Effects of Genital Hygiene Behaviors of Midwifery and Nursing Students on Vaginal and Urinary Tract Infections

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Abstract

Aim: The study was carried out to determine midwifery and nursing students' genital hygiene behaviors and effects of these behaviors on vaginal and urinary tract infections.

Method: This descriptive and cross-sectional study was conducted with 282 female students studying in the midwifery and nursing departments of Kırklareli University Health School between March 1, 2021, and April 31, 2021. The data were collected using the Genital Hygiene Behaviors Scale and the questionnaire prepared by the researchers which questions the socio-demographic and infection-related characteristics of the participating students. Numbers, percentage distribution, chi-square analysis, Mann Whitney U test and Kruskall Wallis test were used in the analysis of the data, and post-hoc Bonferroni test was used in further analysis.

Results: The mean age of the students was 21.62±1.90 years. Of them, 49.3% were midwifery students and 50.7% were nursing students. The mean score the students obtained from the overall Genital Hygiene Behaviors Scale was 93.07±12.07. The mean scores they obtained from its sub-dimensions were as follows: 48.15±6.57 from the General Hygiene sub-dimension, 33.83±4.8 from the Menstrual Hygiene sub-dimension, 11.08±2.88 from the Abnormal Finding Awareness sub-dimension. It was also determined that the students displayed better genital hygiene behaviors as their year at school increased. The analysis (comparison) of the mean scores the participants obtained from the Genital Hygiene Behaviors Scale and its sub-dimensions in terms of the variables such as the place of residence stayed longest, economic status, daily

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pad use, bathing position, being diagnosed of urinary tract infection in the last year demonstrated that there were significant differences between the participants' scores ($p<0.05$).

Conclusions: It was determined that the genital hygiene behaviors of the midwifery and nursing students participating in the study were at a good level, that the higher their year at school was the more positive their genital hygiene behaviors were and that the students who were diagnosed with urinary tract infections in the last year obtained lower mean scores from the Genital Hygiene Behaviors Scale. Within this context, it is recommended that midwifery and nursing students should be given training on genital hygiene in the first year of their education.

Keywords: Genital hygiene, urinary tract infection, vaginal infection, midwifery, nursing students.

Ebelik ve Hemşirelik Öğrencilerinin Genital Hijyen Davranışlarının Vajinal ve İdrar Yolu Enfeksiyonları Üzerine Etkisi

Öz

Amaç: Araştırma, ebelik ve hemşirelik öğrencilerinin genital hijyen davranışlarının ve bu davranışların vajinal ve idrar yolu enfeksiyonları üzerine olan etkisinin belirlenmesi amacıyla yapılmıştır.

Yöntem: Tanımlayıcı ve kesitsel tipte olan bu çalışma, 1 Mart - 31 Nisan 2021 tarihleri arasında, Kırklareli Üniversitesi Sağlık Yüksekokulu ebelik ve hemşirelik bölümlerinde okuyan 282 kız öğrenci arasında yürütülmüştür. Veriler, araştırmacılar tarafından hazırlanan, sosyo-demografik ve enfeksiyon bilgilerini içeren anket formu ve Genital Hijyen Davranışları Ölçeği kullanılarak google anket formlar aracılığıyla toplanmıştır. Verilerin değerlendirilmesinde sayı yüzde dağılımı, ki-kare analizi, Mann Whitney U testi, Kruskall Wallis testi, ileri analizde ise post-hoc bonferonni testi kullanılmıştır.

Bulgular: Araştırmaya katılan öğrencilerin %49,3'ü ebelik, %50,7'si hemşirelik öğrencisidir. Öğrencilerinin yaş ortalaması 21.62±1.90'dir. Öğrencilerin Genital Hijyen davranışları ölçeğinden aldıkları toplam puan ortalaması 93.07±12.07'dır. Bu ölçeğin alt boyutlarından olan genel hijyen alışkanlıkları alt boyut puan ortalaması 48.15±6.57, adet hijyeni alışkanlıkları alt boyut puan ortalaması 33.83±4.8, anormal bulgu farkındalığı alt boyut puan ortalaması 11.08±2.88'dir. Öğrencilerin öğrenim gördüğü sınıf seviyeleri artıkça genital hijyen davranışlarının da arttığı saptanmıştır. Yaşamın önemli bir bölümünü geçirdiği yer, ekonomik durum, günlük ped kullanım durumu, banyo yapma pozisyonu, son bir yıl içinde idrar yolları enfeksiyonu tanısı alma ile genital hijyen davlarınışları toplam ve altboyut puan ortalamalarında istatistiksel anlamda fark bulunmuştur ($p<0.05$).

Sonuç: Çalışmaya katılan ebelik ve hemşirelik öğrencilerinin genital hijyen davranışlarının iyi düzeyde olduğu ve sınıf seviyesi arttıkça genital hijyen davranışlarının olumlu yönde etkilendiği ve son bir yıl içinde idrar yolları enfeksiyonu tanısı alan öğrencilerin genital hijyen davranışları ölçek puan ortalamasının daha düşük olduğu belirlenmiştir. Bu bağlamda ebelik ve hemşirelik öğrencilerine öğrenim hayatlarının ilk yılında genital hijyen eğitimlerinin verilmesi önerilebilir.

Anahtar Kelimeler: Genital hijyen, idrar yolu enfeksiyonu, vajinal enfeksiyon, ebelik, hemşirelik öğrencileri.

