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Original Article

Effect of Peer Education on Genital Hygiene Behaviors Among Health Sciences Students: A Quasi-Experimental Study

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Abstract

Background: Given the high prevalence of genital infections and the need to strengthen educational approaches that improve preventive health behaviors, effective and sustainable educational strategies are essential in public health.

Objectives: This study aimed to evaluate the effect of peer education on genital hygiene behaviors among health sciences students.

Methods: This quasi-experimental study with a single-group pretest–posttest design was conducted online among 46 female students enrolled in the Faculty of Health Sciences at Kırklareli University during the 2022–2023 academic year. Participants received a 40-minute, single-session peer education program, and posttest assessments were completed one month later. Data were collected using the Entry Information Form and the Genital Hygiene Behaviors Scale (GHBS). Descriptive statistics, paired-samples t tests, and subgroup analyses based on sociodemographic characteristics were performed. Statistical significance was set at $p < 0.05$.

Results: The mean (SD) total GHBS score increased significantly after peer education, from 95.93 (8.72) to 100.39 (8.19) ($p = 0.019$; Cohen's d = 0.36). The General Hygiene Habits subscale also improved significantly ($p = 0.002$). Greater increases in total GHBS scores were observed among students from other health departments and second-year students, whereas no statistically significant changes were found in the other subscales.

Conclusion: Preliminary findings suggest that peer-led interventions may be feasible and beneficial. However, larger controlled studies are needed to confirm these findings.

Implications for Nursing and Midwifery Preventive Care

- Peer-led education can be integrated into preventive reproductive health programs to improve genital hygiene behaviors among young women.
- Nurses and midwives can use peer education strategies to strengthen reproductive health counselling and health promotion services.
- Early genital hygiene education may support infection prevention and promote positive health behaviors among university students.

Introduction

According to the Turkish Statistical Institute (TÜİK) data for 2023, women constitute 49.94% of the Turkish population, and more than half (51.30%) are of reproductive age (15-49 years) [1]. This period is critically important for women's reproductive health, as genital infections are among the most common health problems affecting this population. These infections occur when microorganisms enter or multiply in the genital system [2], and the anatomical structure of the genital area creates favorable conditions for microbial growth; therefore, appropriate genital hygiene practices are essential for infection prevention [3]. In terms of preventive care, nurses and midwives play a significant role in promoting reproductive health by providing evidence-based education, counseling, and early interventions aimed at preventing genital infections.

University students often live in communal living spaces such as dormitories or shared apartments; this increases the likelihood of inadequate genital hygiene practices. Common inappropriate behaviors regarding genital hygiene, such as wiping from back to front, excessive washing, leaving the genital area moist, use of synthetic underwear, inadequate menstrual hygiene, irregular bathing, and not washing hands before and after using the toilet, significantly increase the risk of genital infections [4,5]. Therefore, improving genital hygiene behaviors among young women represents an important preventive health approach that can reduce infection risk and support long-term reproductive health outcomes.Since genital hygiene behaviors are shaped early in life, adolescence and young adulthood are crucial developmental stages that affect future reproductive health [6]. Cultural taboos regarding menstruation and genital hygiene can contribute to inadequate information and inappropriate genital hygiene behaviors among young women by limiting communication and access to accurate information [7].

In Türkiye, the prevalence of genital infections among women aged 15-49 ranges from 37.1% to 85%, underscoring the need for preventive reproductive health interventions [8]. In this context, nursing and midwifery professionals have a significant responsibility to provide culturally sensitive education and counseling that improve women's awareness and self-care behaviors [9,10,11]. Although peer education is widely used in health practice and has demonstrated positive effects on sexual and reproductive health outcomes [12-14], limited research has examined its impact on genital hygiene behaviors. Existing studies generally focus on general hygiene or reproductive health and rarely evaluate structured interventions using valid measurement tools such as GHBS. Female university students, who may be at risk due to communal living environments and transitional health behaviors, are underrepresented [7,15,16]. Addressing this gap is important for preventive nursing and midwifery care, as effective educational strategies can be integrated into reproductive health counseling and community-based health practice programs [8,11,14,17].

Peer education has also been shown to be effective in informing university students about HPV and safe sexual practices, as demonstrated by Kömürcü et al. [18,19], further confirming the value of this educational approach in reproductive health. Studies examining genital hygiene behaviors among health sciences students have revealed varying levels of practices, indicating that students in different departments may benefit from tailored educational interventions [20]. Recent studies have emphasized the relationship between genital hygiene behaviors and the prevention of vaginal and urinary tract infections, highlighting the importance of early education for midwifery and nursing students [21]. Planned educational programs have been shown to significantly improve genital hygiene behaviors among adolescent females, suggesting that structured interventions can be effective in promoting reproductive health [22].

