



# Urinary Incontinence Awareness and Attitude Scale (URINAS)

## *A Reliability and Validity Study*

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### ABSTRACT

**PURPOSE:** This purpose of this study was to develop an instrument, the Urinary Incontinence Awareness and Attitude Scale (URINAS), to measure incontinence awareness and attitude, and to evaluate its reliability and validity.

**DESIGN:** Instrument development and psychometric evaluation.

**SUBJECTS AND SETTING:** The URINAS was validated in a group of individuals cared for at a family health center in Samsun, in northern Turkey. The sample comprised 637 respondents. Nearly three-fourths of participants (74.3%, n = 473) were female; their average age was 30.2 years. More than one-third of participants (35.6%, n = 227) reported urinary incontinence (UI).

**METHODS:** Participants completed a questionnaire designed for the study that queried demographic and pertinent clinical data; they also completed the URINAS and the Urogenital Distress Inventory (UDI-6). Explanatory factor analysis was then performed to evaluate validity of the URINAS. Parallel form reliability was evaluated by comparing URINAS and UDI-6 scores to determine parallel form reliability, and the Cronbach  $\alpha$  was used to evaluate internal consistency.

**RESULTS:** The URINAS comprises 26 items, divided into 5 subdimensions. The total explanatory variance of the scale is 65.3%, and the factor loadings of the scale items range from 0.38 to 0.85. A significant relationship was found in the correlation analysis between the UDI-6 used for the parallel form and the URINAS. Cronbach  $\alpha$  coefficients vary from 0.60 and 0.92.

**CONCLUSIONS:** The URINAS is a valid and reliable instrument that can be used for measuring awareness and attitudes toward UI.

**KEY WORDS:** Instrument development, Reliability and validity, Urinary incontinence.

### INTRODUCTION

Urinary incontinence (UI) is a clinically relevant and prevalent disease.<sup>1</sup> Epidemiologic studies of UI found that 44.9% of men residing in the United States, 50.5% of males residing in the United Kingdom, and 39.4% of men living in Sweden reported UI.<sup>2</sup> The prevalence among adult females in the United States is 67%, 69% of women living in the United Kingdom, and 67.1% of women residing in Sweden.<sup>2</sup> Reported incidence rates of UI in women living in Turkey vary from 21% to 45%.<sup>3,4</sup> Risk factors for UI include sex, age, obesity, and menopause.<sup>4-8</sup> Research indicates that recognition of UI as a treatable condition and seeking professional health care

when UI occurs are challenging for many adults.<sup>9,10</sup> Although UI does not create an immediate risk of mortality, it negatively influences physical health and impairs health-related quality of life (QoL).<sup>11-14</sup>

Men are more likely to seek treatment for UI than women.<sup>2,15,16</sup> Research also shows differences in health-seeking behavior based on geographic differences. A study comparing health-seeking behaviors found that the percentage of individuals with UI who consulted a health care provider was higher in the Czech Republic (63%) than in Russia (31%) and Turkey (27%).<sup>17</sup> Perceptions that UI is a normal consequence of aging also influence the proportion of affected persons seeking professional care.<sup>18,19</sup> A study of 292 women residing in Turkey found that participants did not seek out care because they did not find UI sufficiently bothersome (29.5%), they could not find time (15.1%), or they felt shame and did not want to share information about their condition with others (9.9%).<sup>9</sup> A sense of shame or stigma associated with a disease or disorder also reduces the likelihood an individual will seek out professional care.<sup>15</sup>

Research also indicates differences in the psychosocial effects of UI; 2 studies comparing the effect of UI on health-related QoL in females versus males found that male participants reported greater psychosocial distress than females.<sup>20,21</sup> Individuals experiencing UI often use self-care strategies in an attempt to manage their condition; frequently used strategies are use of body-worn absorbent products, reducing fluid intake, weight loss, keeping their feet warm, and applying warm compresses