Introduction

Among the factors causing women to seek medical help in gynecology outpatient clinics, the leading ones are vaginal infections (VI) and urinary tract infections (UTI). Vaginal infections occur due to the deterioration of the vaginal flora or due to sexually transmitted microorganisms[1]. Urinary tract infections are defined as bacterial infections occurring in any part of the urinary system[2]. Factors such as the anatomical proximity of the urethra, vagina and anus in women, medications taken (antibiotics, hormonal contraceptives) and inadequate genital hygiene cause UTIs to occur 3 times more often in women than in men[3,4]. It has been reported that 75% of women worldwide have a history of VI or UTI[5]. While the prevalence of UTIs in women in the world ranges between 50% and 60%, the prevalence of VIs and UTIs in Turkey varies between 37% and 65%[6-8]. In a study conducted with university students in India and Saudi Arabia, the prevalence of UTIs was determined as 19.8% and 32.1%, respectively[9,10]. In studies conducted with university students in Turkey, 36% of the participants had a history of VI or UTI[6,8,11].

In the literature, the frequency of vaginal infections is stated to be related with genital hygiene behaviors[12-14]. Genital hygiene behaviors are practices for the cleaning of genital organs[15]. Among the genital hygiene behaviors are the cleaning of the external genitalia (genital organs) from front to back, cutting (trimming / shaving) of (removing) pubic hair, using sanitary pads, piercing, tattooing, and wearing appropriate underwear. In a descriptive study conducted with students studying in the health department, 68.2% to 86% of the participants cleaned their genital area from front to back to ensure genital hygiene. The fact that these students performed genital hygiene practices correctly was associated with the fact that they had adequate knowledge about this issue within the scope of the courses they took on "perineum care" during their university education. In the literature, it is stated that the material underwear is made up of, and cleaning and replacement frequency of underwear are associated with VI and UTI (there is association between VI and UTI and the material underwear is made up of, and cleaning and replacement frequency of underwear)[5,16]. Synthetic underwear does not absorb moisture as cotton underwear does and causes the environment to remain constantly moist, which poses a risk for VI and UTI.In a study, the frequency of VI and UTI was higher in the participants wearing satin underwear[5]. In their descriptive study (2015), Topuz et al. stated that most of the participants changed their underwear rather rarely, once a week[14]. Moist and wet vaginal environment during menstruation is also an important risk factor that leads to infection. Since menstrual blood, which has alkaline properties, increases the risk of infection, attention should be paid to perineal hygiene, and a shower should be taken during this period. In several studies, according to their statements, the rate of the participants who did not take a bath during menstruation varied between 3.8% and 36.4%[14,16].

As soap disrupts the acidic structure of the vaginal environment, using soap for vaginal douching, and cleaning of the external genitalia pave the way for the development of vaginal and urinary tract infections[12-14]. The review of domestic and international studies conducted to investigate the genital hygiene behaviors of women revealed that the rate of cleaning the genital area with only water varied between 4.5% and 63.2%[6,13,17-19]. In a descriptive study conducted with female students studying in health departments (health management, child development, nursing, physiotherapy and rehabilitation), the rate of using water and soap to ensure genital hygiene among them varied between 6.2% and 27.1%[11,14].

Another factor affecting the development of vaginal and urinary tract infections is the person's genital hygiene practice-related knowledge level, and socio-economic level which affects his or her access to products such as hygienic pads[20]. In the literature, it is stated that the increase in education and socio-economic levels improves genital hygiene behaviors and accordingly decreases the rates of VI and UTI[16]. In a study, women with high school or higher education displayed better genital hygiene behaviors, and VI and UTI were more common in women whose education levels were low[16,20].

To prevent VI and UTI from developing, genital hygiene behaviors of young women should be determined and the relationship between these behaviors, and vaginal and urinary tract infections should be revealed. Our review of the pertinent literature revealed that several studies were conducted on the determination of genital hygiene behaviors[21-23]. But that there was a gap in the literature regarding studies conducted to investigate the effects of genital hygiene behaviors on the development of vaginal and urinary tract infections. This descriptive cross-sectional and online type study was aimed at determining the genital hygiene behaviors of midwifery and nursing students, and the effects of these behaviors on vaginal and urinary tract infections.

Research Questions:

What are the genital hygiene behaviors of midwifery and nursing students like?

What are the factors affecting genital hygiene behaviors of midwifery and nursing students?

Do genital hygiene behaviors of midwifery and nursing students affect urinary tract and vaginal infections?

Material and Methods

Design and Setting

This cross-sectional online survey was conducted with female students studying in the midwifery and nursing departments of Kırklareli University Health High School between March 1, 2021 and April 31, 2021.

Recruitment and Data Collection

The population of the study consisted of female students studying in the midwifery and nursing department of Kırklareli University in the 2020-2021 academic year. Of the students with even ID numbers, those selected by using the simple random sampling method were contacted online (via WhatsApp) and invited to participate in the study. The invitation included an information sheet explaining the study, assuring students that participation was voluntary and anonymous, and included a link to a consent sheet and the online survey. Access to the questionnaires prepared via google form was open from March 1, 2021 to April 31, 2021. During the data collection process, three reminders were sent to the participants.

