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High-impacts Sport Athletes' Pelvic Floor Knowledge, Awareness, and Lower Urinary Tract Symptoms: A Cross-Sectional Pilot Study

Yüksek-Etkili Spor Atletlerinin Pelvik Taban Bilgisi, Farkındalığı ve Alt Üriner Sistem Semptomları: Kesitsel Bir Pilot Çalışma

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ABSTRACT Objective: Pelvic floor and lower urinary tract symptoms (LUTS) are important issues for athletes. This study aimed to evaluate high-impact sport athletes' knowledge and awareness level regarding pelvic floor and LUTS, and to compare pelvic floor knowledge and awareness levels between genders. **Material and Methods:** A total of 88 athletes were included. Pelvic floor knowledge and awareness were questioned. LUTS were assessed with the Bristol Female Lower Urinary Tract Symptoms questionnaire and the International Consultation on Incontinence Modular Questionnaire-Male Lower Urinary Tract Symptoms. Pearson chi-square and Fisher's exact tests were used. **Results:** Fifty (56.8%) athletes were in football, 21 (23.9%) were in basketball and 17 (19.3%) were in volleyball. Most of the athletes had not heard of the pelvic floor muscle (PFM) (73.9%), and did not know any PFM function (84.1%) or any treatment for the pelvic floor dysfunction (86.4%). Most of the athletes reported that they had not heard of pelvic floor muscle exercise (PFME) (84.1%) and had never performed PFME (90.9%). The pelvic floor knowledge level was higher in female athletes than in male athletes ($p<0.05$). Furthermore, the most common LUTS in female athletes were nocturia (75.9%) and urgency (75.9%) regarding the storage symptoms, and hesitance (62.1%) regarding voiding symptoms, while these symptoms in male athletes were daytime frequency (39.0%) and nocturia (20.4%) regarding the storage symptoms, and incomplete emptying (11.9%) regarding the voiding symptoms. **Conclusion:** The athletes had limited pelvic floor knowledge and awareness. Female athletes had more LUTS than male athletes.

Keywords: Athletes; lower urinary tract symptoms; pelvic floor

ÖZET Amaç: Pelvik taban ve alt üriner sistem semptomları (AÜSS) atletler için önemli konulardır. Bu çalışma, yüksek-etkili spor atletlerinin pelvik taban ile ilgili bilgi ve farkındalık düzeylerini ve AÜSS'lerini değerlendirmeyi ve cinsiyetler arasında pelvik taban bilgi ve farkındalık düzeylerini karşılaştırmayı amaçladı. **Gereç ve Yöntemler:** Toplam 88 atlet dâhil edildi. Pelvik taban bilgisi ve farkındalığı sorgulandı. AÜSS, Bristol Kadın Alt Üriner Sistem Semptom Anketi ve Uluslararası İnkontinans Konsültasyon Sorgulama Anketi-Erkek Alt Üriner Sistem Semptomları ile değerlendirildi. Pearson ki kare ve Fisher's exact testleri kullanıldı. **Bulgular:** Elli atlet (%56,8) futbolda, 21'i (%23,9) basketbolda ve 17'si (%19,3) voleybolda yer almaktaydı. Atletlerin çoğu pelvik taban kaslarını (PTK) duymamıştı (%73,9), PTK fonksiyonunu (%84,1) ve pelvik taban disfonksiyonu tedavisini (%86,4) bilmiyordu. Atletlerin çoğu pelvik taban kas egzersizlerini (PTKE) duymadığını (%84,1) ve hiç PTKE yapmadığını (%90,9) bildirdi. Kadın atletlerde pelvik taban bilgi düzeyi erkek atletlere göre daha yüksekti ($p<0,05$). Ayrıca kadın atletlerde en sık görülen AÜSS, depolama semptomlarına göre noktüri (%75,9) ve aciliyet hissi (%75,9), işeme semptomlarına göre duraksama (%62,1) iken; erkek sporcularda bu semptomlar depolama semptomlarına göre gündüz işeme sıklığı (%39,0) ve noktüri (%20,4), işeme semptomlarına göre tam boşaltamama (%11,9) idi. **Sonuç:** Atletler sınırlı pelvik taban bilgisi ve farkındalığına sahipti. Kadın atletler, erkek atletlerden daha fazla AÜSS'ye sahipti.