Awareness of abnormal genital findings is closely associated with previous health education, reinforcing the need for continuous training programs for young women [23]. Furthermore, nursing students' knowledge and performance regarding hygiene practices have been identified as critical factors in infection prevention, suggesting that similar educational strategies could be effective in genital hygiene contexts [24].

Peer education involves the transfer of knowledge and health-related behaviors among individuals with shared characteristics, empowering young people and promoting healthy behaviors [18]. Peer education can be particularly effective for health sciences students because they serve as both learners and future healthcare providers [6]. Training future nurses and midwives through evidence-based peer education models can also strengthen preventive health practices in future clinical and community settings. Therefore, this study aims to determine the genital hygiene behaviors of female students in the Faculty of Health Sciences and to explore whether participation in a peer-led educational intervention is associated with changes in these behaviors. The findings may provide evidence for nurses and midwives regarding the implementation of peer-led educational interventions as a preventive care strategy to promote reproductive health and prevent genital infections among young women.

Objectives

This study aimed to evaluate the effect of peer-led education on genital hygiene behaviors among female health sciences students.

Methods

Study Design

This quasi-experimental study used a single-group pretest–posttest design to evaluate the feasibility and preliminary effect of a peer-led educational intervention on genital hygiene behaviors.

The study was prospectively registered at ClinicalTrials.gov (Identifier: NCT07464405). A randomized controlled design was not feasible due to institutional constraints. The target population consisted of 2,130 female students enrolled in the Faculty of Health Sciences at Kırklareli University. To ensure adequate statistical power to detect the effect of the educational intervention, the required sample size was determined a priori using G*Power (version 3.1.9.4). Assuming a one-tailed paired-samples t-test (difference between two dependent means), an anticipated effect size (Cohen's d = 0.40), a significance level of 0.05, and a statistical power of 80%, the minimum required sample size was estimated at 41 participants. To compensate for an anticipated attrition rate of 20%, the target sample size was increased to 52 students. A total of 55 eligible students were enrolled and completed the baseline assessment. During follow-up, 9 participants were lost to follow-up, and 46 students completed the one-month post-intervention assessment and were included in the final analysis. The final sample size exceeded the a priori calculated minimum requirement, thereby preserving the planned statistical power to detect the expected intervention effect.

Participants

The target population consisted of 2,130 female students enrolled in the Faculty of Health Sciences during the 2022–2023 academic year. Accordingly, all participants who met the eligibility criteria and completed both the pretest and posttest assessments were included in the final analysis. Given the relatively small final sample size, the findings should be interpreted with appropriate caution. Participants were recruited through voluntary, convenience sampling. An invitation to participate in the peer-led education program was sent via the institutional email system to all female students in the target population. A total of 78 students attended the educational session. Of these, 55 met the eligibility criteria and completed the pretest assessment. One month after the intervention, the posttest assessment was administered, and 46 participants completed it. Nine participants did not complete the posttest assessment and were therefore excluded from the final analysis. Consequently, the final study sample comprised 46 students who completed both the pretest and posttest. Inclusion criteria were: (1) being a female student enrolled in the Faculty of Health Sciences, which includes both domestic and international students; (2) being able to communicate in Turkish, as the educational intervention and study questionnaires were administered in Turkish; (3) reporting no active or chronic genitourinary condition; and (4) providing

electronic informed consent to participate in the study. Exclusion criteria were: (1) having an active or chronic genitourinary condition; (2) being unable to communicate in Turkish; and (3) declining to provide informed consent. Only participants who completed both pretest and posttest assessments were included in the final analysis. Nine participants were lost to follow-up because they did not complete the posttest assessment one month after the intervention.

Intervention/Procedure

A peer educator was selected using the "Who Is This?" sociometric test, based on characteristics such as sociability, trustworthiness, network influence, and perceived helpfulness.

The selected peer educator received structured training from the research team and conducted a supervised pilot session before the main intervention.

The peer-led education session was delivered online via Microsoft Teams.

The training consisted of four educational modules: reproductive anatomy, daily genital hygiene behaviors, menstrual hygiene, and recognition of abnormal genital findings. All participants attended the full training session and completed the posttest assessment one month after the intervention.

Instruments and Measures (Validity & Reliability)

Data were collected using three instruments:

Who Is This? Sociometric Test

The Who Is This? sociometric test is a peer-nomination technique based on established sociometric principles for identifying socially influential and accepted individuals within a group [25].

