NORTHWESTERN MEDICAL JOURNAL

Northwestern Med J. 2024;4(2):70-80
DOI: 10.54307/NWMJ.2024.109

RESEARCH ARTICLE

Investigation of pelvic floor knowledge, awareness and healthcare seeking in women with urinary incontinence: A cross-sectional study

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Cite as: Yakıt Yeşilyurt S, Yıldız ED, İnal B, et al. Investigation of pelvic floor knowledge, awareness and healthcare seeking in women with urinary incontinence: A cross-sectional study. Northwestern Med J. 2024;4(2):70-80.

ABSTRACT

Aim: Healthcare seeking by women with urinary incontinence is affected by many factors. However, the effect of pelvic floor awareness and knowledge on seeking health care is not clear. We aimed to investigate the relationship between pelvic floor awareness, urinary incontinence (UI) and pelvic floor knowledge levels and healthcare seeking in women with incontinence.

Methods: A total of 178 women, 96 incontinent and 82 continent, were included in the study. The presence of UI was evaluated with Incontinence Questionnaires (3IQ), incontinence knowledge level with the Prolapse and Incontinence Knowledge Questionnaire (PIKQ-UI), and pelvic floor knowledge with the Pelvic Floor Health Knowledge Quiz (PFHKQ). Pelvic floor awareness and treatment seeking were measured with open-ended questions compiled from the literature. The Mann Whitney U, Chi-square and Kruskal Wallis tests were used. A value of $p<0.05$ was considered statistically significant.

Results: There were significant differences between the PIKQ-UI scores of incontinent women who answered yes or no to questions about pelvic floor awareness ($p<.05$) and seeking health care ($p=0.039$). The PIKQ-UI scores of incontinent women were higher than those of continent women ($p=0.033$). Incontinent and continent women had similar PFHKQ

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Received: 10.03.2023 **Accepted:** 04.07.2023 **Published:** 30.04.2024

scores (p>0.05). A difference was observed in the purpose of seeking information about the pelvic floor between women with and without incontinence (p=0.002).

Conclusions: The knowledge level of incontinent women with pelvic floor awareness and who seek health care was higher than that of incontinent women without pelvic floor awareness and who do not seek health care. Pelvic floor awareness in incontinent women may contribute to healthcare seeking and increase the level of knowledge about incontinence and pelvic floor.

Keywords: awareness, healthcare seeking, knowledge, urinary incontinence

INTRODUCTION

International organizations such as the International Urogynecological Association and the International Continence Society define the pelvic floor as the structures located within the bony pelvis, i.e., urogenital, and anorectal viscera, pelvic floor muscles and their connective tissues, nerves, and blood vessels. Pelvic floor dysfunction (PFD) is defined as a damage/injury to these structures (1). Urinary incontinence (UI) is one of the most common PFD (2).

UI is defined as the involuntary leakage of urine (1). UI, which is frequently seen in women, reduces the quality of life and has a negative psychosocial impact (3). Despite its high prevalence and being a treatable disease, many affected women do not seek treatment (4). Previous studies have reported that only between 22-50% of women with UI seek treatment (5,6). Lack of knowledge about the causes of UI, treatment options or what it entails, as well as the widespread myth that UI is simply a consequence of childbearing and ageing, all have a negative impact on treatment seeking. Regardless of the progress made in access to information in recent years, misconceptions about UI are still very common, and therefore, this condition should be the focus of health professionals. In addition, the lack of information about UI negatively affects the decision to seek health care (7).

Knowledge of UI and health care seeking are frequently assessed in the literature. However, fewer studies aim to assess women's knowledge and awareness of pelvic floor diseases (2,8). It has been reported that PFD is more common in women with poor pelvic floor awareness and knowledge, and therefore acquiring more knowledge of pelvic floor health might encourage women to seek healthcare (9,10). Previous studies have reported that factors such as severity of incontinence, ethnicity, age, and loss of ablution influence women with UI to seek healthcare (11-13). However, there is a lack of clarity about the effect of pelvic floor awareness and knowledge on health care seeking. Therefore, this study aimed to investigate the relationship between pelvic floor awareness, UI, pelvic floor knowledge levels, and healthcare seeking in women with incontinence.

