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## Comparison of Genital Hygiene Behaviors of International and National Female Students

**Abstract**

This study aimed to compare the genital hygiene behaviors of international and female national students. This cross-sectional study was conducted with 170 students, 85 international and 85 national students, using the random sampling method. Data were collected using a self-report approach with a personal information form and the Genital Hygiene Behavior Scale. The gathered data were analyzed employing the chi-square test and the significance test to assess the difference between two means. The mean score on the menstrual hygiene habits subscale was significantly higher in national students (32.51±3.88) than in international students (29.54±3.54) (p<0.001); the mean total score on the Genital Hygiene Behavior Scale was significantly higher in national students (94.45±7.96) than in international students (89.51±9.07) (p<0.001). International students received information about the menstrual period mostly from friends (p<0.001), did not prefer to change menstrual products at school (p=0.005), preferred soap/shampoo/cosmetic products more for genital area cleaning (p<0.001), and used menstrual pads significantly less compared to national students (p=0.014). In this study, the total score on the Genital Hygiene Behavior Scale and the score on the menstrual hygiene habits subscale were higher in national students than in international students. International students received information about menstrual periods mostly from their friends, used products in addition to menstrual pads during menstruation, and preferred to use soap, shampoo, and cosmetic products for genital hygiene. It is recommended that health professionals plan training on good genital hygiene practices for both international and national students.

**Keywords:** Hygiene, internationality, menstruation, students, women's health.



### Uluslararası Öğrenciler ile Yerel Öğrencilerin Genital Hijyen Davranışlarının Karşılaştırılması

**Öz**

Bu çalışmanın amacı uluslararası öğrenciler ile yerel kız öğrencilerin genital hijyen davranışlarını karşılaştırmaktır. Kesitsel tipteki çalışma rastgele örnekleme yöntemi kullanılarak 85 uluslararası öğrenci, 85 yerel öğrenci olmak üzere 170 öğrenci ile gerçekleştirildi. Çalışmada veriler kişisel özellikler bilgi formu ve genital hijyen davranışları ölçeği kullanılarak özbildirim yöntemiyle elde edildi. Ki-kare testi ve iki ortalama arasındaki farkın önemlilik testi kullanılarak veriler analiz edildi. Menstrual hijyen alışkanlıkları alt boyut puanı ortalaması yerel öğrencilerde (32.51±3.88) uluslararası öğrencilere (29.54±3.54) göre (p<0.001); yerel öğrencilerin genital hijyen davranışları ölçeği toplam puan ortalaması (94.45 ±7.96), uluslararası öğrencilere göre (89.51±9.07) anlamlı şekilde daha yüksek bulundu (p<0.001). Uluslararası öğrencilerin yerel öğrencilere göre menstruasyon dönemi hakkında çok bilgiyi arkadaşından aldığı (p<0.001), okulda menstrual ürünleri değiştirmeyi tercih etmediği (p=0.005), genital bölge

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temizliğinde sabun/şampuan/kozmetik ürünleri daha fazla tercih ettiği ( $p<0.001$ ) ve hijyenik ped kullanımının anlamlı şekilde daha düşük olduğu bulundu ( $p=0.014$ ). Bu çalışmada yerel öğrencilerde genital hijyen davranışları ölçeği toplam puanı ile menstrual hijyen alışkanlıkları alt boyut puanının uluslararası öğrencilere göre daha yüksek olduğu saptandı. Uluslararası öğrencilerin menstruasyon dönemi hakkında en çok bilgiyi arkadaşlarından aldıkları, menstruasyon döneminde hijyenik pedler harici ürünlerde kullandıkları ve genital hijyen temizliğinde sabun, şampuan ve kozmetik ürünlerinin kullanımını tercih ettikleri bulundu. Sağlık profesyonellerinin hem uluslararası hem de yerel öğrencilere iyi genital hijyen uygulamaları konusunda eğitim planlaması önerilir.