Participants were asked to nominate peers whom they perceived as trustworthy, approachable, influential, and supportive. The student receiving the most nominations was selected as the peer educator. The research team supervised the administration and evaluation of the sociometric test and had the study supervisors review it to ensure consistency and appropriateness of the selection process. The implementation of the Who Is This? technique followed the guidance provided for its use in educational settings in Türkiye [26].

The Descriptive Information Form

was developed by the researchers based on relevant literature. It consisted of 23 items assessing sociodemographic characteristics and genital hygiene behaviors. As a researcher-developed instrument, content validity was ensured through expert review before data collection.

The Genital Hygiene Behaviors Scale (GHBS)

is a standardized, validated 23-item Likert-type scale consisting of three subdimensions: general hygiene behaviors, menstrual hygiene behaviors, and awareness of abnormal findings. Each item is rated on a 5-point Likert scale. Total scores range from 23 to 115, with higher scores indicating more appropriate genital hygiene behaviors. No cutoff score is used; higher scores reflect better genital hygiene behaviors. The GHBS was originally developed and validated in previous studies demonstrating acceptable construct validity and reliability [13].

In the current study, internal consistency was confirmed using Cronbach's alpha coefficients of 0.84 for the total scale and 0.74, 0.70, and 0.68 for the subdimensions, respectively.

No additional psychometric validation (e.g., factor analysis) was performed in this study, as the GHBS is an already validated instrument; only internal consistency reliability was reassessed in the study sample.

Implementation of the Education

Before the educational intervention, the peer educator was selected from fourth-year midwifery students. To identify the peer educator, the Who Is This? sociometric test was administered to fourth-year midwifery students. The test included items evaluating classmates based on characteristics such as being well-liked, helpful, socially well-connected, friendly in interactions, trusted by peers, and considered reliable. Based on the results of this sociometric assessment, the student who received the most nominations was selected as the peer educator for the genital hygiene education intervention. The

administration of the sociometric test, the final selection of the peer educator, and the preparation of the educational materials were conducted under the supervision of the research team and study supervisors.

After selection, the peer educator received structured training using prepared educational materials. A pilot training session was then conducted to ensure readiness and clarity of delivery.

Following confirmation of preparedness, the final educational session was scheduled and delivered via Microsoft Teams.

All eligible female students enrolled in the Faculty of Health Sciences were informed of the training date and time via their institutional email addresses. Participation in the session was voluntary.

A flowchart illustrating the selection of the peer educator and the intervention implementation process is provided in the manuscript.

Outcome Measures

The primary outcome measure was the change in genital hygiene behaviors, measured by the GHBS total score and its sub-dimension scores, before and 1 month after the peer-led educational intervention.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics version 23. Descriptive statistics were presented as frequencies, percentages, means, and standard deviations.

Data normality was assessed using the Shapiro–Wilk test.

The results indicated that the data were normally distributed; therefore, parametric tests were used for subsequent analyses. Since the data showed a normal distribution, differences between pretest and posttest GHBS scores were analyzed using the paired-samples t-test.

A p-value < 0.05 was considered statistically significant.

Variables

All sociodemographic and background characteristics were treated as descriptive variables. These included age, year of study, department, socioeconomic status, family type, social security status, and residence.

The primary outcome variable was genital hygiene behaviors, measured using the GHBS total score and subdimension scores before and after the intervention [3].

Result

Table1 summarizes the sociodemographic characteristics and genital hygiene habits of the 46 participants.

The mean age was 21.20 (1.70) years. Most participants were midwifery students (69.5%) and in their third year (69%).

Additionally, 78.3% lived in extended families, and 73.9% stayed in dormitories.

Economically, 71.7% considered their financial status equal to or above expenses. Regarding hygiene practices, 84.8% took standing showers, 78.3% used toilet paper for genital cleaning, and 80.4% did not use daily pads.

Table 2 compares pre- and posttest GHBS total scores across selected sociodemographic variables. Posttest scores were significantly higher among students from other health departments (t = –2.591, p = .022), second-year students (t = –3.493, p = .004), those who bathed in both standing and sitting positions (t = –4.756, p = .003), and those who used toilet paper for genital cleaning (t = –2.807, p = .008).

No significant differences were found by residence or daily pad use ($p > 0.05$).

Table 3 presents the pre- and posttest comparisons for the GHBS total score and its subdimensions. The total GHBS score increased significantly from 95.93 (SD =8.72) to 100.39 (SD = 8.19) (t = –2.442, p = .019, Cohen's d = 0.36).

