Cukurova Medical Journal
ÇUKUROVA ÜNİVERSİTESİ TIP FAKÜLTESİ

Cukurova Med J 2019;44(4):1392-1399
DOI: 10.17826/cumj.527322

ARAŞTIRMA / RESEARCH

Relationship between lower urinary system complaints and healthy life behaviors among women aged 50 and over

Elli yaş ve üzeri kadınlarda alt üriner sistem şikâyetleri ile sağlıklı yaşam biçimi davranışları ilişkisi

Handan Özcan[1], Nezihe Kızılkaya Beji[2]

[1]University of Health Sciences, Faculty of Health Sciences, Department of Midwifery, Istanbul, Turkey
[2]Biruni University, Faculty of Health Science, Department of Women's Health and Diseases Nursing, Istanbul, Turkey

Cukurova Medical Journal 2019;44(4):1392-1399.

Abstract

Purpose: This study was planned to determine the lower urinary tract complaints and healthy lifestyle behavior of women aged 50 and over living in Gümüşhane, Turkey.

Materials and Methods: The population of this cross-sectional design study consisted of the female population aged 50 and over in Gümüşhane (5430), and the sample comprised of 543 women calculated using stratified sampling method according to age groups. In order to collect the data, a questionnaire investigating participants' socio-demographic characteristics, obstetric gynecological, chronic disease stories and general health behavior, The Bristol Female Lower Urinary Tract Symptoms Scale (B-FLUTS) and Healthy Life Style Behavior Scale (HLSBS) were used. The data were evaluated with a statistical package program.

Results: The mean age of the women was 64.55±11.197, the mean age of menopause was 47.72±5.11. The BLUTS total score was 16.43±11.06, and the total score of HLSBS scale was 125.76±22.74. The BFLUTS total score was associated with the women's work status (those who are employed are less likely to have symptoms), advanced age, marital status (those living apart have more symptoms), low income status, low educational status, having unemployed spouse, having given birth at home, constipation, chronic disease history, daily pad use, increased pregnancy, birth and miscarriage.

Conclusion: As the mean of HLSBS total score increased, Spiritual Development BFLUTS score decreased. Before any medical treatment, the women with lower urinary tract complaints should be analyzed by evaluating their lifestyle in order to reduce the complaints.

Keywords: Healthy behavior; lower urinary tract symptoms; risk factors; woman

Öz

Amaç: Çalışma, Gümüşhane'de yaşayan 50 yaş ve üzeri kadınların, alt üriner sistem şikâyetlerini ve sağlıklı yaşam biçimi davranışlarını belirlemek amacıyla planlandı.

Gereç ve Yöntem: Kesitsel tipte olan çalışmanın evrenini; Gümüşhane il merkezindeki 50 yaş ve üzeri kadın nüfusu (5430), örneklemini; yaş gruplarına göre tabakalı örneklem yöntemiyle hesaplanan 543 kadın oluşturmaktadır. Veri toplamak amacıyla; katılımcıların sosyo-demografik özellikleri ile obstetrik, jinekolojik, kronik hastalık öyküsü ve genel sağlık davranışlarını sorgulayan soru formu, Bristol Kadın Alt Üriner Yol Semptomları Soru Formu (B-FLUTS) ve Sağlıklı Yaşam Biçimi Davranışları Ölçeği (HLSBS) kullanıldı. Elde edilen veriler, istatistik paket programı ile değerlendirildi.

Bulgular: Kadınların yaş ortalaması 64,55±11.197, menopoz yaş ortalaması 47.72±5.11'dir. BFLUTS toplam puanı 16,43±11,06, HLSBS ölçek toplam puanı 125,76±22,74'dür. Kadınların BFLUTS toplam puanı ile çalışma durumu, ileri yaş, medeni durum, düşük gelir düzeyi, düşük eğitim seviyesi, eşin çalışmıyor olması, evde doğum yapmış olma, herhangi bir jinekolojik ameliyat geçirme durumu, kabızlık, kronik hastalık öyküsü, günlük ped kullanımı, artan gebelik, doğum ve düşük sayısı ile ilişkilidir.