MATERIALS AND METHODS

Study design and participants

This cross-sectional study was carried out as a web-based assessment using an online form (Google forms) due to the Covid-19 pandemic. A total of 178 women, 96 incontinent and 82 continent, were included in the study. These were women aged between 20 and 75 years, who were able to speak and read Turkish, and volunteered to participate in the study. Women who could not use smartphones and computers were excluded from the study. Informed consent was obtained from all individual participants.

This study was performed in line with the principles of the Declaration of Helsinki. The approval was granted by the Bolu Abant İzzet Baysal University Clinical Research Ethics Committee (Date: 13.04.2021/No: 2021/81).

Sample size

G-Power 3.0.10 program was used to calculate the sample size. Since no equivalent study in the literature with a hypothesis similar to the one in this study, a moderate (w=0.5) effect size would be significant when comparing the incontinent and the continent women. We planned to recruit a total of at least 128 women,

with a minimum of 64 in each group, giving a statistical power of 80% (α = 5%). The study was carried out as a web-based assessment. Due to the estimated dropout rate (the possibility of women misunderstanding the question, leaving it blank, or overlooking it) of 20%, we aimed to recruit at least 154 (77/77) women.

Data collection instruments

Women's socio-demographic and physical characteristics (age, weight, height, education, occupation, marital status, menstrual status, and obstetric history) were recorded. The presence of UI, incontinence and pelvic floor knowledge levels were assessed using an online form. The presence of UI, incontinence and pelvic floor knowledge levels were evaluated using the 3 Incontinence Questionnaires (3IQ), the Prolapse and Incontinence Knowledge Questionnaire (PIKQ), and the Pelvic Floor Health Knowledge Quiz (PFHKQ), respectively. Pelvic floor awareness and health care seeking were measured with open-ended questions compiled from the literature.

Presence of urinary incontinence

The presence of UI in women was assessed using the 3 Incontinence Questionnaires (3IQ). This questionnaire consists of three questions and takes approximately 30 seconds to complete (14).

Incontinence knowledge

Women's knowledge about incontinence was assessed using the Turkish version of the PIKQ. The questionnaire consists of two scales with 12 items. There is a UI scale to assess women's knowledge of UI and a POP scale to assess their knowledge of pelvic organ prolapse (POP). The Cronbach's alpha value was reported as 0.825 for the UI scale and 0.895 for the POP scale. The PIKQ evaluates women's knowledge about the epidemiology, pathogenesis, diagnosis, and treatment of UI and POP. The patients were asked to respond to each questionnaire item with "agree", "disagree", or "I Don't Know". Scoring was based on the percentage of questions answered correctly. Questions answered with "I Don't Know" considered incorrect (15). the UI subscale of the PIKQ (PIKQ-UI) was used in this study.

Pelvic floor awareness

Pelvic floor awareness was assessed by 4 questions compiled from the literature (16-18). These questions were "Have you ever heard the expression "pelvic floor muscles"? (PFA-1)", "Have you ever received any information about pelvic floor muscles? (PFA-2)", "If you have received information, what was it for (PFA-2a) and from whom did you receive it? (PFA-2b)", "Have you ever done any research on pelvic floor muscles? (PFA-3)", "What sources did you use in your research? (PFA-3a)" and "Have you ever heard of pelvic floor muscle exercise? (PFA-4)". The answers to the questions PFA-1, PFA-2, PFA-3 and PFA-4 were recorded as Yes/No. If the answer to the question PFA-2 was "Yes", women were asked to answer the PFA-2a and PFA-2b questions. The answers to question PFA-2a were "to obtain knowledge", "for educational purposes", "to seek health care for UI", "for pregnancy education". The answers to PFA-2b were recorded as "Physiotherapist", "Gynecology and Obstetrician", "Midwife/Nurse", "Friend/Family", "School", "General Practitioner", "Other", and "Multiple Sources". If the answers to the question PFA- 3 were "Yes", women were asked to answer the question PFA-3a and the answers were recorded as "Physiotherapist", "Books", "Internet" and "Multiple resources". Women were classified according to their answers to questions PFA-1, PFA-2, PFA-3, and PFA-4. The answer "Yes" to the questions about pelvic floor awareness was interpreted as "I am aware.", the answer "No" as "I am not aware.".

Pelvic floor knowledge

Pelvic floor knowledge was measured using the PFHKQ. The PFHKQ consists of 29 questions, with the available answers "Yes", "No" and "I Don't Know". In the test, there is a dichotomous scoring system. Correctly answered questions receive a score of "1", and incorrect answers and unanswered questions receive a score of "0". The PFHKQ was developed by Al-Deges et al. (19).