**Anahtar kelimeler:** Hijyen, uluslararası, menstrüasyon, öğrenciler, kadın sağlığı.



### Introduction

Genital infections are a significant health issue for women, adversely affecting their sexual health, family dynamics, and overall quality of life.<sup>1,2</sup> Genital infections occur due to not washing hands during menstruation, using inappropriate underwear, or not paying enough attention to hygiene.<sup>3</sup> Genital hygiene involves the practices and care routines necessary to protect the urogenital organs from infections, maintain their structural health, and support proper physiological functioning.<sup>4,5</sup> Genital hygiene behaviors are shaped by various factors, including values, habits, body image, beliefs, socioeconomic status, culture, level of knowledge, family dynamics, environmental conditions, and the menstrual cycle.<sup>6</sup> Promoting proper genital hygiene practices among women and addressing incorrect behaviors are crucial measures in the prevention of infections.<sup>7</sup>

As a result of increasing internationalization and globalization, Türkiye hosts over 300.000 international students from 198 countries as of 2022.<sup>8</sup> It is known that international female students who leave their countries experience changes in menstrual symptoms, during the adaptation period, various factors, including somatic and psychological symptoms, as well as cultural barriers, sleep patterns, and academic stress significantly influence changes in menstrual symptoms.<sup>9</sup> Furthermore, the attitudes of international female students toward menstruation are profoundly shaped by the cultural and religious backgrounds of their places of birth and upbringing.<sup>10</sup> Moreover, restrictive health insurance and difficulties in applying to a foreign health system hinder international students' access to sexual health services.<sup>11</sup> It is therefore important to determine the genital hygiene behaviors of international students from different cultures. However, in order to fully understand the genital hygiene behaviors of international students, it is necessary to also evaluate the behaviors of national students who share the same educational environment and similar contextual conditions. National students more closely reflect the cultural, religious, and social norms of the society in which they live. Therefore, comparing international and national students makes the influence of cultural differences on genital hygiene practices more visible and provides a stronger basis for interventions aimed at preventing incorrect or inadequate practices. The goal of this study was to compare the genital hygiene practices of international and national female students.

### Materials and Methods

#### Design

The study has a cross-sectional design.

#### Population and Sample

The study population consisted of 398 female students (91 international and 307 Turkish students) who were enrolled in the first grade at the Faculty of Health Sciences (Nursing, Midwifery, Physiotherapy and Rehabilitation, Dietetics Departments) affiliated to a state university in the 2023-2024 academic year. No sampling method was used to recruit international female students and all international female students who wanted to participate in the study were included in the study (Six international students declined to participate in the study). National students at an equal number of international students included in the sample from each department were included in the sample with the help of computerized random numbers. The study was conducted with a total of 170 students, 85 international and 85 national students. At the end of the study, a post hoc power analysis conducted using the G\*Power 3.1.7 software for the Student's t-test revealed that the statistical power of the study was found to be 98%.

#### Inclusion Criteria

- Those who volunteered to participate in the study and,

- Those who had not previously received training on genital hygiene behaviors were included in the study.

**Data Collection**

For the study, the students included in the study sample were invited to an empty classroom outside of course hours. The data of the students whose written and verbal consent was obtained were obtained through the self-report method under the supervision of the female researcher. Data collection took 15 minutes on average.

The data were obtained using a personal information form and the Genital Hygiene Behavior Scale.

**Personal information form:** The form consisted of 23 questions regarding students' sociodemographic characteristics and their knowledge and practices about the menstruation period.

**Genital Hygiene Behavior Scale (GHBS);** The scale, developed by Karahan in 2017, has been established for validity and reliability. This 23-item Likert-type scale is scored on a range from 1 to 5. It comprises three subscales: the first 12 items assess general hygiene, items 13 to 20 evaluate menstrual hygiene, and items 21 to 23 measure awareness of abnormal findings. Items 7, 14, 19, 20, and 23 are reverse-coded. The minimum possible score on the scale is 23, while the maximum is 115. A higher score indicates that a woman demonstrates good genital hygiene practices.<sup>12</sup>

**Statistical Analysis**

The statistical evaluation of the data collected in the study was conducted using the IBM SPSS software version 20.0 (Statistical Package for the Social Sciences, Chicago, Illinois). The Kolmogorov-Smirnov test was applied to assess whether the data followed a normal distribution. Descriptive statistics were presented as mean, standard deviation, frequency, and percentage (%). For comparing proportions of categorical variables, Chi-square, Fisher's exact tests and Yates correction chi-square test were utilized. To compare continuous variables, an independent samples t-test was performed to determine the significance of differences between two means. A p-value of less than 0.05 was considered statistically significant.

**Results**

Of both international and national students who participated in the study, 31.7% (n=27) were enrolled in the nursing department. Of the international students, 30.6% (n=26) were from Turkmenistan. The number of international students who lived at home with friends was significantly higher than that of national students (p<0.001). The percentage of national students (85%) whose income was higher than their expenses was significantly higher than that of international students (15%). No statistically significant difference was found between international and national students in terms of their religious beliefs. (p>0.05) (Table 1).