Sonuç: BFLUTS Toplam puanı artınca, HLSBS Manevi Gelişim alt boyut puanı azalmaktadır. Tıbbi tedaviden önce, alt üriner sistem şikâyetleri olan kadınlarda şikâyetleri azaltmak için yaşam tarzı değerlendirilerek gözden geçirilmelidir.

Anahtar kelimeler: Alt üriner sistem şikâyetleri, sağlıklı yaşam biçimi davranışları, risk faktörleri

Yazışma Adresi/Address for Correspondence: Dr. Handan Özcan, University of Health Sciences, Faculty of Health Sciences, Department of Midwifery, Istanbul, Turkey e-mail: hndnozcn@hotmail.com
Geliş tarihi/Received: 14.02.2019 Kabul tarihi/Accepted: 17.06.2019 Çevrimiçi yayın/Published online: 15.09.2019

INTRODUCTION

Lower urinary tract symptoms (LUTS) include the problems related to storing urine such as nocturia, urinary frequency, urgency, urinary incontinence; the symptoms of urine evacuation such as weak urinary stream, forked-interrupted urine flow, a late start to urinate, and post-urination symptoms such as lack of complete urination and dripping[1].

It has been reported that one out of five adult women has moderate LUTS complaints and they cause discomfort that affects the daily activities of one out of ten.[2] The overall prevalence of LUTS among women is 67% and the insidence increases with age. Besides, its prevalence among women is found significantly higher than many other chronic diseases[3,4].

In the related studies, it has been determined that urinary incontinence (UI) is 13%, nocturia is (≥2 times/night) 24%, urgency 12.8%, incidence 7.4%, urination symptoms (intermittent urination, slow urination, urination as a leakage) 19.5%, urinary evacuation problems (inability to fully discharge, feeling of fullness) 4.2%, overactive bladder (OAB) 11.8% and any kind of LUTS 48.1%[4-6].

In western countries, the large scale studies related to LUTS revealed that its prevalence increased from 13% up to 76%[2,7]. The related studies carried out in Turkey indicated that urinary urgency, urinary incontinence, nocturia and prevalence were 36.1%, 32,4%, 27.1% and 22.8% respectively[8].The risk factors for LUTS have been listed as being in menopausal period, giving birth to an infant over 4 kg, vaginal delivery, more than 3 deliveries, having episiotomy, chronic constipation, urinary tract infections, race, family history, chronic diseases, hysterectomy, genetic structure and dietary habits[3,8-11].

In the literature, lifestyle changes are in the behavioral treatment of LUTS as a component of conservative treatment. Lifestyle and behavioral measures are effective in reducing urinary tract symptoms such as urinary incontinence, overactive bladder and urinary tract infections[12]. Considered as a component of conservative treatment, lifestyle changes are also included in the published international evidence-based guidelines (European Association of Urology-EAU-2014) and randomized controlled studies as the first-line therapy[13].

The purpose of the lifestyle changes is to alter the habits/ risk factors and the environment that trigger the pelvic floor dysfunction symptoms or increase the symptoms by defining the habits of an individual (smoking, exercise, nutrition and so on); and to regain the control of the pelvic floor[14]. The direct or indirect lifestyle changes such as weight loss, smoking cessation, diet, the reduction of bladder irritants, the management of fluid intake, physical exercises, bladder training, and the prevention of constipation are important in the management of LUTS[15-17].

In the literature review, there are community based researches to determine the lower urinary tract symptoms and risk factors seen in women in our country. However, there are no studies investigating the healthy lifestyle behaviors of women with complaints. This study was planned to determine the lower urinary tract complaints and healthy lifestyle behavior of the women aged 50 and over in Gümüşhane, Turkey.

MATERIALS AND METHODS

The universe of this cross-sectional study consisted of the women aged 50 and over in Gümüşhane, Turkey. According to the 2014 TSI (Turkish Statistical Institute) data, the female population aged 50 and over in Gümüşhane was 5430. As a result of stratified sampling method (%10) according to the age groups. The sampling of the study was calculated as 543 women. For the implementation of the research, the permission was obtained from Istanbul University, the Clinical Research Ethics Committee of Faculty of Medicine (Approval number 83045809/604.01-02), and for the implementation of the research, institutional permission was taken from Gümüşhane Public Health Institution.