The General Hygiene Habits Subscale also showed a significant rise from 49.13 (SD = 5.29) to 52.52 (SD =3.89) (t = –3.376, p = .002, Cohen's d = 0.50).

No significant changes were observed in the Menstrual Hygiene Habits or Abnormal Findings Awareness subscales ($p > 0.05$).

Table1. Participants' Sociodemographic Characteristics and Genital Hygiene Habits

Characteristics	Value	Range/Percentage
Age	21.20 (1.70)	18–29
Midwifery	32	69.5%
Other Health Departments	14	30.5%
2nd year	13	28.3%
3rd year	29	69.0%
4th year	4	8.7%
Nuclear Family	10	21.7%
Extended Family	36	78.3%
Home	12	26.1%
Dormitory	34	73.9%
Income ≥ Expenses	33	71.7%
Income < Expenses	13	28.3%
Standing Bath	39	84.8%
Standing & Sitting Bath	7	15.2%
Water	10	21.7%
Toilet Paper	36	78.3%
Daily Pad – Yes	9	19.6%
Daily Pad – No	37	80.4%

Note. Other Health Departments include Nursing, Nutrition and Dietetics, Child Development, Physiotherapy and Rehabilitation, and Health Managemen

Table 2. Comparison of Pretest and Posttest GHBS Total Scores by Sociodemographic Characteristics

Variables	Pretest M (SD)	Posttest M (SD)	t	*p*	Cohen's d
Midwifery	97.46 (7.11)	99.59 (9.10)	-1.096	0.281	0.19
Other Health Departments	92.42 (11.12)	102.21 (5.43)	-2.591	0.022	0.69
2nd Year	92.69 (9.21)	103.53 (5.39)	-3.493	0.004	0.97
3rd Year	97.79 (8.22)	99.86 (8.45)	-.923	0.364	0.17
4th Year	93.00 (8.98)	94.00 (11.16)	-.145	0.894	0.07
Standing	97.10 (8.74)	99.51 (8.29)	-1.268	0.213	0.20
Standing & Sitting	89.42 (5.34)	105.28 (5.90)	-4.756	0.003	1.80
Water	97.00 (8.76)	96.50 (9.60)	.141	0.891	0.04
Toilet Paper	95.63 (8.81)	101.47 (7.55)	-2.807	0.008	0.47
Daily Pad – Yes	92.66 (11.66)	103.55 (5.31)	-2.091	0.070	0.70
Daily Pad – No	96.72 (7.85)	99.62 (8.63)	-1.577	0.124	0.26

Note. GHBS = Genital Hygiene Behaviors Scale. Paired-sample t-test was used.

Table 3. Comparison of GHBS Total and Subscale Scores Before and After Training (N = 46)

Scale Dimensions	Pretest M (SD)	Posttest M (SD)	t	*p*	Cohen's d
General Hygiene Habits	49.13 (5.29)	52.52 (3.89)	-3.376	0.002	0.50
Menstrual Hygiene Habits	34.30 (3.94)	35.28 (4.05)	-1.172	0.247	0.17
Abnormal Findings Awareness	12.50 (2.57)	12.58 (2.66)	-0.178	0.859	0.03
GHBS Total Score	95.93 (8.72)	100.39 (8.19)	-2.442	0.019	0.36

Note. GHBS = Genital Hygiene Behaviors Scale. Higher scores indicate better hygiene behaviors.

Discussion

This quasi-experimental study examined the potential contribution of peer education-based genital hygiene training among female students in a Faculty of Health Sciences. The findings showed a statistically significant increase in total GHBS scores after the training; however, the effect size was small. Among the subscales, only the General Hygiene Habits subscale demonstrated a significant improvement, while no significant changes were observed in the other subscales. These findings suggest that peer-led education may have a modest role in supporting certain aspects of genital hygiene behaviors, although the absence of a control group limits causal interpretation. Education plays a key role in shaping hygiene-related behaviors, and structured training is known to influence these practices positively [1]. Peer education knowledge and skill transfer among individuals with similar sociocultural characteristics has proven effective in various health promotion contexts [2]. Consistent with existing evidence, previous studies report that peer education enhances reproductive health knowledge, sexual health behaviors, menstrual health awareness, and preventive practices among adolescents and young adults [3,4,5,6]. Our study similarly demonstrated significant improvements in general genital hygiene behaviors following peer education. Although genital infections are preventable, their high prevalence and potential complications underscore the importance of genital hygiene education [7]. In our study, students' baseline genital hygiene scores were already favorable, likely reflecting their exposure to health-related curricula. GHBS scores increased significantly after peer education. Although a larger increase was observed among students in non-midwifery departments, this finding should be interpreted cautiously because of the limited subgroup size. No significant change was observed among midwifery students following the intervention. This finding may be explained by the inclusion of midwifery students in the study, as part of the target population of health sciences students expected to engage in peer education activities during their training. In addition, midwifery curricula include extensive content on women's health and reproductive health, which may result in relatively higher baseline knowledge and behaviors in this group. Therefore, the absence of a significant change may reflect a ceiling effect, which is consistent with previous studies indicating that advanced training in midwifery education is associated with higher baseline competence in this area [8,9,10,11]. The greater improvement observed among first- and second-year students may reflect their lower baseline knowledge and limited prior