**Table 1.** Comparison of descriptive characteristics of international and national students

		National Student n (%)	International Student n (%)	Test
Departments**	Nursing	27 (31.7)	27 (31.7)	-
	Physiotherapy and Rehabilitation	27 (31.7)	27 (31.7)	
	Midwifery	22 (25.9)	22 (25.9)	
	Nutrition	9 (10.7)	9 (10.7)	
Nationality**	Turkmenistan	-	26 (30.6)	-
	Azerbaijan	-	6 (7.0)	
	Syria	-	13 (15.2)	
	Iran	-	3 (3.6)	
	Iraq	-	2 (2.3)	
	Arabia	-	2(2.3)	
	Sudan	-	7(8.2)	
	Morocco	-	6(7.0)	
	Egypt	-	3 (3.6)	
	Chad	-	6 (7.0)	
	Gabon	-	2 (2.3)	
	Guinea	-	2(2.3)	
	Kenya	-	3 (3.6)	
	Somali	-	1 (1.1)	
Afghanistan	-	2 (2.3)		
Residence	State dormitory	69 (95.8)	3 (4.2)	x <sup>2</sup> =160.602 p<0.001*
	Private dormitory	2 (5.0)	38 (95.0)	
	At home with family	14 (66.7)	7 (33.3)	
	At home with friends	0 (0.0)	37 (100.0)	

Income status	Income < expenses	26 (59.0)	18 (41.0)	$\chi^2=16.199$ <b>p&lt; 0.001*</b>
	Income = expenses	42 (39.6)	64 (60.4)	
	Income > expenses	17 (85.00)	3 (15.0)	
Religious Belief	Muslim	85 (50.9)	82 (49.1)	p=0.246*
	Christian	0 (0.0)	3 (100.0)	

$\chi^2$ = Chi-square test was used, \*=Fisher's exact test was used; Row percentage was given.

International students received information about the menstrual period from friends the most during menstruation ( $p<0.001$ ), did not change menstrual products at school ( $p=0.005$ ), and preferred soap/shampoo/cosmetic products for genital area cleaning ( $p<0.001$ ) compared to national students. National students had more difficulty in attending class and concentrating during menstruation compared to international students ( $p=0.008$ ), and national students used menstrual pads during menstruation at a significantly higher rate than international students ( $p=0.014$ ) (Table 2).

**Table 2.** Comparison of genital hygiene behaviors of international and national students

		National Student n (%)	International Student n (%)	Test
Status of believing that she has enough knowledge to manage her menstrual period	Yes	56 (47.1)	63 (52.9)	$\chi^2=1.008$ p= 0.315**
	No	29 (56.9)	22 (43.1)	
The person asked for information about the menstrual period the most	Mother	74 (57.4)	55 (42.6)	$\chi^2=10.414$ <b>p&lt;0.001**</b> <b>p=0.014*</b>
	Friend	11 (26.8)	30 (73.2)	
	Menstrual Pad	85 (52.1)	78 (47.9)	
The most used menstrual products	Cloth, toilet paper	0 (0.0)	7 (100.0)	
Status of changing menstrual products at school	Yes	77 (55.4)	62 (44.6)	$\chi^2=7.733$ p= <b>0.005**</b>
	No	8 (25.8)	23 (74.2)	
Absenteeism from school during menstruation	Yes	30 (46.9)	34 (53.1)	$\chi^2=0.401$ p=0.318
	No	55 (51.9)	51 (48.1)	
Status of having difficulty in participation in class and concentration during menstruation	Yes	67 (57.3)	50 (42.7)	$\chi^2= 7.018$ <b>p=0.008**</b>
	No	18 (34.0)	35 (66.0)	
The most frequently used product for genital area cleaning	Water	76 (62.8)	45 (37.2)	$\chi^2=25.550$ <b>p&lt;0.001**</b>
	Soap/ Shampoo	9 (22.5)	40 (77.5)	
	/Cosmetics			
History of genital infections	Yes	12 (48.0)	13 (52.0)	$\chi^2= 0.000$ p=1.000**
	No	73 (50.3)	72 (49.7)	
Status of needing training on genital hygiene behaviors	Yes	23 (41.1)	33 (58.9)	$\chi^2= 2.157$ p=0.142**
	No	62 (54.4)	52 (45.6)	

$\chi^2$ = Chi-square test was used, \*= Fisher's exact test was used; Row percentage was given, \*\*Yates correction chi-square test was used.