The inclusion criteria were being a woman aged 50 and over, participating in the study voluntarily and giving verbal consent in order to carry out the research (n=543). Whereas rhe exclusion criteria were the presence of a physical or mental disability which can cause incoordination, the presence of visual, auditory and cognitive impairment which can be an obstacle to communicate, refusal to participate in the study and the women who could not be reached three times (n=36).

The data were collected between 1st February and 30th November 2015. At this stage, the women were informed about the purpose of the study and verbal consent was obtained from those who agreed to

participate in the study voluntarily. The data were collected by the face-to-face interview method by the researcher who read the survey questions. Research data was collected in 3 stages.

Measures

Introductory Information Form

Women's socio-economic status, obstetric history and general health status are questioned.

The Bristol Female Lower Urinary Tract Symptom Scale (BFLUTS)

Scale was developed to determine lower urinary tract symptoms, sexual life and quality of life. It consists of 19 items. At least 0 and maximum 71 points can be obtained from the questionnaire. Increased score from the scale; implies that quality of life, sexual life is more adversely affected and symptoms are more severe[18-20].

Health Promotion Life Style Profile/HPLSP) The scale measures health behaviors developed in relation to healthy lifestyle. The scale consists of a total of 52 items and has 6 sub-factors. The lowest score is 52 and the highest is 208 points. As the score from the scale increases, the level of positive health behavior increases[21-22].

The Cronbach's alpha reliability coefficients for all dimensions of The Bristol Female Lower Urinary Tract Symptoms Scale and the Healthy Life Style Behavior Scale were found as .877, .930 respectively. These values showed that the scales were valid and reliable in the study group.

Statistical analysis

The data were evaluated and analyzed, the errors were checked, and tables were drawn on the computer using a statistical software program. In the data analysis, descriptive statistical methods (frequency, percentage, mean, standard deviation) were used. Mann-Whitney U test, One-Way ANOVA/Kruskal-Wallis tests were used for measurable data and then Turkey's HSD test / Mann-Whitney U test were performed to determine the differences between the groups in these tests. Pearson correlation analysis was used to determine the relationships between the scales. Cronbach's alpha coefficient was calculated. The mean scores were given with standard deviation (mean±ss) and $p<0.05$ was considered statistically significant.

RESULTS

The average age of the women aged 50 and over in in Gümüşhane was 64.55±11.197 (min=50, max=96). The findings regarding the socio-demographic characteristics of the women are given in Table 1.

Table 1. Sociodemographic characteristics

Variable	*n*	*%*
Age		
50-64 old age adults	293	54.0
65-74 young old	126	23.2
75-84 middle old	89	16.4
85 or over – oldest old	35	6.4
Occupation status		
Housewife	482	88.8
Retired	42	7.7
Employed	19	3.5
Education level		
Illiterate	184	33.9
Literate	69	12.7
Primary school	227	41.8
Secondary school	26	4.8
High school and its equivalent	24	4.4
Higher Education /faculty	13	2.4
Marital status		
Married	343	63.2
Single	200	36.8

The average Body Mass Index (BMI) of the participants was 29.25±5.31 kg/m2 (min=15.60 kg/m2 max=46.86 kg/m2).

The average number of pregnancies, births, miscarriages and abortions of the women was found as 6.01±2.94, 4.86±2.458, 1.77±1.169, and 1.73±1.068 respectively and the average birth weight of the infants was 3.31±0.66. It was found that 20.2% of the women had a gynecological surgeries, 17.3% had and 9.2% had had a psychological disorder previously; 65.9% had a chronic disease; 18.4% had a continuous use of a drug; 47.1% had a constipation problem; 23.8% did regular exercise; 51.3% did exercise more than three times a week; 8.5% smoked; 7.4% consumed more than two cups of coffee a day; 74.9% consumed more than two cups of tea a day. 19.3% stated that they used daily pads, 61.3% used water and toilet paper for vaginal cleansing and 40.5% took vaginal shower.