Healthcare seeking of incontinent women

The healthcare seeking behavior of incontinent women was surveyed as stated in the literature (13,20,21). The questions were "Have you ever been treated for

incontinence? (HCS-1)", "Which conditions related to your incontinence bothered you and led you to seek treatment? (HCS-2)", "Who referred you to seek treatment? (HCS-3)". The answers to the question HCS-1 were recorded as "Yes/No". The answers given to the HCS-2 question were grouped as "Wetness/ hygiene etc.", "My social/work/outdoor life was negatively affected", "I have symptoms" and "I did not seek treatment". Responses to HCS-3 were categorized as "Physiotherapist", "Doctor", "Family", "Friend" and "Myself", "I did not seek treatment".

Analysis of data

The data were analyzed using the Statistical Package for the Social Sciences (SPSS version 21.0) software. For descriptive statistics, numbers and percentages were given in categorical data, mean, standard deviation or median, and minimum-maximum values were given in numerical data. The Kolmogorov-Smirnov test and graphs (box-line graph, histogram, etc.) were used for the assumption of normality. For the comparison of the two group, t-test or Mann Whitney U test was used for independent groups, and one-way analysis of variance or Kruskal Wallis test was used to compare three or more groups. In case of differences, post-hoc tests were used. Relationship analysis of categorical variables was done with chi-square tests. The level of significance was set at $p<0.05$.

RESULTS

Physical and socio-demographic characteristics of incontinent and continent women are shown in Table 1. The analysis revealed a statistically significant difference between continent and incontinent women in terms of age, BMI, level of education, presence of chronic disease, menstrual status, number of pregnancies, and live births ($p<0.05$).

The answers to the questions PFA-1, PFA-2, PFA-3, and PFA-4 of the continent and incontinent women were similar (p=0.551, p=0.328, p=0.504, p=0.392, respectively) (Table 2). However, there were differences between the purpose of obtaining information about the pelvic floor muscles. It was determined that 40% of the incontinent women sought information for educational purposes, and 50% of them sought information to find a solution to their urinary incontinence problem (p=0.002) (Table 2). In addition, statistically significant differences were found in the PIKQ-UI scores of continent and incontinent women (p=0.033), with incontinent women having higher PIKQ-UI scores. The PIKQ subscales scores were calculated proportionally over 100 points. The PIKQ-UI score of incontinent women, 8 points, was 66.6%, the PIKQ-UI score of continent women, 7 points, was 58.3%. The PFHKQ scores of continent and incontinent women were similar (p=0.294) (Table 2).

A comparison was made between healthcare seeking incontinent women with and without pelvic floor awareness. 36 women with UI who had never heard of pelvic floor muscle did not seek treatment (p=0.002). 61 women with UI who did not seek information about pelvic floor muscles had never been treated before (p=0.035). 40 women with UI, who had not received information about pelvic floor muscles, had never sought treatment. 10 women with UI received information about pelvic floor from physiotherapists (p=0.002). 42 women with UI who had not previously sought information about pelvic floor muscles had never sought treatment before (p=0.042). 33 women with UI who had never heard the term 'pelvic floor exercise' had never sought treatment (p=0.004) (Table 3).

Incontinent women were classified according to their answers to the questions PFA-1, PFA-2, PFA-3, and PFA-4. The PIKQ-UI scores of women who answered 'Yes' to these questions were higher than those who answered 'No'. In addition, those who answered 'Yes' to the questions PFA-1, PFA-2 and PFA-4 had higher PFHKQ scores than those who answered 'No' (Table 4). For the PFA-3 question, similar PFHKQ scores were found for all, regardless of whether they answered 'Yes' or 'No' answers (p=0.123) (Table 4).

It was determined that there was a difference between the PIKQ-UI scores of women with UI who answered 'Yes' and 'No' to the HCS-1 question (p=0.039), however, their PFHKQ scores were similar (p=0.080) (Table 5).