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to the perineum.<sup>9,17,22,23</sup> A study of 2498 adults reported that 7.3% of men and 62.4% of women used body-worn absorbent products for management of UI.<sup>23</sup> A study of 292 women found that 60.6% frequently changed underclothing, 57.2% used absorbent pads, and 46.2% kept their feet warm as means of self-managing incontinence.<sup>9</sup>

Despite extensive research into multiple areas of UI, we reviewed the literature and found a paucity of studies examining awareness of UI. Being aware of the problem is an important influence on health-seeking behavior.<sup>9,15</sup> Multiple potential barriers to seeking care for UI have been documented, including genital hygiene beliefs and practices followed by Muslims in particular (“be clean before you pray”) also influence awareness and recognition of UI.<sup>24,25</sup> The aim of this study was to develop an instrument to measure awareness and attitudes toward UI and to evaluate its validity and reliability.

## METHODS

The study is based on methodological research techniques; study procedures were divided into 2 phases: instrument development and evaluation of the properties of validity and reliability.<sup>26</sup> During phase 1, concept analysis and literature review were undertaken, leading to an initial set of 61 items constructed for possible inclusion in the final instrument. These items were subjected to content validation by a panel of clinical experts; the results of this evaluation led to deletion or combination of some items, resulting in a draft instrument with 57 items. These 57 items then underwent pilot testing among a group of 10 individuals; several items were refined

based on this evaluation in order to enhance their clarity. During phase 2, the 57-item draft instrument was subjected to validity and reliability testing among a group of 637 participants. Validity testing comprised explanatory and confirmatory factor analyses; reliability testing comprised evaluation of internal consistency; and parallel reliability testing comprised using the Urogenital Distress Inventory-6 (UDI-6).<sup>27</sup> The resulting instrument comprises 26 items. Figure 1 summarizes the steps used to develop and evaluate the reliability of the URINAS.

### Study Sample

Study participants who evaluated the validity and reliability of the URINAS were recruited to receive care at the Family Health Center in Samsun, a city located in Northern Turkey. Inclusion criteria were ages 18 to 64 years and able to read and write; the presence of UI was not an inclusion criterion. Patients seeking care from January to June 2016 were approached regarding study participation. The sample size needed to address study aims was based on a power analysis with 80% strength, a 5% error margin, and an estimated 34% prevalence of UI. Study procedures were reviewed and approved by the Research Ethics Committee of the Ondokuz Mayıs University (Ethics Committee Decision Number: B.30.2.ODM.0.20.08/60). Informed consent was obtained from all study participants.

### Instrument

For purposes of this study, UDI-6 scores were compared to URINAS scores in order to evaluate parallel form reliability.