In this study, 14.0% (≤1 35.4%; ≥2 50.7%) reported such complaints as urinating at night (nocturia), urinary urgency (76.6%), dysuria (55.6%) and frequent urination (less than 4 hours) (47.0%). 39.4% indicated that they waited for the onset of urination,

25.6% strained to urinate and 38.9% wanted to urinate again after a cessation in urinary flow.

Table 2. Obstetric characteristics of the women.

Variable	*n*	%
The number of pregnancies (n=519)		
One-three	117	20.4
Four-six	221	42.6
Seven-nine	123	23.7
Ten and over	69	13.3
The number of miscarriages (n= 255)		
One	140	54.9
Two	69	27.1
Three	29	11.4
Four and over	17	6.6
The type of delivery (n= 523)		
Vaginal	475	90.8
Cesarean	16	3.1
Vaginal and cesarean	32	6.1
Episiotomy implementation during delivery (n= 454)		
Yes	100	22.0
No	354	78.0
The number of births (n= 510)		
One-two	73	14.3
Three	98	19.2
Four	92	18.2
Five	86	16.9
Six	48	9.4
Seven	42	8.2
Eight and over	71	13.9
The number of abortions n=105)		
One	62	59.0
Two	20	19.0
Three and over	23	22.0
The place of giving birth (n=521)		
In hospital	111	21.3
At home	251	48.2
In hospital and at home	159	30.5
*Giving birth to an infant over 4.000 gr (n= 483)		
Yes	128	26.5
No	355	73.5

In this study, 64.1% of women reported that they had UI complaints. 62.6% could not catch up the toilet and 62.1% leaked urine while sneezing, coughing and when physically active. 29.1% and 19.0% had urinary incontinence complaints without a cause and sensation, and during sleep respectively. In addition, 14.4% stated that urinary problems affected their sexual lives while 10.3% had urinary incontinence during sexual intercourse.

The symptoms on the quality of life were listed as follows: 59.1% changed their clothes during the day due to urinary incontinence; 38,1% reduced the amount of fluid taken daily to reduce urinary complaints; 43.8% stated that their urinary complaints affected their daily work (cleaning, furniture removal); 54.9% did not go to a place without a toilet nearby; and 57.8% reported that urinary complaints affected their lives. The average scores of scales obtained by women are given in Table 3.

The evaluation of BFLUTS scores revealed that as the age increased (χ=16.661, p=0.001) the symptoms also increased and the symptoms were found to be less among the women who were employed (χ2=7.170, p=0.028), married (χ2=8,970, p=0.011), who had high level of education (χ2=14.378, p=0.013), who gave birth in the hospital (χ2=10.738, p=0.005) and who did not have any gynecologic surgery (z=19266.000, p=0.017). The women who still have a psychological disorder (χ2=14.167, p=0.001), a chronic illness (z=25068.000, p=0.001), a constipation problem (z=29028.000, p=0.000) and use a daily pad (z=19240.000, p=0.009) were reported to experience more symptoms.

It was determined that the women with a low income had more incontinence symptoms (χ^2=6.893, p=0.032) those with episiotomies had more symptoms related to Sexual Life (z=14459.000, p=0.000) and those using any drugs had more storage (z=17434.000, p=0.023) and urinary symptoms (z=17595.500, p=0.025). Additionally, the Storage Symptoms (z=20872.000, p=0.012) and the symptoms related to Sexual Life (z=9531.500, p=0.004) were found to be higher among the women who never did exercises and smoked respectively.

In this study whether there was an association between BFLUTS scores and obstetric stories of the women was investigated. A low level significantly positive relationship was found between the Storage Symptoms and the number of pregnancies (r=0.128, p=0.003), births (r=0.103, p=0.020) and miscarriages (r=0.149, p=0.017). A low level significantly positive relationship was determined between the Incontinence Symptoms and the number of pregnancies (r=0.167, p=0.000), the number of births (r=0.141, p=0.001) and the number of abortions (r=0.132, p=0.035). A low level significantly positive relationship was reported between The Symptoms related to Quality of Life and the number of pregnancies (r=0.143, p=0.001) and the births (r=0.119, p=0.009). A low level significantly positive relationship was also found between BFLUTS scores and the number of pregnancies (r=0.152, p=0.001),

births (r=0.132, p=0.003) and abortions (r=0.140, p=0.026). As the number of pregnancies, births and abortion increased, the BFLUTS total scores also increased.