The mean menstrual hygiene habits subscale score of national students ( $32.51 \pm 3.88$ ) and their mean total score on the GHBS ( $94.45 \pm 7.96$ ) were significantly higher than the mean menstrual hygiene habits subscale score of international students ( $29.54 \pm 3.54$ ) and their mean total score on the GHBS ( $89.51 \pm 9.07$ ) ( $p<0.001$ ) (Table 3).

**Table 3.** Comparison of total and subscale scores of international and national students on the Genital Hygiene Behavior Scale

	National Student Mean±SD	International Student Mean±SD	Test
General Hygiene Habits Subscale Score	48.61± 4.53	47.04 ± 5.83	t= 1.951 p= 0.053
Menstrual Hygiene Habits Subscale Score	32.51±3.88	29.54 ± 3.54	t= 5.219 <b>p&lt; 0.001</b>
Abnormal Finding Awareness Subscale Score	13.32 ± 1.33	12.92 ± 1.74	t=1.677 p= 0.095
Genital Hygiene Behavior Scale Total Score	94.45 ± 7.96	89.51 ± 9.07	t=3.773 <b>p&lt; 0.001</b>

t= The significance test for the difference between two means was used

### Discussion

In this study, the total score on the GHBS and the menstrual hygiene habits subscale score were found to be significantly higher in national students than in international students. Similar to our findings, in a study in which menstrual hygiene practices of Rohingya and Bangladeshi adolescent girls were evaluated, it was reported that 28.7% of Rohingya girls living in Bangladesh and 56.6% of Bangladeshi girls

had knowledge of premenstrual hygiene.<sup>13</sup> In another study in which beliefs and practices of adolescent girls in Lebanon regarding menstrual hygiene were assessed, the frequency of changing menstrual pads and showering during menstruation was found to be similar to that of non-Lebanese students.<sup>14</sup> The literature suggests that young people in low- and middle-income countries encounter difficulties with menstrual hygiene practices, primarily due to cultural, religious, and social constraints, along with widespread misinformation.<sup>15</sup> International female students' perceptions of menstruation are predominantly influenced by the cultural norms and religious values of their countries of origin.<sup>10</sup> Our study is the first in the literature to compare the genital hygiene behaviors of international and national students. Considering the rapidly increasing number of international students coming to Türkiye from low- and middle-income countries, it is thought that this study will guide the evaluation of the genital hygiene behaviors of students from different nationalities. Identifying menstrual hygiene behaviors and ensuring menstrual hygiene can help protect health from infections, skin irritation, and other urogenital system diseases. Otherwise, women who adopt inappropriate genital hygiene practices are more likely to develop genital infections.<sup>1</sup>

In this study, the number of national students who received information about menstrual period from their mothers were found to be significantly higher than the number of international students. Likewise, in the literature, it has been found that the primary source of information about the menstrual period among university students is the students' mothers in studies conducted in our country,<sup>16</sup> Saudi Arabia, Ghana, and Palestine.<sup>17,18</sup> Contrary to the literature, approximately two-thirds of the international students in this study reported friends as their main source of information. This may be related to living away from their families, facing adaptation challenges due to different cultures and family structures, and encountering language barriers.<sup>19</sup> Moreover, in many societies, menstruation is still associated with privacy, is not openly discussed within the family, and is often regarded as a 'shameful' or 'taboo' topic.<sup>15,20</sup> Studies have shown that the generation gap between mothers and daughters can act as a barrier to effective communication about puberty, potentially prompting adolescent girls to seek guidance from peers or alternative sources instead of their mothers.<sup>21</sup> Consequently, mothers may be hesitant to provide information, and young women may tend to turn to peer groups, which they perceive as safer, to share experiences and obtain knowledge. These findings underscore the importance of providing reliable and accurate information about menstruation through health professionals, especially for international students, rather than relying solely on mothers or peers.