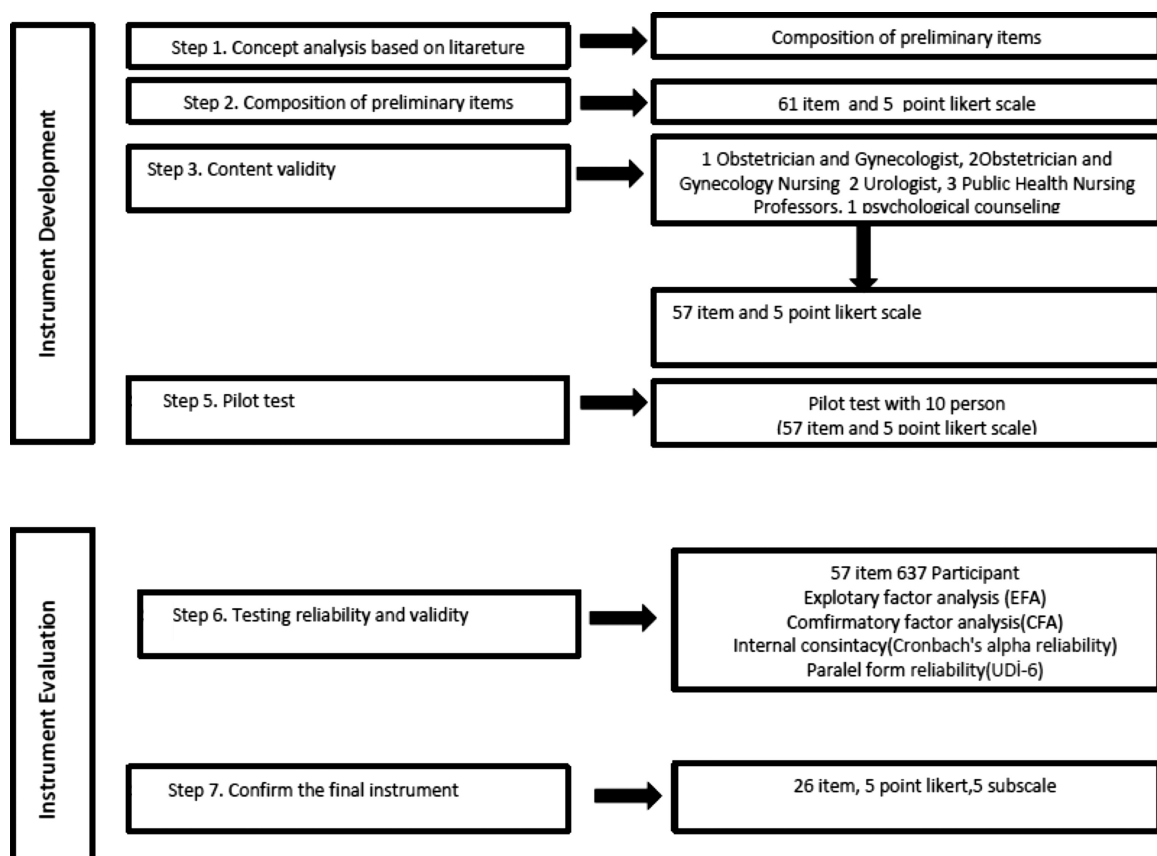


Figure 1. Study procedure flowchart. UDI-6 indicates 6-item Urogenital Distress Inventory.

The UDI-6 was originally validated in English; the Turkish language version was validated by Çam and colleagues.<sup>27</sup> The Cronbach  $\alpha$  coefficient for the Turkish language version of the UDI-6 was 0.77. The UDI-6 comprises 6 items that query voiding frequency, UI related to urgency and physical exertion (stress and urge UI), difficulty emptying the bladder, and pain or discomfort in the urogenital area. Scores vary from 0 to 24, with higher scores indicating greater botheration.

**Study Procedures**

Data collection was based on a form created for purposes of this study; it queried demographic and pertinent clinical information. The form also comprised the 57-item version of the URINAS and the short form of the UDI-6. Data were collected by the researchers via one-on-one interviews with study participants; each interview lasted 20 to 30 minutes. The forms were filled in by the researchers in a separate room at the center.

**Data Analysis**

Data were analyzed using SPSS 23 software package (Statistical Package for the Social Sciences, Chicago, Illinois). Content validity was determined using the content validity index (CVI) scoring system developed by Waltz and Bausel.<sup>26</sup> Content experts were asked to evaluate draft items for clarity and relevance to the instrument using a 1- to 4-point scale, where 1 indicates the item is not clear or relevant to the instrument and a score of 4 indicates the item has high clarity and relevance. Items with a score of 0.80 or more were identified as having robust content validity, whereas scores lower than this cut point were eliminated from the instrument.

We used 2 techniques to evaluate the reliability of the URINAS: parallel form testing and internal consistency testing via Cronbach  $\alpha$ .<sup>26,29,30</sup> Parallel form reliability is defined as a measure of similarity among scores when a participant completes an instrument that measures similar constructs. Parallel form reliability is often evaluated using a split-half technique, where items are split in half and resulting scores are correlated. Rather than using this technique, we compared URINAS scores to UDI-6 scores administered on the same day as the URINAS. Internal consistency was evaluated using the Cronbach  $\alpha$ .<sup>26</sup> Cronbach  $\alpha$  coefficients above 0.9 mean excellent; above 0.80, good; above 0.07, good and acceptable; and above 0.60, acceptable reliability.<sup>29,30</sup>

Explanatory and confirmatory factor analyses using Varimax rotation and principal component techniques were used to evaluate the construct validity of the URINAS.<sup>30,31</sup> These analyses are used to evaluate the relationship of the instrument items to the concepts to be evaluated (the 5 constructs of the instrument).