Sample Size

The number of female students studying in midwifery and nursing departments was 668. The raosoft sample size calculation program was used to calculate the sample size of the study (http://www.raosoft.com/samplesize.html). Using the sample size formula of known population, it was determined that a minimum of 245 students should be reached in the study (α=0.05, 1-β=0.95). "However, considering the possibility of losses during the study, it was decided to include a larger number of students. Thus the study sample included 282 students."

The Inclusion Criteria*:* Volunteering to participate in the study, being able to access the Internet and answering the questionnaire completely.

The Exclusion Criteria: Having a problem preventing from communication.

Survey Instruments

The study data were collected by using the "Participant Information Form" and Genital Hygiene Behaviors Scale (GHBS).

***Participant Information Form*:** The form was developed by the researchers in line with the pertinent literature. The form includes 27 items. While 12 of the items question the sociodemographic characteristics of the participants, the remaining 15 items question their genital hygiene behaviors, factors that may cause urinary tract infections, and the current vaginal infection findings[21, 24, 25].

***Genital Hygiene Behaviors Scale*:** Karahan who developed the scale in 2017 also performed its validity and reliability study. The scale has 23 items and the following 3 sub-dimensions: "General Hygiene Behaviors" (12 items), "Menstrual Hygiene" (8 items) and "Abnormal Finding Awareness (3 items). The responses given to the items are rated on a 5-point Likert-type scale ranging from 1 to 5. The minimum and maximum possible mean scores to be obtained from the scale are 23 and 115 respectively. The scale is used to measure women's genital hygiene behaviors.

The higher the score obtained from the scale is, the better the person's genital hygiene behaviors are. The alpha values for the sub-dimensions of the scale in Karahan's study were as follows: 0.70 for the General Hygiene sub-dimension, 0.74 for the Menstrual Hygiene sub-dimension, and 0.81 for the Abnormal Finding Awareness sub-dimension. Written permission was obtained from Karahan to administer the scale in the present study[26]. In the present study, the alpha value was 0.84 for the overall scale, 0.74 for the General Hygiene sub-dimension, 0.70 for the Menstrual Hygiene sub-dimension, and 0.68 for the Abnormal Finding Awareness sub-dimension.

Ethical Consideration

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Data Analysis

For data analysis, the IBM SPSS V23 (SPSS, Inc.,Chicago, IL, USA) was used. The Kolmogorov Smirnov test was used to find out whether the data were distributed normally. Descriptive statistics and Chi-square were used to compare the categorical data. The comparison of the data having normal distribution according to the study groups was performed using the Mann Whitney u test whereas the comparison of the data without normal distribution according to the groups was performed using the Kruskall Wallis test. Post-hoc Bonferroni test was used for further analysis. The results of the analyses were presented as mean ± SD and median (minimum - maximum) for the quantitative data, and as frequency and percentage for the categorical data. A p value of <0.05 was considered statistically significant.

Results

The mean ages of the midwifery (n: 143) and nursing (n: 139) students were 21.62±1.90 and 21.69±1.88 respectively. The comparison of the midwifery and nursing students in terms of their socio-demographic characteristics such as weight, height, family type, economic status, smoking and alcohol use demonstrated that there was no statistically significant difference between the groups (p=0.869, p=0.202, p). =0.611, p=0.847, p=0.359, p=0.673, p=0.132, Table 1). The place of residence stayed longest was a metropolis for 49.7% of the midwifery students and 57.6% of the nursing students. There was a statistically significant difference between the groups in terms of this variable (p=0.031, Table 1).

Table 1. Comparison of the Sociodemographic and Descriptive Characteristics of Midwifery and Nursing Students

Variables	Midwifery Students (n:143)		Nursing Students (n:139)		Total (n:282)		Test/p
	Mean±SD		Mean±SD		Mean±SD		
Age	21.62±1.90		21.69±1.88		21.65±1.89		Z:-0.165 p:0.869
Weight (kg)	60.43±9.74		59.19±9.21		59.81±9.47		Z:-1.276 p:0.202
Height (cm)	163.96±6.05		164.32±5.64		164.12±5.84		Z:-0.508 p:0.611
	n	%	n	%	n	%	
Place of residence stayed longest							
Rural area - village	16	1.2	24	17.3	40	14.1	x^2:6.927 p=0.031
District - town	56	9.2	35	25.2	91	32.2	
Metropolis - city	71	9.7	80	57.6	151	3.5	
Family type							
Extended Family	0	1.0	29	20.9	59	20.9	x^2 :0.331 p:0.847
Nuclear family	06	4.1	101	72.7	207	73.4	
Fragmented family	7	.9	9	6.5	16	5.6	
Economic status							
Middle	7	67.8	5	61.2	182	4.5	x^2 : 2.048 p:0.359
Low	7	8.9	6	25.9	63	2.3	
High	9	3.3	8	12.9	37	3.1	
Smoking							
Yes	4	6.8	26	18.7	50	17.8	x^2:0.178 p:0.673
No	19	3.2	13	81.3	232	2.2	
Alcohol use							
Yes	21	14.7	30	21.6	51	8	x^2 : 2.264 p:0.132
No	22	5.3	09	78.4	231	2	

**Kruskal Wallis Test, x^2: Chi Square, Z: Mann Whitney U Test*

Of the students who participated in the study, 70.2% cleaned their genital area with water and toilet paper after they urinated, 63.4% did not use daily pads, 72.7% took a shower in the standing position, and 36.9% shaved the genital area (the pubic hair) with a razor blade. The groups were similar in terms of these characteristics (p=0.076, p=0.295, p=0.256, p=0.265) (Table 2).