Table 1. Comparison of physical and demographic characteristics by incontinence status

Characteristics		Incontinence Status		p
		Continent (n=82)	Incontinent (n=96)	
Age (y)		42.22 ± 10.89	48.75 ± 11.88	<0.001
BMI (kg/m²)		23.96 ± 4.33	28.29 ± 4.85	<0.001
Occupation	Housewife	32 (39.0)	52 (54.2)	0.130
	Officer	27 (32.9)	19 (19.8)	
	Private sector	16 (19.5)	15 (15.6)	
	Retired	7 (8.5)	10 (10.4)	
Education level	Primary school	11 (13.4)	34 (35.4)	0.002
	Middle School	8 (9.8)	8 (8.3)	
	High school	17 (20.7)	16 (16.7)	
	Licence	44 (58.7)	31 (32.3)	
	Graduate	2 (2.4)	7 (7.3)	
Chronic Disease	No	75 (91.5)	64 (66.7)	<0.001
	Yes	7 (8.5)	32 (33.3)	
	Hypertension	3 (42.9)	10 (31.3)	
	Heart disease	3 (42.9)	1 (3.1)	
	Diabetes	1 (14.2)	5 (15.6)	
	COPD/asthma	0 (0.0)	5 (15.6)	
	Multiple chronic disease	0 (0.0)	11 (34.4)	
Menstrual Status	Regular menstruation	56 (68.3)	43 (44.8)	0.003
	Irregular menstruation	8 (9.8)	9 (9.4)	
	Spontaneous menopause	17 (20.7)	34 (35.4)	
	Surgical menopause	1 (1.2)	10 (10.4)	
		n=66	n=87	
Gravida (n= 153)		2.0 [1.0– 8.0]	3.0 [1.0 – 11.0]	<0.001
		n=65	n=83	
Alive children (n= 148)		2.0 [1.0 – 10.0]	2.0 [1.0 – 8.0]	0.007

BMI: Body Mass Index

DISCUSSION AND CONCLUSION

Our study revealed some important findings about the relationship between UI and pelvic floor knowledge, pelvic floor awareness, and treatment seeking in incontinent women. It was found that more than half of the women with UI who did not seek treatment lacked pelvic floor awareness. Women with UI who answered "I am aware" to questions about pelvic floor awareness and women with UI who sought treatment had higher levels of incontinence knowledge. Another important result of our study is the identification of differences between incontinent and continent women in terms of their pelvic floor awareness, and pelvic floor and UI knowledge levels.

Based on our results, it was concluded that more than half of the women with UI in our study did not seek

Table 2. Comparison of pelvic floor awareness, pelvic floor health, and incontinence knowledge levels by incontinence status

		Incontinence Status		P
		Continent (n=82)	Incontinent (n=96)	
PFA-1	Yes	40 (48.8)	39 (40.6)	0.551
	No	39 (47.6)	53 (55.2)	
	I Don't Know	3 (3.7)	4 (4.2)	
PFA-2	Yes	21 (25.6)	31 (32.3)	0.328
	No	61 (74.4)	65 (67.7)	
PFA-2a (n=52)	toobtain knowledge	7 (35.0)	8 (28.9)	0.002
	for educational purposes	8 (40.0)	6 (20.0)	
	to seek healthcare for UI	1 (5.0)	15 (50.0)	
	for pregnancy education	4 (20.0)	1 (3.3)	
PFA-2b (n=52)	Physiotherapist	5 (23.8)	14 (45.2)	NA
	Gynecologist/Obstetrician	5 (23.8)	5 (16.1)	
	Midwife/Nurse	1 (4.8)	0 (0.0)	
	Friend/Family	0 (0.0)	1 (3.2)	
	School	2 (9.5)	2 (6.5)	
	General Practitioner	1 (4.8)	1 (3.2)	
	Other	5 (23.8)	3 (9.7)	
	Multiple Sources	2 (9.5)	5 (16.1)	
PFA-3	Yes	15 (18.3)	14 (14.6)	0.504
	No	67 (81.7)	82 (85.4)	
PFA-3a (n=29)	Physiotherapist	0 (0.0)	1 (7.1)	0.133
	Books	3 (20.0)	0 (0.0)	
	Internet	6 (40.0)	6 (42.9)	
	Multiple sources	6 (40.0)	7 (50.0)	
PFA-4	Yes	42 (51.2)	43 (44.8)	0.392
	No	40 (48.8)	53 (55.2)	
PIKQ-UI		7.0 [0.0 – 12.0]	8.0 [0.0 – 12.0]	0.033
PFHKQ		15.0 [0.0 – 27.0]	16.5 [0.0 – 27.0]	0.294