exposure to reproductive health education compared with senior students.

Significant improvement was observed in the General Hygiene Habits Subscale, whereas the Menstrual Hygiene and Abnormal Findings Awareness subscales did not show statistically significant changes. The absence of a significant change in menstrual hygiene habits may be explained by the relatively high baseline levels of menstrual hygiene knowledge and practices among participants, which may have limited the potential for measurable improvement (ceiling effect). Additionally, menstrual hygiene behaviors are often habitual and may require longer or more intensive interventions to achieve significant behavioral change. Differences from studies reporting improvements in menstrual hygiene [12] may stem from sample characteristics or prior education. Similarly, awareness of abnormal findings did not improve, likely because participants, as health sciences students, already had adequate baseline knowledge. Studies reporting gains in this area often include younger populations with lower initial awareness [13,14]. Overall, the findings are consistent with the literature indicating that peer education may contribute to improvements in self-reported genital hygiene behaviors as measured by the GHBS. Peer-led interventions appear to be a feasible and impactful method for enhancing health behaviors among young women, especially those in the early years of their academic training. This study contributes to the existing literature by addressing a relatively underexplored area, namely the effectiveness of peer education specifically targeting genital hygiene behaviors among female health sciences students. While previous studies have largely focused on general reproductive health education or menstrual hygiene awareness, fewer have examined genital hygiene behaviors using a validated scale such as the GHBS within a quasi-experimental peer education design. In addition, most existing research has focused on nursing or general student populations, whereas this study includes a broader health sciences sample, enabling subgroup comparisons across departments and academic years. Therefore, this study provides additional evidence regarding the potential role of peer-led interventions in improving specific hygiene behavior scores and highlights the importance of tailoring educational strategies to students' baseline characteristics. This study has several limitations that should be considered when interpreting the findings. The single-group pretest–posttest design, the lack of randomization and a control group, and the absence of multivariable adjustment limit causal inference and fail to control for confounding variables. The small sample size, drawn from a single faculty at a single university, coupled with participant attrition during follow-up, may have reduced statistical power, introduced selection and response biases, and restricted the generalizability of the findings. Additionally, the use of self-reported questionnaires may have introduced social desirability bias, and the one-month follow-up period captured only short-term effects. Accordingly, the findings should be interpreted with caution; larger, adequately powered controlled studies with longer follow-up are needed to confirm these results.

Conclusion

This study provides preliminary evidence that peer education may improve self-reported genital hygiene behavior scores among female university students.
However, due to the small sample size and lack of a control group, these findings should be interpreted with caution.
Future research with larger samples, control groups, and longer follow-up is necessary to confirm the effectiveness and sustainability of this intervention.

Ethical Consideration

Ethical approval was obtained from theKırklareli University Scientific Research and Publication Ethics Committee (Date: February 17, 2023; No: E-35523585-302.99-78487). Institutional permission was obtained from the Faculty of Health Sciences Dean's Office. Electronic informed consent was obtained from all participants before data collection. The informed consent form was presented on the first page of the online Google Forms questionnaire, and

participants could proceed to the survey only after indicating their agreement to participate.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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Authors' Contributions

Conceptualization: S. Hür, Ö. Hacıoğlu
Methodology: S. Hür, S. Karaman, Ö. Hacıoğlu
Investigation: S. Hür, S. Karaman
Formal Analysis: S. Hür, S. Karaman
Writing – Original Draft: S. Hür, S. Karaman
Writing – Review & Editing: S. Hür, S. Karaman, Ö. Hacıoğlu, A. Şolt Kırca
All authors read and approved the final manuscript.

Artificial Intelligence Utilization

Artificial intelligence tools (ChatGPT 4.0) were used solely for language editing and translation purposes during the preparation of the manuscript. The authors reviewed and edited all AI-generated content and take full responsibility for the final version of the manuscript. AI tools were not used for data analysis, interpretation, or generation of results.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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