Table 3. The scores of Bristol Female Lower Urinary Tract Symptoms Scale and Healthy Life Style Behavior Scale (n=534)

BFLUTS	**mean ±SD**	**min**	**max**
Storage Symptoms	5.09±3.06	0	15
Urination Symptoms	1.71±2.07	0	12
Incontinence Symptoms	4.33±3.93	0	19
Symptoms related to Sexual Life	0.35±0.92	0	6
Symptoms related to Quality of Life	4.94±4.31	0	18
Total	16.43±11.06	0	50
HLBS			
Health Responsibility	22.07±5.33	6	36
Physical Activity	12.41±4.37	6	28
Nutrition	22.14±4.32	10	34
Spiritual Development	24.45±5.56	6	36
Interpersonal Relations	26.13±5.19	11	36
Stress Management	18.57±4.51	6	32
Total	125.76±22.743	66	188

Table 4. Relationship between Bristol Female Lower Urinary Tract Symptoms Scale and Healthy Life Style Behavior Scale scores in females

BFLUTS		**HLSBS Health Responsibility**	**HLSBS Physical Activity**	**HLSBS Nutrition**	**HLSBS Spiritual Development**	**HLSBS Interpersonal Relations**	**HLSBS Stress Management**	**HLSBS Total**
Storage Symptoms	*r*	.015	-.056	.012	-.080	-.029	-.031	-.036
	p	.722	.196	.789	.064	.496	.465	.405
Urination Symptoms	*r*	-.037	-.035	-.007	-.102	-.088	-.067	-.071
	p	.387	.412	.878	.018	.041	.120	.096
Incontinence Symptoms	*r*	.000	-.022	.001	-.113	-.045	-.069	-.053
	p	.996	.609	.977	.008	.293	.109	.216
Symptoms related to Sexual Life	*r*	-.002	-.025	-.058	-.021	-.031	-.055	-.033
	p	.965	.566	.177	.627	.466	.201	.440
Symptoms related to Quality of Life	*r*	.034	.015	-.015	-.051	.011	-.027	.000
	p	.432	.723	.730	.233	.801	.529	1.000
Total	*r*	.020	-.018	-.001	-.092	-.025	-.050	-.031
	p	.638	.677	.974	.033	.555	.246	.467

A low level meaningful correlation in the negative direction was found among HLSBS Spiritual Development and Symptoms of Urination, Incontinence Symptoms and the BFLUTS total scores. As the symptoms of BLUFTS increased in women, there was a decrease in the Spiritual Development.

DISCUSSION

The epidemiological studies conducted in recent years show that LUTS are common especially among women. UI, OAB and other LUTS deeply affect women's quality of life. In a society- based study investigating LUTS among adults (18 and older) conducted in five countries (Canada, Germany, Italy, Sweden and the United Kingdom), the overall prevalence of LUTS was reported as 67%. Besides, the prevalence of LUTS was found higher than many other chronic diseases[23,24]. In our study, LUTS storing symptom, urination once at night was found as 35.4% for nocturia and urination twice and more was 50.7%. One of The Storage symptoms, urinary urgency was found as 76.6%, dysuria was 55.6% and

the frequency of urination (less than 4 hours) was 47.0%.

In a study by Wang et al., the ratio of nocturia which is defined as waking up for urination twice or more times at night, storage symptoms and LUTS were found as 24.7%, 35.7% and 39.7% respectively. Three basic LUTS were indicated to increase with age. The urination and post-urination symptoms were found higher in men aged 40-49 than women and this difference became more significant as they got older[25].

The results of this study and those in the literature are parallel to each other and the ratio of the women reporting LUTS in our study was found higher. The studies in the literature also revealed that many factors such as the differences in the age groups (differences such as ≥19, ≥20 and ≥40 years old), race, ethnic origin and obstetric history were thought to be effective[26].