PFA-1: Have you ever heard the expression "pelvic floor muscles"? PFA-2 Have you ever received any information about pelvic floor muscles? If you have received any information, what was it for: PFA-2a and from whom did you receive it: PFA-2b, PFA-3: Have you ever done any research on pelvic floor muscles? PFA-3a:What sources did you use in your research?? PFA-4: Have you ever heard of pelvic floor muscle exercise ? PFHKQ:Pelvic Floor Health Knowledge Quiz, PIKQ-UI: Prolapse and Incontinence Knowledge Questionnaire-Incontinence subscale, UI: Urinary Incontinence

treatment, probably due to inadequate pelvic floor awareness. Cygańska et al. emphasized that women with UI had a low level of awareness about preventive treatment methods and that they needed awareness education (22). In another study, it was observed that women were aware of the need to do PFM exercises, but many did not know that these exercises should be continued throughout life; rather, these exercises were associated with pregnancy and labor (23). In a study evaluating Qatari women's awareness of UI and

Table 3. Comparison of healthcare seeking of incontinent women with and without pelvic floor awareness

		PFA-1		P
		Yes	No	
HCS-1	Yes	7 (63.6)	32 (37.6)	0.115
	No	4 (36.4)	53 (62.4)	
HCS-2	Wetness / hygiene etc.	10 (55.6)	8 (44.4)	0.456
	My social/work/outdoor life has been negatively affected	7 (43.8)	9 (56.3)	
	I have symptoms	9 (39.1)	14 (60.9)	
	I did not seek healthcare	13 (33.3)	26 (66.7)	
HCS-3	Physiotherapist	10 (71.4)	4 (28.6)	0.002
	Doctor	3 (7.7)	1 (4.2)	
	Family	3 (7.7)	9 (75.0)	
	Friend	4 (57.1)	3 (42.9)	
	Myself	8 (66.7)	4 (33.3)	
	I did not seek healthcare/nobody	11 (66.7)	36 (76.6)	
		PFA- 2		
		Yes	No	
HCS-1	Yes	7 (63.6)	24 (28.2)	0.035
	No	4 (36.4)	61 (71.8)	
HCS-2	Wetness / hygiene etc.	8 (50.0)	9 (50.0)	0.135
	My social/work/outdoor life has been negatively affected	5 (31.3)	11 (68.8)	
	I have symptoms	9 (39.1)	14 (60.9)	
	I did not seek healthcare	8 (20.5)	31 (79.5)	
HCS-3	Physiotherapist	10 (71.4)	4 (28.6)	0.002
	Doctor	2 (50.0)	2 (50.0)	
	Family	3 (25.0)	9 (75.0)	
	Friend	3 (42.9)	4 (57.1)	
	Myself	6 (50.0)	6 (50.0)	
	I did not seek healthcare/nobody	7 (14.9)	40 (85.1)	

healthcare seeking, 70.4% of women reported that UI was an abnormal condition, and that patients should consult a doctor (12). Despite having pelvic floor awareness, many women do not seek healthcare for reasons such as embarrassment, and acceptance of the condition as normal, as reported in many studies (13,24). In our study, 71.4% of the women referred by a physiotherapist for the UI treatment had heard the term "pelvic floor muscle", and 71.4% had recieved information about "pelvic floor muscles". In addition, 78.6% of these women had heard the term "pelvic floor exercises". Therefore, it appears that health professionals have made a significant contribution to the development of women's pelvic floor awareness.

In this study, it was determined that incontinent women who answered 'Yes' (I am aware) to questions about pelvic floor awareness had higher levels of knowledge than those who answered 'No' (I am not aware). Agrawal et al. evaluated the pelvic floor