Table 2. Comparison of Genital Hygiene Behaviors of Midwifery and Nursing Students

Variables	Midwifery Students (n:143)		Nursing Students (n:139)		Total (n:282)		Test / p
	n	%	n	%	n	%	
Material used for the cleaning of the genital area							
Wet wipes / toilet paper	2	.4	7	.0	9	.2	x^2=6.864 p=0.076
Only water	13	9.1	12	8.6	25	8.8	
Water and soap	32	22.4	18	12.9	50	17.8	
Water and toilet paper	96	67.1	102	73.4	198	70.2	
Daily pad usage							
Yes	48	33.6	55	39.6	103	36.6	x^2=1.095 p=0.295
No	95	66.4	84	60.4	179	63.4	
Bathing position							

Standing	109	76.2	96	69.1	205	72.7	x^2=2.726 p=0.256
Sitting	7	4.9	13	9.4	20	7.1	
Both	27	18.9	30	21.6	57	20.2	
Method used to clean the genital area							
Waxing	38	26.6	34	24.5	72	25.6	x^2=5.339 p=0.265
Razor blade	52	36.4	52	37.4	104	36.9	
Epilator	15	10.5	12	8.6	27	9.5	
Hair removal creams	6	4.2	15	10.8	21	7.4	
Plucking the pubic hair with gloved fingers	13	9.1	1	7.9	24	8.5	
Trimming	-	-	2	1.4	2	0.8	
Laser epilation (hair removal) etc.	19	13.3	13	9.4	32	11.3	

x^2: Chi Square

Of the students participating in the study, 88.7% did not have a urinary tract infection diagnosis (were not diagnosed with a urinary tract infection) in the last 1 year, 60.6% did not have a genital infection, 82.3% had vaginal discharge, 67.4% reported that the amount of vaginal discharge was not much, 56.0% defined the color of discharge as clear-transparent, 56.3% stated that vaginal discharge was odorless and 55% did not urinate until they felt fullness in the bladder. The groups were homogenous in terms of these characteristics (p=0.645, p=0.111, p=0.500, p=0.356, p=0.712, p=0.455, p=0.527, Table 3).

Table 3. Comparison of the Midwifery and Nursing Students in terms of Genital Infection Findings

Variables	**Midwifery Students**		**Nursing Students**		**Total**		**Test/p**
	n	**%**	**n**	**%**	**n**	**%**	
Having been diagnosed of urinary tract infection in the last year							
Yes	15	10.5	17	12.2	32	11.3	x^2=0.212 p=0.645
No	128	89.5	22	87.8	50	8.7	
Types of previous infections							
Urinary tract infection	48	33.6	8	27.3	86	30.5	x^2=4.400 p=0.111
Fungal infection-genital herpes-vaginitis	8	5.6	17	12.2	25	8.9	
None of the above	87	60.8	84	60.4	171	60.6	
Being aware of the presence of vaginal discharge							
Does not know	10	7.0	7	5.0	17	6	x^2=1.386 p=0.500
Yes	119	83.2	113	81.3	232	82.3	
No	14	9.8	19	13.7	33	11.7	
Amount of vaginal discharge							
Does not know	26	18.2	32	23.0	58	20.6	x^2=2.067 p=0.356
A little	102	71.3	88	63.3	190	67.4	
A lot	15	10.5	19	13.7	34	12	
Color of vaginal discharge							
Does not know	20	14.0	19	13.7	39	13.9	x^2=1.374 p=0.712
Clear-transparent	83	58.0	75	54.0	158	56	
White	30	21.0	30	21.6	60	21.2	
Greenish-yellow-grayish	10	7.0	15	10.8	25	8.9	
Odor of vaginal discharge							
Does not know	40	28.0	41	29.5	81	28.8	x^2=1.574 p=0.455
Odorless	85	59.4	74	53.2	159	56.3	
Malodorous	18	12.6	24	17.3	42	14.9	
Time to urinate							

When fullness is felt in the bladder	74	51.7	81	58.3	155	55	x^2=1.280 p=0.527
When the fullness of the bladder increases	56	39.2	46	33.1	102	36.1	
Waiting until having the urge to urinate	13	9.1	12	8.6	25	8.9	

x^2: Chi Square

According to the analysis, the mean scores the Midwifery and Nursing Students obtained from the overall Genital Hygiene Behaviors Scale and its sub-dimensions were as follows: the overall scale: 93.07±12.07, General Hygiene Behaviors sub-dimension 48.15±6.57, Menstrual Hygiene Behaviors sub-dimension: 33.83±4.8, Abnormal Finding Awareness sub-dimension: 11.08±2.88. There were no statistically significant differences between the groups (p>0.05, Table 4).