**RESULTS**

During phase 1, draft items for the URINAS were created following a literature review and concept analysis of awareness of and attitudes toward UI. The original 61 draft items created following this process were then evaluated for content validity. Items with a score 0.80 or more were identified as having content validity, while scores lower than this cut point were eliminated from the instrument.<sup>26</sup> The cumulative CVI for the URINAS was 0.90, indicating acceptable content validity. Nevertheless, 4 items were eliminated based on individual item analysis, resulting in 57 draft items.

**Phase 2: Instrument Evaluation**

Demographic and pertinent clinical characteristics of individuals used to establish validity and reliability of the URINAS are summarized in Table 1. The sample comprised 637 respondents; nearly three-fourths (74.3%, n = 473) were female. Their means age was 30.18 years (SD = 12.27; range, 18-65 years). Slightly more than one-third (35.6%, n = 227) of participants indicated they experienced UI. Among participants with UI, 66.1% (n = 150) reported telling no one they were experiencing urinary leakage and 20.7% (n = 47) reported sharing this condition with relatives.

The Kaiser-Meyer-Olkin (KMO) value was 0.90, and the Bartlett test result was  $P = .000$ , indicating robust construct validity. Item-to-total correlation scores were used to determine factor loading of each of the final 26 items; these

**TABLE 1.**  
**Demographic and Pertinent Clinical Characteristics of Participants**

	n	%
Age, mean $\pm$ SD, y	30.2 $\pm$ 12.3 (min: 18, max: 65)	
Gender		
Female	473	74.3
Male	164	25.7
Marital status		
Married	240	37.7
Unmarried	397	62.3
Educational status		
No formal education	14	2.2
Primary school	108	17.0
High school	65	10.2
University	450	70.6
Working status		
Working	249	39.1
Nonworking	388	60.9
Incontinence status		
Yes	227	35.6
No	410	64.4
Actions taken when first aware of UI (n = 227)		
Visit doctor	30	13.2
To share with relatives	47	20.7
Not do anything	150	66.1
Additional family member with UI		
Yes	237	37.2
No	400	62.8
Specific relationships with UI (n = 237)		
Grandparent/grandmother/elders	111	46.8
Mother/father	91	38.4
Sister/brother	22	9.3
Children	13	5.5

Abbreviation: UI, urinary incontinence.

**TABLE 2.**  
**URINAS Items Arranged by 5 Subdimensions of Scale, Items Scores in Study Sample, and Factor Loading Correlations for Each Item, Content Validity Indices, and Cronbach  $\alpha$  Scores for Subdimensions**

