 0.05$). Some studies suggested a poorer quality of life in women with mixed UI (2,16,28,30,50).

The limitations of this study may include the fact that it is a cross-sectional study and that it was conducted only among women at a single location. The facts that urodynamic studies, clinical examination, and other tests were not used to classify the presence and types of urinary incontinence, and that leakage amount was taken into account instead of the severity index based on frequency and amount of urinary leakage to evaluate the severity of UI, were other pertinent limitations.

In conclusion, urinary incontinence was a common issue among women living in the region where this study

was conducted. In our study, being in the age group of 45–49 years, engaging actively in any revenue-generating business, low family income, having a large family, obesity, history of recurrent urinary tract infections, and chronic constipation were determined to be risk factors for urinary incontinence. Of the women with UI, quality of life was poorer in severe cases and among those with mixed UI. It would be advantageous to organize health trainings in order to raise awareness among women about UI and for them to receive professional help regarding the risk factors. More extensive studies are required to demonstrate the relationship between UI and quality of life.

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