Anahtar Kelimeler: Atletler; alt idrar yolu semptomları; pelvik taban

Pelvic floor, which spans the entire pelvic cavity, consists of active, passive, and neural structures.[1] Pelvic floor muscles (PFM) support the abdomino-pelvic organs, contribute to the sacroiliac joints and trunk stability, and control bladder and bowel continence.[2] Pelvic floor dysfunctions also include urinary incontinence (UI), anal incontinence, pelvic organ prolapse, lumbo-pelvic pain, and sexual dysfunction.[2]

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There are some risk factors for the pelvic floor dysfunction such as aging, pregnancy, childbirth, obesity and high-impact sports.[3-7]

There are two opposite hypotheses related to the PFM in athletes. The first hypothesis has been that the PFM of athletes is thick and strong by sports practice because of the coactivation with abdominal muscles. The second hypothesis, however, has been that the PFM of athletes is weak by overloading and stretching, especially in high-impact sports.[7] The prevalence of UI has been seen higher in high-impact sports (including running and jumping activities) or weight-bearing sports with heavy mechanical loading (e.g., ball games, gymnastics, and bodybuilding) than in low-impact sports (e.g., swimming and cycling).[8]

Furthermore, in the literature, there exist various studies investigating knowledge and awareness about the PFM, their functions/dysfunction, and treatment options for pelvic floor dysfunction in general female populations.[9-13] However, most of these studies have demonstrated limited knowledge and awareness about this issue. According to our knowledge, there are insufficient studies on pelvic floor knowledge and awareness in athletes.[7,14]

Lower urinary tract symptoms (LUTS) affected by the PFM function are also mainly categorized as storage and voiding/postvoiding symptoms according to the micturition cycle.[15,16] The presence and prevalence of UI, one of the LUTS, has been generally investigated in female athletes.[7,8,17] Studies examining the LUTS in detail in both male and female athletes engaged in high-impact sports are need.

Recent studies which have been conducted specifically in high-impact sport athletes have also showed considerable gaps in the pelvic floor knowledge and awareness level and the LUTS.[8,14,17] To the best of our knowledge, only one of the studies included both male and female athletes.[14] Thus, the current study aimed to evaluate the pelvic floor knowledge and awareness level and the LUTS of both female and male athletes and also to compare the pelvic floor knowledge and awareness levels between genders.

MATERIAL AND METHODS

STUDY DESIGN

In this study, a cross-sectional study design was used. The study was conducted in accordance with the rules of the Declaration of Helsinki. Ethical approval of the study was obtained from Ankara Yıldırım Beyazıt University Ethics Committee (05.02.2020/09).

PARTICIPANTS

The study included athletes. The inclusion criteria were: being female/male athletes aged between 18 and 35 years, practitioners of high-impact sports, with a minimum training history of 1 year, with a minimum frequency of twice a week and 1 hour a day, and being a volunteer to participate in the study.[18] The exclusion criteria of the study were: being unable to complete the assessment, having any neurological diseases, being pregnant, or having a history of urogynecological surgery. Ninety-five athletes were assessed for eligibility. Seven athletes were excluded for not meeting the inclusion criteria [refused to participate (n=5), incomplete questionnaire (n=2)]. Totally 88 athletes [female (n=29), male (n=59)] completed the study. All athletes signed informed consent forms.

ASSESSMENT

Physical and demographic information, sports types, and training features of the athletes were collected through face-to-face interviews. All assessments took approximately 15-20 minutes for each athlete. The athletes' pelvic floor knowledge and awareness level and LUTS were assessed.

Pelvic Floor Knowledge and Awareness

The levels of knowledge and awareness of pelvic floor of the athletes were questioned as "Have you ever heard of PFM?", "Where is the PFM located in our body?", "What are PFM functions?", "What are pelvic floor dysfunctions?", "What are the treatment options for pelvic floor dysfunction?", "Have you ever heard of pelvic floor muscle exercise (PFME)?", "Have you ever performed PFME?", "How do you perform the PFME?".

Lower Urinary Tract Symptoms

These symptoms of the female athletes were assessed by the Turkish version of the Bristol Female Lower Urinary Tract Symptoms (BFLUTS) questionnaire, which consists of 19 items.[19] The questionnaire included five sub-scales: incontinence symptoms, voiding symptoms, storage symptoms, sexual function and quality of life. The sum of the score of the questionnaire ranges from "0" to "72". A higher total score indicates more severe symptoms.