Among the symptoms of urination, the rate of the women reporting complaints about waiting for the onset urination was found to be 39.4%, those reporting urinary straining complaint was 25.6% and those wanting to urinate again after a cessation in urinary flow was 38.9%. In our study, the urination symptoms were found to be lower than the other symptoms. In a study by Irwin et al. (2006) which was in parallel with our study, the prevalence of urination symptoms were lower than the other LUTS[23].

In our study, incontinence symptoms rate in women 50 years and older was determined as 64.1%. This rate is similar to the work done in Turkey. In a study conducted with men and women over 18 years of age, the prevalence of LUTS among women was 64.1%[27]. In an epidemiological study, the prevalence of UI ranged from 25 to 45%. UI is two times more common in women than in men[28]. Studies conducted in various countries have reported that the incidence of UI in women varies between 9.4% and 54.8%[29-30].

In our study, the rate of symptoms affecting sexual life was 14.4% and the rate of incontinence during sexual intercourse was 10.3%. In a study conducted by Visser et al. with 350 women over 55 years old, 68% of the women were sexually active, 25% restricted sexual activity due to urinary incontinence, and 26% had urine leakage during sexual activity. In the study, it was emphasized that sexual life in women was affected by urinary complaints[31].

The total risk factors in BFLUTS were determined as employment status (less symptoms in employed people), old age, marital status (more symptoms in the divorced or widow), low income, low education level, an unemployed spouse, having given birth at home, having a previous gynecological surgery, constipation, smoking, a chronic disease history, using a daily pad and the increased number of pregnancies, births and miscarriages. In a study conducted with 216 post-menopausal women, urinary incontinence and risk factors were identified as old age, early menopause age, obesity, high parity, vaginal delivery, previous hysterectomy. Besides, old age, smoking, high parity and not using hormone therapy are also indicated as significant risk factors[13,27,32, 33].

In our study, a significant difference was found between the status of regular exercise and Storage Symptoms. Storage Symptoms are less common among women exercising regularly. The rate of SUI was lower in middle-aged women who performed regular and low intensity exercise[34]. It has been reported that moderate daily exercise per week reduces the risk of developing UI by 20-25% in older women. It has been emphasized that SUI can be prevented, especially as a result of strengthening the pelvic floor muscles[29].

In our study, a statistically significant correlation was not determined between the total scores of BFLUTS and HLBS. A low level significantly negative relationship was found between The Spiritual Development sub-dimension and The Urine Symptoms, Incontinence symptoms and total BFLUTS scores. In the related studies, smoking cessation and doing regular exercise are reported to reduce LUTS. Lifestyle behavior has an important place in the etiology of LUTS[35].

It is important to define the risk factors in order to choose an appropriate therapy for the individuals with LUTS. Since prevention treatment is cheaper, it is more appropriate to use it in the primary care practice. Determining risk factors for LUTS and its prevalence and choosing the appropriate therapies and taking preventive measures for the future are very crucial. Increasing the awareness of society regarding an early diagnosis and treatment is also important.

In the management of LUTS; weight loss, smoking cessation, diet, reduction of bladder irritants, fluid intake management, physical exercise, bladder training, prevent constipation, such as indirect or

directly effective lifestyle changes are recommended. Prior to a medical treatment, the women with lower urinary tract complaints should be analyzed by evaluating their lifestyle in order to reduce the complaints.

Yazar Katkıları: Çalışma konsepti/Tasarımı: HÖ, NKB; Veri toplama: HÖ; Veri analizi ve yorumlama: HÖ; Yazı taslağı: HÖ; İçeriğin eleştirel incelenmesi: HÖ, NKB; Son onay ve sorumluluk: HÖ, NKB; Teknik ve malzeme desteği: HÖ, NKB; Süpervizyon: HÖ, NKB; Fon sağlama (mevcut ise): yok.
Bilgilendirilmiş Onam: Katılımcılardan yazılı onam alınmıştır.
Hakem Değerlendirmesi: Dış bağımsız.
Çıkar Çatışması: Yazarlar çıkar çatışması beyan etmemişlerdir.
Finansal Destek: Yazarlar finansal destek beyan etmemişlerdir.