Table 3. Continued

		PFA- 3		p
		Yes	No	
HCS-1	Yes	3 (27.3)	8 (72.7)	0.199
	No	11 (12.9)	74 (87.1)	
HCS-2	Wetness / hygiene etc.	4 (22.2)	14 (77.8)	0.650
	My social/work/outdoor life has been negatively affected	3 (18.8)	13 (81.3)	
	I have symptoms	3 (13.0)	20 (87.0)	
	I did not seek healthcare	4 (10.3)	35 (89.7)	
HCS-3	Physiotherapist	1 (7.1)	13 (92.9)	0.042
	Doctor	1 (25.0)	3 (75.0)	
	Family	0 (0.0)	12 (100.0)	
	Friend	2 (28.6)	5 (71.4)	
	Myself	5 (41.7)	7 (58.3)	
	I did not seek healthcare/nobody	5 (10.6)	42 (89.4)	
		PFA- 4		
		Yes	No	
HCS-1	Yes	8 (72.7)	3 (27.3)	0.059
	No	35 (41.2)	50 (58.8)	
HCS-2	Wetness / hygiene etc.	11 (61.1)	7 (38.9)	0.351
	My social/work/outdoor life has been negatively affected	7 (43.8)	9 (56.3)	
	I have symptoms	11 (47.8)	12 (52.2)	
	I did not seek healthcare	14 (35.9)	25 (64.1)	
HCS-3	Physiotherapist	11 (78.6)	3 (21.4)	0.004
	Doctor	3 (75.0)	1 (25.0)	
	Family	3 (25.0)	9 (75.0)	
	Friend	4 (57.1)	3 (42.9)	
	Myself	8 (66.7)	4 (33.3)	
	I did not seek healthcare /nobody	14 (29.8)	33 (70.2)	

HCS: Healthcare Seeking, PFA: Pelvic Floor Awareness

HCS-1: Have you ever been treated for urinary incontinence? HCS-2: Which conditions related to your incontinence bothered you and led you to seek treatment? HCS-3: Who directed you to seek treatment? PFA-1: Have you ever hear the expression "Pelvic floor muscle" before? PFA-2: Have you ever received any information about pelvic floor muscles? PFA-3: Have you ever done any research on pelvic floor muscles? PFA-4: Have you ever heard of pelvic floor muscle exercise ?

awareness of women with UI and pelvic organ prolapse by classifying the answers to the questions as "aware", "mis-aware", and "unaware", finding that less than half of women were aware of their pelvic floor muscle (25). Thus, it appears that pelvic floor awareness has a positive effect on the level of knowledge about both UI and pelvic floor health in incontinent and aware women.

Knowledge of UI has been shown to have a positive effect on seeking treatment. Siddiqui et al. reported that women's responses were "We would be more

Table 4. Comparison of Knowledge Levels of Incontinent Women with and Without Pelvic Floor Awareness

		PFHKQ	PIKQ-UI
PFA-1	Yes	20 (2 – 27)	10 (0 – 12)
	No	13 (0 – 26)	7 (0 – 12)
	p	<0.001	0.001
PFA-2	Yes	22 (4 – 27)	10 (3 – 12)
	No	14 (0 - 26)	7 (0 – 12)
	p	<0.001	<0.001
PFA-3	Yes	18.5 (6 – 25)	9.5 (5 – 12)
	No	16 (0 – 27)	7 (0 – 12)
	p	0.123	0.024
PFA-4	Yes	19.0 (2 – 27)	9.0 (0 – 12)
	No	13.0 (0 – 26)	7.0 (0 – 12)
	p	<0.001	0.006

PFHKQ: Pelvic Floor Health Knowledge Quiz, PIKQ-UI: Prolapse and Incontinence Knowledge Questionnaire-Incontinence subscale. PFA-1: Have you ever heard the expression "pelvic floor muscles"? PFA-2: Have you ever received any information about pelvic floor muscles? PFA-3: Have you ever done any research on pelvic floor muscles? PFA-4: Have you ever heard of pelvic floor muscle exercise?

Table 5. Comparison of Knowledge Levels of Incontinent Women by Seeking Healthcare

		Knowledge Levels Tests	
		PFHKQ	PIKQ-UI
HCS-1	Yes	19 (2 – 27)	10 (4 – 12)
	No	16 (0 – 27)	8 (0 – 12)
	p	0.080	0.039

HCS:Healthcare Seeking, PFHKQ: Pelvic Floor Health Knowledge Quiz, HCS-1:Have you ever been treated for urinary incontinence? PIKQ-UI: Prolapse and Incontinence Knowledge Questionnaire-Incontinence subscale.

likely to be treated if we were informed about treatment options" (13). Although the rate of UI is high in athletes with more than eight years of experience, women lacked knowledge about this issue and the treatment options. In addition, it was found that the prevalence of UI decreased to 57% in female athletes who had sufficient knowledge about UI (26). Consistent with these results (13,26), we observed that the level of knowledge about incontinence of incontinent women who sought healthcare was higher than the level of those who did not, but the level of knowledge about pelvic floor were similar in both groups. It is very important to underline that having information about incontinence contributes positively to the health care seeking and that information such as pelvic floor function, dysfunction, risk factors for PFD and treatment options should be incorporated into an education program.