Table 4. Comparison of the mean scores the Midwifery and Nursing Students obtained from the overall Genital Hygiene Behaviors Scale and its sub-dimensions

Genital Hygiene Behaviors Scale sub-dimensions	Midwifery Students (n:143)	Nursing Students (n:139)	Total (n:282)	p
General Hygiene Behaviors sub-dimension	48.67±6.36	47.62±6.76	48.15±6.57	p*: 0.100
Menstrual Hygiene Behaviors sub-dimension	34.41±4.53	33.23±5.00	33.83±4.80	p*: 0.073
Abnormal Finding Awareness sub-dimension	11.11±2.91	11.05±2.87	11.08±2.88	p*: 0.805
Genital Hygiene Behaviors Scale	94.19±11.47	91.91±12.59	93.07±12.07	p*: 0.122

* *Kruskal Wallis Test*

Analysis of the factors affecting the mean scores obtained from the overall Genital Hygiene Behaviors Scale (GHBS) and its sub-dimensions demonstrated that as the students' year at school increased, so did the mean scores they obtained from the overall GHBS and its sub-dimensions. There was a statistically significant difference between the students in terms of their year at school (p<0.05) (Table 5). According to the further analysis performed with Bonferroni correction to determine from which students the difference stemmed, there was a statistically significant difference between the 1st and 3rd grade, 1st and 4th grade, and 2nd and 4th grade students in terms of their scores for the overall scale (p=0.039, p=0.000, p=0.006 respectively), and between the 1st and 4th grade, and the 2nd and 4th grade students in terms of their scores for the general hygiene sub-dimension (p=0.01, p=0.013 respectively). As for the mean scores for the Menstrual Hygiene sub-dimension, there was a statistically significant difference between the 1st and 4th grade students (p=0.000). As for the mean scores for the Abnormal Finding Awareness sub-dimension, there was a statistically significant difference between the 1st and 3rd, and between the 1st and 4th grade students (p=0.006, p=0.000 respectively (Table 5).

While no statistically significant difference was determined between the mean scores the participants obtained from the Genital Hygiene Behaviors sub-dimension in terms of the variable

“the place of residence stayed longest” (p>0.05), there was a statistically significant difference between the mean scores the participants obtained from the Menstrual Hygiene Behaviors and Abnormal Finding Awareness sub-dimensions and from the overall scale (p>0.05). According to the further analysis performed with Bonferroni correction to determine from which students the difference stemmed, there was a statistically significant difference between the students whose longest place of residence was 'Rural area / village and District / town', and 'Rural area / village and Metropolis / city’ in terms of their scores for the overall scale (p=0.013, p=0.006 respectively). As for the mean scores for the Menstrual Hygiene sub-dimension, there was a statistically significant difference between the students whose longest place of residence was 'Rural area / village and District / town', and 'Rural area / village and Metropolis / city’ (p=0.005, p=0.009 respectively).As for the mean scores for the Abnormal Finding Awareness sub-dimension, there was a statistically significant difference between the students whose longest place of residence was 'Rural area / village and District / town', and 'Rural area / village and Metropolis / city’ (p=0.019, p=0.002 respectively (Table 5).

The analysis of the effects of the students' economic status on the mean scores for the overall scale and its sub-dimensions demonstrated that there was a statistically significant difference between them in terms of their mean scores for the Menstrual Hygiene Behaviors sub-dimension (p=0.020). According to the further analysis performed to determine from which students the difference stemmed, there was a statistically significant difference between the students whose 'income was less than their expenses” and the students whose “income was equal to their expenses” in terms of the mean scores they obtained from the Menstrual Hygiene Behaviors sub-dimension (p=0.029) (Table 5). The analysis of the effects of the students' daily pad use on the mean scores for the overall scale and its sub-dimensions demonstrated that the students who stated that they used daily pads obtained higher mean scores from the overall scale and the Menstrual Hygiene Behaviors sub-dimension (p=0.003, p=0.002, Table 5).

The analysis of the effects of the students' having been diagnosed with urinary tract infection in the last year on the mean scores for the overall scale and its sub-dimensions demonstrated that the students who stated that they were not diagnosed with urinary tract infection in the last year obtained higher mean scores from the Menstrual Hygiene Behaviors sub-dimension (p=0.025) (Table 5).

It was determined that the students' bathing positions had a statistically significant effect on the mean scores they obtained from the overall scale and its “General Hygiene Behaviors”, “Menstrual Hygiene” and “Abnormal Finding Awareness” sub-dimensions (p=0.001, p=0.009, p=0.002, p=0.001 respectively).

According to the further analysis performed to determine from which students the difference stemmed, the difference stemmed from the students who took a bath by sitting and those who took a bath by both sitting and standing, and the students who took a bath by sitting and those who took a bath by standing in terms of the mean scores they obtained from the overall scale (p=0.028, p=0.001 respectively), from the students who took a bath by sitting and those who took a bath by standing in terms of the mean scores they obtained from the General Hygiene Behaviors sub-dimension (p=0.028), from the students who took a bath by sitting and those who took a bath by both sitting and standing and the students who took a bath by sitting and those who took a bath by standing in terms of the mean scores they obtained from the Menstrual Hygiene sub-dimension (p=0.022, p=0.004 respectively), and from the students who took a bath by sitting and those who took a bath by standing in terms of the mean scores they obtained from the Abnormal Finding Awareness sub-dimension (p=0.004).