This study revealed that national students used menstrual pads during menstruation at a significantly higher rate than international students. Likewise, in studies involving undergraduate nursing students in Türkiye, it was reported that more than 80% of the students used menstrual pads during menstruation.<sup>22,23</sup> In contrast, in low-income countries, it is estimated that only one in 10 girls have access to sanitary pads.<sup>24</sup> Similarly, research in South Sudan found that two-thirds of adolescents used unsanitary materials during menstruation due to financial barriers to accessing hygienic products, and 78% of young girls were unable to attend school because of the unaffordable cost of menstrual pads.<sup>25</sup> In numerous low- and middle-income countries, girls are less inclined to buy and use menstrual pads, often resorting to homemade alternatives like old cloth, cotton, and paper. In numerous low- and middle-income countries, girls are less inclined to buy and use menstrual pads, often resorting to homemade alternatives like old cloth, cotton, and paper.<sup>15</sup> In our study sample of low- and middle-income international students, we did not inquire about the purchase of menstrual pads. However, one possible explanation for the significantly higher use of menstrual pads among national students compared to international students may be the greater proportion of national students whose income exceeded their expenses.

In this study, the use of soap/shampoo/cosmetic products for genital hygiene was found to be significantly higher in international students (77.5%) compared to national students (22.5%). Consistent with our results, a study involving undergraduate midwifery students in Türkiye reported that just 16.6% of participants used soap for genital hygiene.<sup>26</sup> In another study in which first-grade students in nursing and physiotherapy and rehabilitation departments of the faculty of health sciences were included, it was reported that very few of the students used soap to clean the genital area.<sup>22</sup> In a study conducted in Ethiopia, it was found that 35.1% of girls used soap and water for genital hygiene during menstruation.<sup>27</sup> In another study conducted in India, it was reported that about half of the girls used only water for cleaning, 9.4% used soap and water, 9.4% used disinfectants, and 30.5% used other special medical soaps.<sup>28</sup> Using soap or shampoo to clean the genital area can impact the vaginal microbiota and may increase the risk of vaginal symptoms, as opposed to cleaning with water alone.<sup>29</sup> It is thought that the reason why international students use soap/shampoo/cosmetic products more than water for genital hygiene may be the lack of knowledge about menstrual hygiene. Additionally, attitudes and behaviors regarding menstruation and menstrual hygiene are significantly influenced by individuals' social, cultural, economic, and religious

backgrounds.<sup>30</sup> For instance, some studies indicate that Afro-Caribbean immigrants are more likely than Caucasian women to wash their vulvas with foaming baths or antiseptic solutions, reflecting a cultural emphasis on rigorous body cleanliness for health and well-being.<sup>31</sup> In certain Orthodox Jewish communities, women perform ritual immersion in a mikveh following menstruation or childbirth as a form of purification. Similarly, in Islam, both men and women are instructed to perform a full-body ablution (ghusl) after sexual activity or menstruation. Furthermore, in some regions of Mozambique and South Africa, women internally cleanse their vaginas using solutions such as lemon juice, salt water, or vinegar to remove vaginal discharge and to prevent or treat sexually transmitted infections.<sup>32</sup>

This study has several limitations. It was conducted with a sample drawn from a single province and a single faculty. Due to the limited number of international students in the population, only numerical equivalence was ensured when selecting national students; however, balance in terms of sociodemographic variables could not be fully achieved. Additionally, the absence of an a priori sample size calculation before the initiation of the study represents another limitation.

### Conclusion

In this study, it was found that the total score of both international and national students on the GHBS was above the moderate level. The total score on the GHBS and the menstrual hygiene habits subscale score were found to be higher in national students compared to international students. It was found that international students received information about the menstrual period mostly from their friends, used products in addition to menstrual pads during menstruation, and preferred to use soap, shampoo, and cosmetic products for genital hygiene. It is recommended that health professionals (physicians, nurses, etc.), who have important roles in the protection and promotion of health, organize training programs to increase the knowledge and awareness of international female students from different cultures about menstrual hygiene. In future studies, it is recommended to form study groups with comparable socio-demographic characteristics or to employ multivariable analyses to control for the influence of these variables, in order to better isolate and understand the independent effect of cultural factors.



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### Declarations:

**1. Ethics Committee Approval:** Ethics committee approval was received for this study from the Social and Human Sciences Research Ethics Committee Ethics Committee of Tokat Gaziosmanpasa University (Date: 26.12.2023, Number: 68).

**2. Informed Consent:** Written and verbal consent was obtained from the students participating in the study.

**3. Author Contributions:** Concept-FO; Design-FO, AK; Supervision-FO, AK; Resources-FO; Materails-FO, AK; Data Collection and/or Processing-FO, AK; Analysis and/or Interpretation- FO; Literature Search-FO, AK; Writing Manuscript-FO; Critical Review-FO, AK.

**4. Declaration of Interests:** The authors declare that there is no conflict of interest.

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### 6. Sustainable Development Goals:





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