Previous studies showed that women's knowledge of pelvic floor and incontinence may change due to different situations (such as being incontinent, pregnant, postmenopausal, and/or having a PFD) (23,24). However, Neels et al. evaluated the pelvic floor knowledge in groups of nulliparous, peripartum, and postmenopausal women, and reported low levels of knowledge in all groups and found that most of the nulliparous women (81%) were not informed about the pelvic floor (18,27). In our study, there were similar levels of pelvic floor knowledge and awareness among continent and incontinent women, but incontinent women's knowledge of incontinence was higher. A systematic review reported that the most commonly used questionnaire to assess the knowledge level of incontinence and prolapse is the PIKQ. (8). In the UI subscale of the PIKQ developed by Shah et al., threshold value of knowledge proficiency was reported to be 80% and above (5,28). In our study, the 80% cut-off value was taken as a reference value, in line with many previous studies (5,24), which allowed making comparison between studies and groups. Our findings showed that although the incontinent women had a higher level of knowledge about incontinence than the continent women, the PIKQ-UI was found to be below the 80% threshold, and insufficient with a rate of 66.6%. In addition, continent women in our study sought information about incontinence for educational purposes, while incontinent women were seeking a solution to their urinary incontinence problem. Kang et al. also stated that the knowledge level and attitudes of American-Korean women with UI were lower than those of the general population, and that even if they are familiar with pelvic floor muscle exercises, they believed that surgery was the best treatment (29). Incorrect or insufficient information about UI and PFD is considered a barrier to accessing treatment, and this issue should be further studied by health professionals (7,30). One of our assumptions is that it may be possible to remove barriers to health care

seeking with extensive training related to pelvic floor and UI, tailored to the age, education, occupation, and socioeconomic status of the groups. In addition, considering the differences between women regarding access to information, we think that informing women at every stage of their education will contribute to the prevention of PFD.

Another finding of our study was that incontinent women are more likely to be older, have a higher BMI, a lower level of education, more comorbidities, a higher number of pregnancies, and also to be postmenopausal. Age, BMI, level of education, presence of comorbidities, menstrual cycle, and number of pregnancies are each independent factors significantly associated with the likelihood of having UI. The physical and socio-demographic data of the incontinent women in this study reflect the UI profile.

Limitations and strengths

There are some limitations to this study. The first was that women's awareness was assessed using open-ended questions, since there is no universally-accepted standardized method to assess pelvic floor awareness in the literature. The online design of this study limited the number of participants as it could not include those who were unable to use smartphones and computers. However, organizing the study online allowed women from different cities and regions of the country to participate. The strength of the present study was that it allowed making comparison between continent and incontinent women in terms of pelvic floor awareness, pelvic floor knowledge and UI knowledge levels. To our knowledge, it was the first study to investigate the effects of pelvic floor awareness, pelvic floor, and UI knowledge levels, and healthcare seeking behavior among women with UI.

This study showed that women's knowledge of incontinence and awareness of the pelvic floor was unsatisfactory, regardless of their UI status. Therefore, it is very important for health professionals to provide information and raise awareness about the pelvic floor in order to prevent urinary incontinence. Future studies should also investigate the awareness of the related areas - pelvic organ prolapse, fecal incontinence, and sexual function- and the availability of health care for such dysfunction.

Ethical approval

This study has been approved by the Bolu Abant İzzet Baysal University Clinical Research Ethics Committee (approval date 13.04.2021, number 2021/81). Written informed consent was obtained from the participants.

Author contribution

Concept: SYY, NÖ; Design: SYY, NÖ, EDY; Data Collection or Processing: SYY, Bİ, EDY, SAT, HÇ, MBG; Analysis or Interpretation: MBG, NÖ; Literature Search: SYY, Bİ, EDY, SAT, HÇ; Writing: SYY, NÖ, MBG. All authors reviewed the results and approved the final version of the article.

Source of funding

The authors declare the study received no funding.

Conflict of interest

The authors declare that there is no conflict of interest.

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