Table 5. Analysis of the Factors Affecting the Mean Scores obtained from the Genital Hygiene Behaviors Scale and its Sub-dimensions

Variables	**General Hygiene Behaviors sub-dimension score**		**Menstrual Hygiene sub-dimension score**		**Abnormal Finding Awareness sub-dimension score**		**Genital Hygiene Behaviors Scale score**	
	Mean±SD	**Test*/p**	**Mean±SD**	**Test*/p**	**Mean±SD**	**Test*/p**	**Mean±SD**	**Test*/p**
Year at school								
1st grade	46.67±7.37	p=.000	32.51±5.23	p=.001	10.08±2.71	p=.000	89.26±12.73	p=.000
2nd grade	47.22±5.69		33.68±4.13		10.93±2.68		91.85±10.08	
3rd grade	48.69±5.77		33.93±4.70		11.53±2.86		94.16±11.02	
4th grade	50.22±6.11		35.54±4.20		12.09±2.87		97.86±11.59	
Place of residence stayed longest								
Rural area - village	47.30±4.80	p=.195	32.22±3.30	p=.005	9.70±2.64	p=.003	89.22±8.24	p=.006
District - town	48.54±6.25		34.21±4.73		11.15±2.96		93.92±11.48	
Metropolis - city	48.14±7.15		34.02±5.10		11.40±2.81		93.57±13.10	
Economic status								
Middle	48.32±6.21	p=.944	34.20±4.56	p=.020	11.03±2.78	p=.215	93.56±11.25	p=.245
Low	47.57±7.42		32.42±5.07		10.79±2.96		90.79±13.26	
High	48.32±6.89		34.40±5.13		11.78±3.19		94.51±13.61	
Daily Pad Use								
Yes	48.63±6.88	p*=.156	34.77±4.83	p*=.003	11.20±3.10	p*=.397	94.61±12.77	p*=.022
No	47.88±6.39		33.29±4.71		11.01±2.76		92.18±11.60	
Having been diagnosed with urinary tract infection in the last year								
Yes	46.71±7.89	p*=.371	32.12±4.88	p*=.025	10.87±3.10	p*=.688	89.71±13.60	p*=.157
No	48.34±6.38		34.05±4.75		11.10±2.86		93.50±11.82	
Bathing Position								
Standing	48.31±7.00	p*=.009	34.10±4.80	p*=.002	11.36±2.75	p*=.001	93.78±12.67	p*=.001
Sitting	45.70±4.91		45.70±4.91		9.25±2.67		85.80±9.65	
Both standing and sitting	48.43±5.24		48.43±5.24		10.71±3.18		93.05±9.72	
None of the above	48.04±10.46		32.86±6.24		10.59±3.66		91.50±18.04	

* *Kruskal Wallis Test*

Discussion

Today, many women frequently present to gynecology outpatient clinics due to vaginal and urinary tract infections, especially during the period from menarche to climacteric[1]. The review of the domestic and international literature demonstrates that there are studies reporting that the development of vaginal infection is associated with genital hygiene behaviors[12-14]. However, it is striking that there are no studies in which the effects of genital hygiene behaviors on VI and UTI are investigated. The present study was conducted to determine genital hygiene behaviors of the midwifery and nursing students and the effects of these behaviors on VI and UTI. The results of the present study were compared with the results obtained from other studies conducted on genital hygiene behaviors and the effects of these behaviors on VI or UTI.

The similarity of the groups in terms of their socio-demographic and descriptive characteristics (age, weight, height, economic situation, smoking, alcohol use, family type, genital area cleaning, daily pad usage, bathing position, method of removing the hair in the genital area (the pubic hair), and signs of genital infection) is important for the reliability of the study. The results of the study are similar to those of national and international studies[12-14,23,24].

All of the practices performed for the cleaning of the genital organs constitute genital hygiene behaviors[15]. Of the students participating in the present study, 70.2% cleaned the genital area with water and toilet paper. In Kartal's study conducted with midwifery students (2020), of the students, 82.3% cleaned their genital areas only with water and 57.7% only with toilet paper[23]. In their descriptive study conducted with first-year nursing students (2015), Topuz et al. determined that 83.7% of the participants used water and toilet paper to clean their genital areas[14]. Our review of other studies conducted in Turkey indicated that in Küçükkelepçe's study including students (2019), 68.4% of the participants used water and toilet paper to clean their genital areas, and in Bilgiç's study (2018), of the students, 50.2% used water, 31.5% used toilet paper to clean their genital areas[11,27]. According to our review of studies conducted abroad, mostly soap and liquids containing antiseptic are used to clean the genital area[12,13,19]. Our study results are consistent with those of the studies in Turkish literature but different from those of the studies conducted abroad. The difference probably stems from the effects of cultures on genital hygiene practices[28].

Various methods are used to remove the hair in the genital area (the pubic hair). In the literature, although some people suggest that removing the hair in the genital area (the pubic hair) may have potential side effects varying from one method to another, removing the hair in this area is stated to have a protective effect against diseases[29]. In the present study, of the participants, 36.9% removed the hair in the genital area (the pubic hair) by using razor blades and 25.6% by using wax. In several studies conducted with were examined, both groups used wax and razor blades

(31.1%-51.7% and 25.1%-37.1% respectively), in removing the hair in the genital area (the pubic hair)[11,17]. These results are consistent with the results of our study.

In our study, 11.3% of the participants were diagnosed with UTI in the last year, 30.5% had a history of previous UTI and 8.9% had a history of genital infections such as yeast infection, genital herpes or vaginitis. The review of studies conducted with female students in our country revealed that the incidence of UTI and genital infection varied between 18.5% and 30.6%[11,30,31] and between 9.1% and 10.3% respectively[11,31]. The rates of genital infection and urinary tract infection in the present study are consistent with those in the studies mentioned in the previous sentence.