Factor	Item	Item Mean	SD	Mean $\pm$ SD	Corrected Item/Total Correlation	Cronbach $\alpha$	CVI
Factors that prevent acceptance as a health problem	1. I do not accept urination as a health problem.	3.8	1.2	29.03 $\pm$ 6.86	0.51	0.87	0.95
	2. I cannot apply to the health facility because I think that health care personnel can be prejudiced against me when I get the urine.	3.1	1.1		0.44		
	3. If I have a problem of urinary incontinence, doctor is female or male, it affects me to apply to a doctor because of this reason.	3.6	1.2		0.63		
	4. Doctors think urinary incontinence is unimportant.	3.7	1.2		0.74		
	5. I cannot go to the health facility because I feel embarrassed.	3.9	1.2		0.76		
	6. If I leak urine, I think this will be temporary.	3.4	1.3		0.56		
	7. Even if I leak urine, I cannot find time to go to the doctor because of this problem.	3.8	1.1		0.59		
	8. If I leak urine, I cannot apply to the health institution because I am shy of getting examined.	3.8	1.2		0.74		
Health motivation	9. I investigate new information to improve my health.	3.8	1.2	10.37 $\pm$ 4.87	0.73	0.92	0.90
	10. If I have a problem with urination, I'd like to identify it early.	2.2	1.1		0.85		
	11. If you leak urine, apply to a doctor.	2.1	1.1		0.77		
	12. It is very important to me that my health is good.	2.2	1.1		0.81		
	13. I think it is important to do activities that will affect my health positively.	2.0	1.1		0.83		
Coping with urinary incontinence	14. If I have a problem of urinary incontinence, I try to cope with this problem by keeping my feet warm.	3.0	1.2	5.28 $\pm$ 2.04	0.59	0.86	0.85
	15. I try to cope with the problem of urinary incontinence by trying to lift it heavily.	3.2	1.2		0.66		
	16. I try to cope with the problem of urinary incontinence by applying hot compresses to the lower part of the abdomen	3.2	1.2		0.71		
	17. I reduce my urinary incontinence problem by cleansing myself with hot water	3.3	1.1		0.73		
	18. I manage by dieting to control the problem of urinary incontinence.	3.3	1.1		0.69		
	19. I can cope with the problem of urinary incontinence by doing sports.	3.2	1.1		0.57		
Restriction	20. I do not want to go out of the house because of fear of urination.	3.2	1.2	10.24 $\pm$ 3.17	0.51	0.79	0.85
	21. I cannot fall into a deep sleep for fear of leaking urine at night	3.6	1.3		0.72		
	22. I cannot concentrate on the work I do because my fear of leaking urine keeps my mind busy all the time.	3.6	1.3		0.67		
Fear of urination	23. After sitting for a long time, I have to be careful about urinary incontinence.	2.9	1.1	12.17 $\pm$ 3.57	0.41	0.60	0.95
	24. In the environments I go, I pay attention where the toilet is.	2.7	1.2		0.42		
	25. I set my daily activities according to my need to urinate.	3.4	1.2		0.50		
	26. Before I go out of the house, I pay attention to the things I eat to avoid urination.	3.2	2.4		0.38		

Abbreviations: CVI, content validity index; URINAS, Urinary Incontinence Awareness Scale.

**TABLE 3.**  
Subdimensions of the URINAS<sup>a</sup>

Factors That Prevent Acceptance as a Health Problem		Health Motivation		Coping With Urinary Incontinence		Restriction		Fear of Urination	
Item	Factor Loading	Item	Factor Loading	Item	Factor Loading	Item	Factor Loading	Item	Factor Loading
1	0.44	9	0.69	14	0.56	20	0.52	23	0.48
2	0.48	10	0.82	15	0.59	21	0.73	24	0.50
3	0.61	11	0.74	16	0.65	22	0.70	25	0.62
4	0.68	12	0.79	17	0.71			26	0.50
5	0.71	13	0.81	18	0.67				
6	0.47			19	0.60				
7	0.52								
8	0.70								
Exp. Variance 14.9%		Exp. Variance 12.5%		Exp. Variance 12.6%		Exp. Variance 11.7%		Exp. Variance 13.6%	
Total Exp. Variance 65.3%									