LUTS of the male athletes were assessed by the Turkish version of the International Consultation on Incontinence Modular Questionnaire-Male LUTS (ICIQ-MLUTS).[20] This questionnaire assesses prevalence and bother of 13 urinary symptoms (voiding, storage, daytime frequency, and nocturia). Prevalence of these symptoms was scored on a scale from 0 to 4. For 11 symptoms, outcomes were ordinal: score 0 indicates "never" and score 4 "all the time"; while for daytime frequency score 0 means "1-6 times" and score 4 "≥13 times" and for nocturia a score 0 indicates "0 times" and score 4 "≥4 times". Bother of each of the 13 symptoms was scored on a scale from 0 (not at all) to 10 (a great deal). The presence of these symptoms was defined as a score ≥3 on the presence scale; whereas, the presence of bothersome of these symptoms was defined as a score ≥5 on the bother scale.[21] In addition, daytime frequency was defined as ≥7-8 voids per day, and nocturia was defined as ≥1 voids per night.[2]

STATISTICAL ANALYSES

Sample size calculation was based on the general recommendations of the current literature for pilot studies, which suggests that the use of a study population ranging from 40 to 80 for each study group is enough for a pilot study.[22,23] According to Whitehead et al., a sample size of at least 25 subjects per single group was adequate for the assessment of a small standardized effect size. Hence, in our study, 88 athletes were included.[24]

IBM SPSS Statistics 21.0 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, New York, USA: IBM Corp.) was used for the data analysis. The variables were investigated using visual and analytical methods to determine whether or not they were normally distributed. Descriptive statistics were calculated for all variables and normally distributed data are presented as mean±standard deviation (SD), non-normal distributions are presented as median (minimum; maximum), and ordinal variables are indicated as frequency (n) and percentage (%). Pearson chi-square and Fisher's exact tests were used to compare the pelvic floor knowledge and awareness levels between genders. The significance level was considered as $p<0.05$.

RESULTS

The physical characteristics, marital status, parity, sport types, and training features of athletes are shown (Table 1). Fifty (56.8%) athletes were in football, 21 (23.9%) were in basketball, and 17 (19.3%) were in volleyball. Daily average training time was 2.0 [(1.0);(5.0)] hours.

The athletes' knowledge and awareness levels about pelvic floor are presented (Table 2). Only 23

TABLE 1: Physical characteristics, marital status, parity, sports types, and training features of the athletes.

	Athletes (n=88) Median [(minimum);(maximum)]
Physical characteristics	**X±SD**
Age (years)	20.0 [(18.0);(32.0)]
Weight (kg)	70.0 [(47.0);(105.0)]
Height (cm)	178.0 [(150.0);(207.0)]
Body mass index (kg/m2)	21.96±2.03
Marital status	n (%)
Married	0 (0)
Single	88 (100.0)
Parity (for female athletes)	n (%)
None	29 (100.0)
One or more	0 (0.0)
Sports types	n (%)
Football	50 (56.8)
Basketball	21 (23.9)
Volleyball	17 (19.3)
Training features	Median [(minimum);(maximum)]
Starting age for sports (years)	10.0 [(6.0);(16.0)]
Daily average training time (hours)	2.0 [(1.0);(5.0)]
Workout on the court (minute/week)	230.0 [(60.0);(900.0)]
Strength training (minute/week)	60.0 [(0.0);(360.0)]
Jump training (session/week)	2.0 [(1.0);(12.0)]
Abdominal exercise (session/week)	3.0 [(1.0);(6.0)]

SD: Standard deviation.

TABLE 2: The athletes' levels of knowledge and awareness about pelvic floor.