Author Contributions: Concept/Design : HÖ, NKB; Data acquisition: HÖ; Data analysis and interpretation: HÖ; Drafting manuscript: HÖ, NKB; Critical revision of manuscript: HÖ, NKB; HÖ, NKB; Final approval and accountability: HÖ, NKB; Technical or material support: HÖ, NKB; Supervision: HÖ, NKB; Securing funding (if available): n/a.
Informed Consent: Written consent was obtained from the participants.
Peer-review: Externally peer-reviewed.
Conflict of Interest: Authors declared no conflict of interest.
Financial Disclosure: This study was supported by TUBİTAK 1002 fast support program. [Project Number 115S900].

REFERENCES

1. Haylen BT, de Ridder D, Freeman RM, Swift SE, Berghman B, Lee J et al. An international Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. Neurourol Urodyn. 2010;29:4-20.
2. Maserejian NN, Chen S, Chiu GR, Wager CG, Kupelian V, Araujo AB et al. Incidence of lower urinary tract symptoms in a population-based study of men and women. Urology. 2013;82:560-4.
3. Bradway C, Coyne KS, Irwin D, Kopp Z. Lower urinary tract symptoms in women-a common but neglected problem. J Am Assoc Nurse Pract. 2008;20:311-8.
4. Milsom I. Lower urinary tract symptoms in women. Curr Opin Urol. 2009;19:337-41.
5. Correia S, Dinis P, Rolo F, Lunet N. Prevalence, treatment and known risk factors of urinary incontinence and overactive bladder in the non-institutionalized Portuguese population. Int Urogynecol J Pelvic Floor Dysfunct. 2009;20:1481-9.
6. Wennberg AL, Molander U, Fall M, Edlund C, Peeker R, Milsom I. Lower urinary tract symptoms: Lack of change in prevalence and help-seeking behavior in two population-based surveys of women in 1991 and 2007. BJU Int. 2009;104:954-9.
7. Moreira ED, Neves RC, Neto AF, Duarte FG, Moreira TL, Lobo CF et al. A population-based survey of lower urinary tract symptoms (LUTS) and symptom-specific bother: results from the Brazilian LUTS epidemiology study (BLUES). World J Urol. 2013;31:1451-8.
8. Timur S, Beji NK, Aslan E, Yalçın Ö. Determining lower urinary tract symptoms and associated risk factors in young women. Int J Gynaecol Obstet. 2012;118:27-30.
9. Choo SM, Han JH, Shin TY. Alcohol, smoking, physical activity, protein, and lower urinary tract symptoms: prospective longitudinal cohort. Int Neurourol J. 2015;19:197-206.
10. Richter HE, Whitehead N, Arya L, Ridgeway B, Allen-Brady K, Norton P et al. Genetic contributions to urgency urinary incontinence in women. J Urol. 2015;193:2020-7.
11. Ünsal A, Tözün M, Arslantaş D. Urinary incontinence, depression and associated factors in the women aged 20 and over living in Beylikova district, Eskişehir. TAF Prev Med Bull. 2013;12:231-44.
12. Christofi N, Hextall A. An evidence-based approach to lifestyle interventions in urogynaecology. Menopause Int. 2007;13:54-8.
13. Lucas MG, Bedretdinova D, Berghmans LC, Burkhard F, Cruz F, Nambiar AK et al. Guidelines on urinary incontinence. European Association of Urology. 2015.
14. Karan A. Physical therapy and rehabilitation in urogynecology. Lifestyle Changes in Pelvic Floor Dysfunction. Istanbul, 49-62. Nobel Medicine Bookstore, 2016.
15. Milne JL. Behavioral therapies for overactive bladder making sense of the evidence. J Wound Ostomy Continence Nurs. 2008;35:93-101.
16. Wyman JF, Burgio KL, Newman DK. Practical aspects of lifestyle modifications and behavioral interventions in the treatment of overactive bladder and urgency urinary incontinence. Int J Clin Pract. 2009;63:1177-91.
17. Gungor I, Kızılkaya BN. Lifestyle changes for the prevention and management of lower urinary tract symptoms in women. Int J Urol Nurs. 2011;5:3-13.
18. Jackson S, Donovan J, Brookes S, Eckford S, Swithinbank L, Abrams P. The bristol female lower urinary tract symptom questionnaire: development and psychometric testing. Br J Urol. 1996;77:805-12.
19. Güngör F. Stres üriner inkontinans olgularında tension-free vaginal tape ve tension –free vaginal tape – obturator operasyonlarının klinik ve ürodinamik sonuçlarının karşılaştırılması. (Uzmanlık Tezi). İstanbul, İstanbul Üniversitesi, 2005.
20. Gökkaya SC, Öztekin ÇV, Doluoğlu ÖG, Güzel Ö, Erşahin V, Özden C et al. Bristol kadın alt üriner sistem semptom indeksinin Türkçe versiyonunun geçerliliğinin değerlendirilmesi. Clin Anal Med. 2012;3:415-8.
21. Walker SN, Sechrist KR, Pender NJ. The health-promoting lifestyle profile: Development and psychometric characteristics. Nurs Res. 1987;36:76-81.
22. Bahar Z, Beşer A, Gördes N, Ersin F, Kıssal A. Sağlıklı yaşam biçimi davranışları-2'nin geçerlik ve