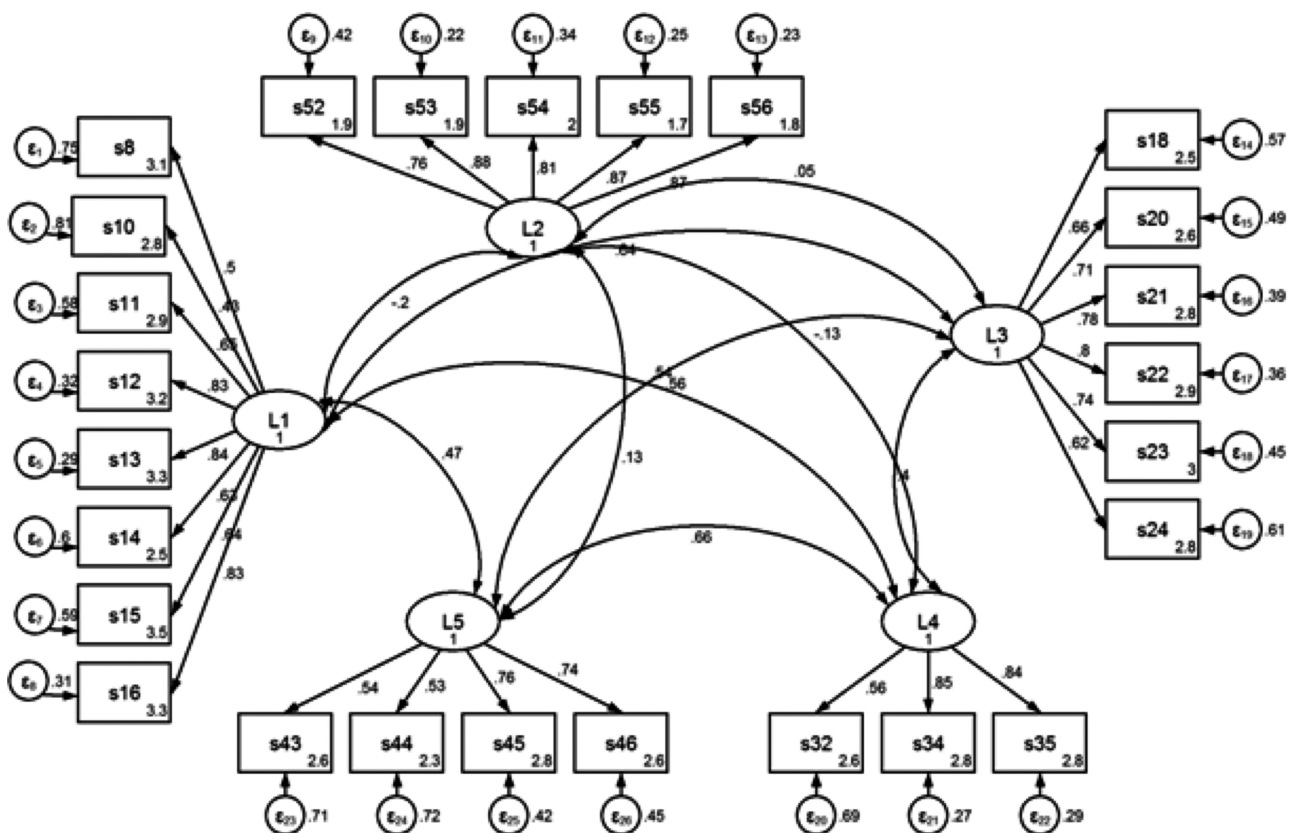
Abbreviations: Exp. Variance, explained variance; URINAS, Urinary Incontinence Awareness Scale.

<sup>a</sup>The URINAS was divided into 5 subdimensions after the explanatory factor analysis. This table shows factor loadings of the scale items and the explanatory variance of subdimensions and all subdimensions.

correlations should be more than 0.3 to be retained in the final instrument.<sup>28,31-33</sup> As a result of this analysis, 31 items with factor loading of less than 0.30 were removed from the scale, resulting in the final 26-item scale that comprises the URINAS (Table 2, column 5).

The first of the subdimensions obtained via explanatory factor analysis was factors that prevent acceptance as health

problem (items 1-8), the second was health motivation (items 9-13), the third was coping with UI (items 14-19), the fourth was restrictions related to UI (items 20-22), and the fifth subscale was fear of UI (items 23-26) (Table 3). The cumulative variance of the scale was 65.3%; the comparative fit index was 0.925, and the Tucker-Lewis Index was 0.915. The root mean square error of approximation (RMSEA) was 0.059.