	Total n (%)	Female athletes n (%)	Male athletes n (%)	p value
Heard of PFM?				
Yes	23 (26.1)	8 (34.8)	15 (65.2)	0.828[a]
No	65 (73.9)	21 (32.3)	44 (67.7)	
Where is the PFM located in our body?				
Inferior pelvic outlet	11 (12.5)	7 (63.6)	4 (36.4)	0.036[e]
Bladder exit	4 (4.5)	1 (25.0)	3 (75.0)	1.000[e]
Bowel exit	1 (1.1)	0 (0.0)	1(100.0)	1.000[e]
Bladder around	3 (3.4)	2 (66.7)	1 (33.3)	0.252[e]
Don't know	73 (83.0)	22 (30.1)	51 (69.9)	0.238[e]
What are PFM functions?				
Urine control	10 (11.4)	5 (50.0)	5 (50.0)	0.287[e]
Feces/flatus control	6 (6.8)	2 (33.3)	4 (66.7)	1.000[e]
Support for pelvic organs (bladder, uterus, bowel)	9 (10.2)	7 (77.8)	2 (22.2)	0.005[e]
Important in sexual function	8 (9.1)	6 (75.0)	2 (25.0)	0.014[e]
Important in lumbo-pelvic stability	3 (3.4)	2 (66.7)	1 (33.3)	0.252[e]
Allows birth	5 (5.7)	5 (100.0)	0 (0.0)	0.003[e]
Don't know	74 (84.1)	21 (28.4)	53 (71.6)	0.060[e]
What are pelvic floor dysfunctions?				
Urinary incontinence	8 (9.1)	5 (62.5)	3 (37.5)	0.109[e]
Anal incontinence	4 (4.5)	2 (50.0)	2 (50.0)	0.596[e]
Pelvic organ prolapses	4 (4.5)	4 (100.0)	0 (0)	0.010[e]
Sexual dysfunctions	7 (8.0)	5 (71.4)	2 (28.6)	0.037[e]
Lumbo-pelvic pain	3 (3.4)	3 (100.0)	0 (0.0)	0.033[e]
Don't know	77 (87.5)	23 (29.9)	54 (70.1)	0.167[e]
What are the treatment options for pelvic floor dysfunction?				
Pelvic floor muscle exercise	10 (11.4)	7 (70.0)	3 (30.0)	0.013[e]
Medication	2 (2.3)	1 (50.0)	1 (50.0)	1.000[e]
Physiotherapy	8 (9.1)	5 (62.5)	3 (37.5)	0.109[e]
Surgical treatment	2 (2.3)	1 (50.0)	1 (50.0)	1.000[e]
Don't know	76 (86.4)	22 (28.9)	54 (71.1)	0.055[e]
Heard of PFME?				
Yes	14 (15.9)	6 (42.9)	8 (57.1)	0.536[e]
No	74 (84.1)	23 (31.1)	51 (68.9)	
Ever exercised PFM?				
Yes	8 (9.1)	4 (50.0)	4 (50.0)	0.431[e]
No	80 (90.9)	25 (31.2)	55 (68.8)	
How do you do the PFME?				
Pulling in the belly	3 (3.4)	1 (33.3)	2 (66.7)	1.000[e]
By bringing the legs together	1 (1.1)	1 (100.0)	0 (0.0)	0.330[e]
Squeezing the hips	3 (3.4)	1 (33.3)	2 (66.7)	1.000[e]
Holding the breath and pushing	0 (0)	0 (0.0)	0 (0.0)	-
Squeezing urine or gas like holding it	9 (10.2)	6 (66.7)	3 (33.3)	0.054[e]
None of them	0 (0)	0 (0.0)	0 (0.0)	-
Don't know	77 (87.5)	23 (29.9)	54 (70.1)	0.167[e]

[a]Pearson Chi-square Test; [e]Fisher's Exact Test; PFM: Pelvic floor muscles; PFME: Pelvic floor muscle exercises.

athletes (26.1%) had heard of the PFM. Seventy-three athletes (83.0%) could not identify the location of the PFM. Most of the athletes (84.1%) did not identify any PFM function. The most given answer to the pelvic floor dysfunction was "UI" (9.1%). Most of the athletes (86.4%) did not know any treatment for

the pelvic floor dysfunction. Most of the athletes reported that they had not heard of PFME (84.1%), never performed PFME (90.9%), and did not know how to perform PFME (87.5%). The pelvic floor knowledge level was higher in female athletes than in male athletes ($p<0.05$).

The LUTS symptoms of the female athletes according to the BFLUTS were presented (Table 3). An investigation of the urinary storage symptoms showed that the most common symptoms were nocturia (75.9%) and urgency (75.9%). The most common urinary voiding symptoms was hesitancy (62.1%). Among the UI symptoms, the prevalence of urgency UI was 17.2%. An assessment of the quality of life showed that the most common bother was "not going to places where there is no toilet" (31.0%).

The LUTS symptoms of the male athletes according to the ICIQ-MLUTS were presented (Table 4). Incomplete emptying (11.9%) regarding the voiding symptoms, and increased daytime frequency (≥7-8 times) (39.0%) and nocturia (≥1 times) (20.4%) regarding the storage symptoms were the most common symptoms in male athletes. The most bothersome symptom was incomplete emptying (8.5%).