güvenilirlik çalışması. Cumhuriyet Üniversitesi Hemşirelik Yüksekokulu Dergisi. 2008;12:1-13.
23. Irwin DE, Milsom I, Hunskaar S, Reilly K, Koop Z, Herschorn S et al. Population-based survey of urinary incontinence, overactive bladder, and other lower urinary tract symptoms in five countries: results of the EPIC study. Eur Urol. 2006;50:1306-15.
24. Beji NK, Ozbas A, Aslan E, Bilgiç D, Erkan HA. Overview of the social impact of urinary incontinence with a focus on Turkish women. Urol Nurs. 2010;30:327-34.
25. Wang Y, Hu H, Xu K, Wang X, Na Y, Kang X. Prevalence, risk factors and the bother of lower urinary tract symptoms in China: A population based survey. Int Urogynecol J. 2015;26:911-9.
26. Gravas S, Kyriazis I, Klausner AP. Lower urinary tract symptoms ıncluding bladder outlet obstruction: What's new in diagnostics? Eur Urol Focus. 2018;4:482-3.
27. Zumrutbas AE, Bozkurt AI, Tas E, Acar CI, Alkıs O, Coban K et al. Prevalence of lower urinary tract symptoms, overactive bladder and urinary incontinence in western Turkey: results of a population-based survey. Int J Urol. 2014;21:1027-33.
28. Buckley BS, Lapitan MC. Prevalence of urinary incontinence in men, women, and children current evidence: findings of the Fourth International Consultation on Incontinence. Urology, 2010;76:265-70.
29. Danforth KN, Shah AD, Townsend MK, Lifford KL, Curhan GC, Resnick NM et al. Physical activity and urinary ıncontinence among healthy, older women. Obstet Gynecol. 2007;109:721-7.
30. Zhu L, Li L, Lang J, Xu T, Wong F. Epidemiology of mixed urinary incontinence in China. Int J Gynaecol Obstet. 2010;109:55-8.
31. Visser E, de Bock GH, Berger MY, Dekker JH. Impact of urin urinary incontinence on sexual functioning in community-dwelling older women. J Sex Med. 2014;11:1757-65.
32. Şentürk Ş, Kara M. The prevalence of urinary incontinence in menopausal women and risk factors. Van Medical Jorunal. 2010;17:7-11.
33. Bakarman MA, Al-Ghamdi SS. The effect of urinary ıncontinence on quality of life of women at childbearing age in Jeddah, Saudi Arabia. Glob J Health Sci. 2016;8:281-8.
34. Devore EE, Minassian VA, Grodstein F. Factors associated with persistent urinary incontinence. Am J Obstet Gynecol. 2013;209:145-6.
35. Maserejian NN, Kupelian V, Miyasato G, McVary KT, McKinlay JB. Are physical activity, smoking and alcohol consumption associated with lower urinary tract symptoms in men or women? Results from a population based observational study. J Urol. 2012;188:490-5.