**Figure 2.** Path diagram of confirmatory factor analysis of URINAS items and their respective factors. URINAS indicates Urinary Incontinence Awareness Scale.



**TABLE 4.**  
Correlations Between URINAS and UDI-6 Scores Used to Determine Parallel Form Reliability

URINAS	UDI-6	
	<i>r</i>	<i>P</i>
Factors that prevent acceptance as a health problem	−0.195	.000 <sup>a</sup>
Health motivation	−0.004	.923
Coping with urinary incontinence	−0.154	.000
Restriction	−0.110	.005
Fear of urination	−0.152	.000

Abbreviations: UDI-6, 6-item Urogenital Distress Inventory; URINAS, Urinary Incontinence Awareness Scale.

<sup>a</sup>*P* < .001.

Considered collectively, all of these indices had satisfactory values, suggesting that the conceptual model used to construct the URINAS fits the data generated (Figure 2).

The internal consistency of the URINAS was evaluated using the Cronbach  $\alpha$  for each subdimension. The Cronbach  $\alpha$  values for the scale's 5 subdimensions are summarized in Table 2. Parallel form reliability was evaluated by comparing scores of the UDI-6 and the URINAS. Analysis revealed significant relationships with 4 of the 5 subdimensions of the scale. The only subdimension that was not well correlated with the UDI-6 was health motivation (Table 4).

#### URINAS Final Form

The URINAS comprises 26 items divided into 5 subdimensions (Table 2). Item responses are forced-choice, using a 5-point Likert scale. The instrument does not generate a cumulative score; it is scored based on subdimension scores as follows: (1) factors that prevent acceptance of UI as a health problem (minimum score 8, maximum score 40); (2) health motivation (minimum score 5, maximum score 25); (3) coping with UI (minimum score 6, maximum score 30); (4) restriction related to UI (minimum score 3, maximum score 15); and (5) fear related to UI (minimum score 4, maximum score 20).

#### DISCUSSION

The URINAS was developed to evaluate awareness of and attitudes toward UI. A draft instrument, comprising 57 items, was developed based on literature review and concept analysis and revised based on content validity and pilot testing. We then performed a power analysis to determine a sufficient sample size needed to evaluate the instrument's validity and reliability. The URINAS had an explanatory variance rate between 40% and 60%, indicating sufficient ability to evaluate the constructs the scale is designed to measure.<sup>32</sup> Specifically, the 5 subdimensions of the URINAS factor and total variance comprised 65.3%.<sup>28,32</sup> The analysis also found that all items retained in the final instrument had factor loading of more than 0.30; specifically, the factor loading of the 26 items on the URINAS ranged from 0.44 to 0.82.

The URINAS is reliable based on the evaluation of internal consistency and parallel form reliability. The Cronbach  $\alpha$  for each subdimension varied between 0.60 and 0.92, indicating robust internal consistency.<sup>29,30</sup> Correlations between the UDI-6 and the URINAS were significant for all subdimensions except for health maintenance, indicating invariance of

the instrument when compared to the previously evaluated UDI-6 that measures similar constructs.

More than one-third of respondents (35.6%) participating in the study had experienced UI. This finding is broadly similar to ranges reported by Kılıç,<sup>34</sup> who found that 37.2% of female participants experienced UI, and Ghafouri and colleagues,<sup>35</sup> who reported a 20.7% prevalence of UI. More than half of participants (66.1%) who experienced UI during the study did not report seeking professional care. This proportion is broadly similar to prior studies reported where 70.7% to 89.5% of participants indicated they did not seek professional assistance when experiencing UI.<sup>19,34</sup>

#### Strengths and Limitations

This study was conducted in community-dwelling adults residing in northern Turkey, and results may not apply to females residing in other geographic areas. Translation and validation of the instrument into additional languages are urgently needed.

#### CONCLUSIONS

The URINAS is a valid and reliable measure of awareness and attitudes toward UI. Additional studies are needed to evaluate its validity and reliability in other languages and to determine its optimal use in the clinical and research settings.

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