DISCUSSION

In the present study, it was observed that most of the athletes had not heard of the PFM, and they did not know where the muscles were located, their functions, pelvic floor dysfunction, and treatment options for these dysfunctions. However, female athletes had more pelvic floor knowledge level than male athletes. The rates of the athletes' knowing about and performing the PFME were also low. In addition, the most common LUTS in female athletes were nocturia and urgency (of the storage symptoms) and hesitancy (of the voiding symptoms), whereas the most common LUTS in male athletes were increased daytime frequency and nocturia (of the storage symptoms) and incomplete emptying (of the voiding symptoms). The LUTS, especially storage symptoms, were observed more in female athletes than in male athletes. Moreover, these symptoms affected female athletes in larger scale than male athletes.

TABLE 3: The frequency and scores of BFLUTS subdimensions among female athletes (n=29).

BFLUTS		n*	%	Score Median [(minimum);(maximum)]
Storage	Nocturia (>1 times)	22	75.9	3.0 [(0.0);(7.0)]
	Rush to toilet (urgency)	22	75.9	
	Bladder pain	13	44.8	
	Frequency (≤3 h between voids)	20	69.9	
Incontinence	Leaking before getting to toilet (urgency UI)	5	17.2	0.0 [(0.0);(10.0)]
	Frequency of incontinence	4	13.8	
	Stress UI (when physically active, coughing, etc.)	2	6.9	
	Unpredictable incontinence (no reason & feeling)	2	6.9	
	Nocturnal incontinence (leaking when asleep)	1	3.4	
Voiding	Hesitancy (delay to start urinate)	18	62.1	2.0 [(0.0);(4.0)]
	Strain to urinate	7	24.1	
	Intermittency (stop and start more than once)	17	58.6	
Sexual function	Effect of urine problem on sexual life	0	0	0.0 [(0.0);(0.0)]
	Incontinence during sex	0	0	
Quality of life	Changing clothes during the day due to urinary incontinence	1	3.4	0.0 [(0.0);(4.0)]
	Reducing the amount of fluid to reduce urine complaints	4	13.8	
	Effect of urine problem on daily tasks (cleaning, lifting things etc.)	1	3.4	
	Not going to places (theater, cinema etc.) where there is no toilet	9	31.0	
	Effect of urine problem on life	3	10.3	

*Responses for BFLUTS symptoms other than none/never were accepted as presence of the symptom in any degree of severity. Values are expressed in percentage;
BFLUTS: Bristol Female Lower Urinary Tract Symptoms questionnaire; UI: Urinary incontinence.

TABLE 4: The frequency and scores of ICIQ-MLUTS subdimensions among male athletes (n=59).

ICIQ-MLUTS		n*	%	n**	%	Score median [(minimum);(maximum)]
Voiding	Hesitancy	0	0	0	0	2.0 [(0.0);(9.0)]
	Straining	0	0	0	0	
	Weak stream	0	0	0	0	
	Intermittency	1	1.7	1	1.7	
	Incomplete emptying	7	11.9	5	8.5	
Storage	Urgency	5	8.5	2	3.4	2.0 [(0.0);(15.0)]
	Urgency UI	1	1.7	0	0	
	Stress UI	1	1.7	0	0	
	Unexplained UI	0	0	0	0	
	Nocturnal UI	1	1.7	0	0	
	Postmicturition dribble	4	6.8	2	3.4	
Daytime frequency	1-6 times	36	61.0	0	0	0.0 [(0.0);(3.0)]
	7-8 times	**18**	**30.5**	**1**	**1.7**	
	9-10 times	**4**	**6.8**	**2**	**3.4**	
	11-12 times	**1**	**1.7**	**1**	**1.7**	
	≥13 times	**0**	**0**	**0**	**0**	
Nocturia	0 times	47	79.7	0	0	0.0 [(0.0);(2.0)]
	1 times	**8**	**13.6**	**0**	**0**	
	2 times	**4**	**6.8**	**2**	**3.4**	
	3 times	**0**	**0**	**0**	**0**	
	≥4 times	**0**	**0**	**0**	**0**	

*Responses for MLUTS symptoms were accepted as voiding score ≥3 and storage score ≥3 on the presence scale 0-4; **Score ≥3 on presence scale 0-4+score ≥5 on bother scale 0-10;
*Daytime frequency and nocturia shown on the presence scale 0-4; abnormal symptoms (score ≥1) are indicated in bold;
**Score ≥5 on bother scale 0-10 for increased daytime frequency and nocturia; Values are expressed in percentage;
ICIQ-MLUTS: International Consultation on Incontinence Modular Questionnaire-Male Lower Urinary Tract Symptoms; UI: Urinary incontinence.