Among the reasons for adolescent girls to present to health institutions, the first three are vaginal discharge, itching and burning (vaginal discharge, itching and burning take the lead respectively)[32,33]. Therefore, it is important to raise their awareness of vaginal discharge is of great importance. In the present study, of the students 82.3% suffered from vaginal discharge, 67.4% had a little amount of vaginal discharge, 56% had clear, transparent vaginal discharge, and 56.3% had odorless vaginal discharge. In Bilgiç et al.'s study (2018), of the participating students going to university, 69.8% had vaginal discharge, 47.7% had a little amount of vaginal discharge, 44.8% had clear, transparent vaginal discharge, and 51.6% did not know whether the vaginal discharge was odorous[11]. In the present study, the data were collected online during the Covid-19 pandemic, because the students received no formal education of any kind (were excluded from any formal education) during the pandemic. Therefore, most of the students stayed with their families. The results of our study are different from those of Bilgiç et al.'s study (2018) because, although the students in their study were university students, they were not midwifery or nursing students; therefore, their education curriculum did not have courses on genital hygiene, and because they stayed in dormitories, not with their families.

In several studies in the literature, the authors tried to determine the level of genital hygiene behaviors of women[12, 21, 23, 24, 34, 35]. In the present study, the mean score the midwifery and nursing students obtained from the overall GHBS was 93.07 ± 12.07, and there was no statistically significant difference between the groups. In Pete et al.'s study conducted with pregnant women (2019), women's knowledge and behaviors about genital hygiene were at an acceptable level[34]. Similarly, in Kartal et al.'s study (2020), the mean score the midwifery students obtained from the overall GHBS was 95.25 ± 8.57, and their genital hygiene behaviors were at a good level[23]. In Calik et al.'s study conducted with married women (2020), the mean score the women obtained from the overall GHBS was 77.41 ± 9.05, and their genital hygiene behaviors scores were slightly above the average, and Calik et al. stated that wrong and inadequate genital hygiene behaviors increased the risk of vaginal infection in women[21]. In Demirag et al.'s study conducted with the students of Vocational School of Health Services (2019), the mean score the students obtained from the overall GHBS was 86.89 ± 7.124, and their genital hygiene behaviors were at a good

level[24]. In the literature, it is stated that a high mean score obtained from the overall GHBS means that the person has good genital hygiene behaviors. In the present study, the midwifery and nursing students were determined to have good genital hygiene behaviors, which was consistent with the findings of other studies.

Educational status of women is among the factors affecting their genital hygiene behaviors[23, 36-38]. In the present study, the higher the students' year at school was, the better their genital hygiene behaviors were. Our review of the literature for studies in which the relationship between genital hygiene behaviors according to the education level of women was investigated demonstrated that very few studies were conducted on the issue. In Şeker et al.'s study (2020), genital hygiene behavior levels of women with high school and university education were higher than were those of women with lower education[35]. In Kartal et al.'s study (2020), the first grade students obtained the lowest mean score from the overall GHBS[23]. In their study conducted with nursing students (2019), Bulut and Çelik stated that genital hygiene behaviors of the participants improved as their year at school increased, but that the highest total score was obtained by the 3rd grade students[36]. In Bozeli's study in which genital hygiene attitudes of health vocational high school students were investigated (2018), the 11th grade students obtained higher genital hygiene behavior scores than did the 10th and 12th grade students, which was due to the fact that the genital hygiene training was given in the 11th grade[39]. On the other hand, in Bitew et al.'s study (2017), bacterial vaginosis was more common in women with primary and secondary education than it was in illiterate women[40]. The results of our study were consistent with the results of other studies in the literature. The higher a woman's education level is, the more knowledgeable she is about genital hygiene behaviors and vaginal infections[21]. It can also be thought that the increase in vocational training in the midwifery and nursing education may have a positive effect on genital hygiene behaviors.

The number of studies in which the relationship between the place of residence stayed longest and genital hygiene behaviors is investigated is limited[22, 36]. Our search for studies in which the relationship between the place of residence stayed longest and genital hygiene behaviors was investigated demonstrated that while a few studies were conducted in our country, Turkey, no studies were conducted on the issue abroad. In Bulut and Çelik's (2019) and Çankaya and Yılmaz's (2015) studies, there was no statistically significant correlation between the place of residence stayed longest and the mean scores for the overall GHBS[22, 36]. Contrary to the results of a limited number of studies in the literature in which the relationship between the place of residence stayed longest and genital hygiene behaviors, in the present study, a statistically significant correlation was determined between the place of residence stayed longest and the mean scores obtained from the overall GHBS. While the students whose place of residence stayed longest was a metropolis or city obtained the highest mean scores from the GHBS, the students whose place of residence

stayed longest was a rural area or village obtained the lowest mean score. This is probably because the students in the former group had relatively a greater number of social opportunities (internet, library, etc.) than did the students in the latter group, which may have enabled them to access information about genital hygiene behaviors and indirectly affected their genital hygiene behaviors in a positive way.