Previous studies have suggested that insufficient knowledge and awareness related to pelvic floor anatomy, PFM function/dysfunction, treatment options, and PFME have been the largest barriers to seeking health care.[13,25] Furthermore, pelvic floor knowledge and awareness are important to improve compliance with pelvic floor dysfunction or LUTS treatments, and may contribute to behavioral changes.[26] However, young, nulliparous women in general, and athletes in particular, have low level of knowledge about the pelvic floor and little knowledge about how to perform the PFME.[14] Skaug et al. found that Norwegian male and female powerlifters and olympic weightlifters had limited knowledge of the PFM and the prevalence of pelvic floor dysfunction was high.[14] Cardoso et al. detected that the prevalence of the practice of PFME was poor in female athletes due to the lack of knowledge of the existence of these exercises.[17] In the present study, the level of PFM knowledge and awareness in the football, basketball, and volleyball athletes were low. However, compared to male athletes, female athletes had a higher pelvic floor knowledge level related to the location of the PFM, their functions, pelvic floor dysfunction, and PFME as a treatment option for these dysfunctions. The rate of knowing and performing the PFME was also very low. Although the PFMs are striated muscles, the pelvic floor has been considered as an ignored region for the athletes. In this context, the athletes should be informed about the pelvic floor health in general and especially the PFME should be included in training programs of high-impact sport athletes.

The LUTS, including many symptoms, is an overarching concept. In the literature, female athletes have 3 times the risk of UI compared with non-athlete controls.[7] Cardoso et al. found that mixed UI has been more

prevalent than pure stress UI and urgency UI in female athletes performing high-impact sports.[17] Reis et al. put forward a 50% prevalence of stress UI in basketball athletes and 30% in volleyball athletes.[27] Rodríguez-López et al. also explained a 50% prevalence of UI in female athletes and 30% in male athletes.[28] Moreover, it was detected that the prevalence of stress UI was the type of UI most frequently experienced by elite athletes (66.1% in females; 24.1% in males). In the current study, the LUTS were questioned in detail in male and female athletes, and it was found that the most common LUTS in female athletes were nocturia and urgency (of the storage symptoms) and hesitancy (of the voiding symptoms), whereas the most common LUTS in male athletes were increased daytime frequency and nocturia (of the storage symptoms) and incomplete emptying (of the voiding symptoms). Furthermore, the most common type of UI in female athletes was urgency UI (17.2%), while the type of UI seen in male athletes were similar, such as urgency UI (1.7%), stress UI (1.7%), and nocturnal UI (1.7%). In this study, female athletes had more symptoms of UI than male athletes, and also female and male athletes were more affected by storage and voiding symptoms, respectively. According to these findings, it may be important to assess the LUTS in detail to improve sports performance and quality of life in high-impact sport athletes.

There were some limitations of this study. First, given that only Turkish athletes at the national level were included and that no data on ethnicity were collected, the results are not generalizable to athletes from other ethnicities. Second, we presented findings of a cross-sectional pilot study due to the coronavirus disease-2019 pandemic. Further studies related to this issue with a larger sample size are needed. Third, there was an item related to mixed UI in the LUTS questionnaires used in this study. Future studies related to the LUTS and athletes could be considered.

CONCLUSION

In conclusion, it was seen that the athletes' knowledge and awareness regarding PFM, their functions/dysfunctions, and the treatment options for pelvic floor dysfunction were insufficient. However, female athletes had more pelvic floor knowledge than male athletes. The rates of knowing and performing the PFME in the athletes were also low. The most common LUTS in female athletes were nocturia and urgency (of the storage symptoms) and hesitancy (of the voiding symptoms), whereas the most common LUTS in male athletes were increased daytime frequency and nocturia (of the storage symptoms) and incomplete emptying (of the voiding symptoms). The LUTS, especially storage symptoms, were observed more in female athletes than in male athletes. The athletes should be informed about the pelvic floor health and the LUTS should be taken into account in high-impact sport athletes.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Şeyda Toprak Çelenay;* ***Design:*** *Şeyda Toprak Çelenay, Elif Sena Düşgün, Ahmet Rasit Değirmendereli;* ***Analysis and/or Interpretation:*** *Şeyda Toprak Çelenay, Elif Sena Düşgün, Ahmet Rasit Değirmendereli;* ***Writing the Article:*** *Şeyda Toprak Çelenay, Elif Sena Düşgün, Ahmet Rasit Değirmendereli.*

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