In the present study, a statistically significant correlation was found between the students' income status and the mean scores the obtained from the menstrual hygiene sub-dimension of the GHBS. In their study (2020), Durmus and Zengin investigated women's genital hygiene behaviors and determined a statistically significant correlation between the scores they obtained from the overall GHBS and its Menstrual Hygiene and Abnormal Finding Awareness sub-dimensions[16]. In Çalik et al.'s (2020), Cankaya's (2015) and Karadeniz et al.'s (2019) studies in which women's genital hygiene behaviors were investigated, of the participants, those who perceived their economic status as moderate or good obtained high scores from the Genital Hygiene Behavior Scale, and there was a statistical difference between their scores and the other participants' scores[21, 22, 41]. On the other hand, in Karakale's (2020), and Cankaya and Ege's (2014) studies in which they investigated women's genital hygiene behaviors, and in Kartal et al.'s study conducted with midwifery students (2020), it was determined that the participants' income status had no effect on their genital hygiene behaviors[23,42,43]. That the results about whether the income status affects genital hygiene behavior in the present study were different from the results of other studies may have stemmed from the differences how the participants perceived their income status.

The incidence of vaginal infections is related to genital hygiene behaviors[12-14]. In our study, a statistically significant correlation was determined between the variable having been diagnosed with urinary tract infection within the last year and the mean score for the menstrual hygiene sub-dimension of the GHBS. Of the students, those who were diagnosed with urinary tract infection within the last year obtained a lower mean score from the menstrual hygiene sub-dimension of the GHBS than did the other students. Contrary to this study, in Durmuş and Zengin's study (2020) in which the genital hygiene behaviors of women were investigated, the analysis of the women's GHDS scores in terms of their having a genital disease previously demonstrated that of the participants, those who had a genital disease obtained a higher mean score from the overall GHDS than did those who did not have a genital disease[16]. In Çankaya and Ege's study (2014), the Genital Hygiene Behavior Scale scores of women with and without a diagnosis of UTI in the last year were compared, and of the women, those who were not diagnosed with UTI obtained higher scores; however, the difference between their scores and the scores of those who were diagnosed with UTI was not statistically significant[42]. These differences may have stemmed from the fact that the sample groups of the studies were different and that the mean ages of the participants in these groups were not similar.

In several studies, it was reported that daily pad use increased the risk of infection[1,44]. In the present study, 36.6% of the students used daily pads. Our review of the literature indicated that in studies conducted with nursing students, female health workers and women, more than 50% of the participants used daily pads[1, 11, 14, 45, 46]. Given that the use of daily pads increases the risk of infection according to the studies reviewed, it is pleasing that the rate of daily pad use of the students participating in our study was lower than was that the literature. In their study conducted with 1st year female students at the faculty of health sciences (2015), Topuz et al. compared the students' use of daily pads in terms of their perception of income status and reported that the rate of daily pad use was higher among the students whose income was higher than their expenses, and that the difference between the students whose income levels were different was statistically significant[14]. The fact that the mean scores obtained from the overall GHBS and its Menstrual Hygiene sub-dimension by the students who used daily pads were higher than were those obtained by the students who did not use daily pads can be explained by how they perceived income status.

Bathing is part of hygiene behaviors. Bathing helps to remove sweat, dead cells, oil and microorganisms from the skin[47]. Taking a bath in a sitting position in a basin or bathtub where water accumulates is not recommended due to the high probability of the presence of bacteria in the water; on the contrary, taking a shower in a standing position is stated to prevent VIs and UTIs[48-50]. In our study, a statistically significant correlation was determined between the bathing position and the mean scores for the overall GHBS and its sub-dimensions. The mean score obtained by the students who took a shower in a standing position (72.7%) was higher than were those of the students who took a bath in a sitting position, or both in sitting and standing positions. In Dalbudak and Bilgili's study conducted with women who presented to the obstetrics and gynecology outpatient clinic (2013), 69% of the participants in the intervention group and 74% of the participants in the control group took a shower in a standing position[51]. In their study (2019), in which Küçükkelepçe et al. gave genital hygiene training to secondary school female students and evaluated the way they took a shower after the training, they determined that 71% of the students took a shower in a standing position after the training[27, 51]. In Bilgiç et al.'s study conducted with female students living in the dormitory (2018), 89.3% of the students took a shower in a standing position during their menstrual period. In Akca and Türk's study conducted with women (2021), 56.3% of the participants took a shower in a standing position[11,17]. The rate of the students taking a shower in a standing position in the present study is consistent with the rates of the participants in the aforementioned studies. The fact that taking a shower in the standing position prevents VIs and UTIs supports the participating students' obtaining high mean scores from the overall GHBS and its sub-dimension in our study, because they took a shower in the standing position.

Limitations

Because the data obtained in the present study are limited to the measurement tools used and based on the individual statements of the students participating in the study, the results obtained from this study are applicable only to the midwifery and nursing students surveyed and cannot be generalized to all midwifery and nursing students.

Conclusion

In line with the findings of our study, it was concluded that the genital hygiene behaviors of midwifery and nursing students were at a good level and that the higher their year at school was, the better their genital hygiene behaviors were. In addition, factors such as the higher economic level, the habit of taking a shower in a standing position, use of daily pads, living in a city or a metropolis also increased the score they obtained from the Genital Hygiene Behaviors Scale. Another important result of our study is that the students diagnosed with urinary tract infections in the last year displayed worse genital hygiene behaviors. Within this context, it is recommended that midwifery and nursing students should be given training on genital hygiene in the first year of their education, and that the same training should be given to other female university students within the scope of peer education programs, and to women within the scope of practice courses or projects.

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