

ORIGINAL PAPER**The Effects of Toilet and Genital Hygiene Education on High School Students' Behavior****Nurcan Özyazıcıoğlu, RN, PhD**

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Corresponding Author: Yrd.Doç.Dr. Nurcan Özyazıcıoğlu, Uludağ Üniversitesi, Sağlık Yüksekokulu, Bursa, TURKEY Telephone: 902242942470, e-mail: nurcanozyazicioglu@yahoo.com.tr, nurcanoz@uludag.edu.tr**Abstract****Aims:** This study aims to identify the effects of toilet and genital hygiene education on high school student behavior.**Methodology:** In total, 145 students participated in this study, which took place in January-September 2006. The research design was a single-group pre-test/post-test pre-experiment. The post-test data were obtained by administering the same question form to the participants six months later to determine the effects of the education administered. The sample comprised 145 students, 39 of whom were girls and 106 of whom were boys, studying at Kılıçkaya Boarding Secondary School (Turkey, city of Artvin, Yusufeli town).**Results:** The rate of hand washing before toilet use rose from 66.9% to 79.3%. The rate of failing to keep the genital organs dry decreased from 27.6% to 3.8%. The health education that was delivered led to a noticeable change in the behavior, awareness, and toilet-menstruation hygiene practices of the high school students living in rural areas.**Conclusions:** Behavioral changes in high school students' toilet and menstruation hygiene may be established through health education without negatively impacting the co-operation of health trainers, teachers and family members.**Key Words:** genital hygiene, toilet hygiene, student, education, nursing**Introduction**

Adolescents play a significant role in the reproductive health status of a given population. The World Health Organization (WHO) defines the 10-19-year-old age group as adolescents and considers the 15-24-year-old age group as "young people," due to the intersection of adolescent and youth groups (Adolescent Health and Development, Age groups, 2010). Adolescence is a period of transition from childhood to adulthood that is characterized by rapid physical, psychological, biochemical and social development and maturation.

With respect to hygiene in girls, among the most interesting aspects of this period are menstruation and genital hygiene. In adolescents, the risk of bacterial vaginosis may be higher due to irregular menstrual cycle after menarche, lower estrogen

levels and high vaginal pH (Apter 1997, Lamont et al. 2000). Additionally, the vaginal pH becomes less acidic during menstruation due to the decreased number of lactobacilli and the presence of menstruation fluid. As a result, microorganisms can settle more quickly; microorganisms progressing from the cervical canal gap may lead to infertility (Adams Hillard 2002). Lack of awareness of hygienic health practices and of scientific facts due to socio-cultural restrictions may result in negative health outcomes in adolescents, regardless of sex (Dasgupta & Sarkar 2008). In previous studies, it was found that students are often not aware of basic hygienic practices, such as washing hands before and after toilet use, drying the genital area, bathing position, preferred color and type of underwear and menstrual hygiene (Arıkan, Tortumluoğlu, & Özyazıcıoğlu 2004, Kocakaya 2005, Turan &

Ceylan 2007, Güler et al. 2005, Karatay & Özvarış 2006, El-Gilany, Badawi & El-Fedawy 2005, Adhikari, Kade, Dhungel & Mandal 2007).

Adolescence is the most suitable period for administering educational programs to promote positive health behaviors. The educational brochures and booklets prepared for the adolescent age group focus attention on this topic and fill in the gaps in knowledge (Adams Hillard 2002, Buković et al. 2000). Previous educational programs that have aimed to develop positive behaviors related to toilet hygiene and menstruation, which are areas where a lack of knowledge has been observed, have yielded successful results (Arıkan, Tortumluoğlu, & Özyazıcıoğlu 2004, Kocakaya 2005, Ege & Eryılmaz 2006, Dongre, Deshmukh & Garg 2007).

The guidance of parents and health personnel is necessary in predicting problems that might arise during adolescence and facilitating the transition from childhood to adolescence (Adams Hillard 2002). However, because parents do not reside with their children in boarding schools, this may not always be possible. Negative factors, such as overcrowding in boarding schools, lack of privacy for carrying out menstruation hygiene and failure to discuss the topic (due to its inappropriateness according to cultural and religious customs), may result in a lack of knowledge among both students and their families.

The residence area of the school where the study was performed is in a mountainous area in the Black Sea region, in the northeast of Turkey. It is far from the surrounding towns. Steep and narrow roads make transportation difficult; the mountainous terrain restricts the use of agriculture and stockbreeding as a source of income; due to economic difficulties, there is a high level of migration to other regions. "Kılıçkaya Boarding School" is the only center where the students come from surrounding villages. In general, the issue of menstruation is seen as a taboo and is avoided as a topic of conversation. Although young girls may talk to their mothers and elder sisters about this issue, they can acquire insufficient and incorrect information from their friends.

This research aims to describe the toilet and menstruation hygiene behaviors of high school students, reports the delivery of related health education, and determines the effectiveness of the

health education delivered as a single-group pre-test, post-test, and pre-trial model.

Methods

Setting and Study Design

The research was designed as single-group pre-test, post-test, and pre-trial model. This study included 145 students, 39 of whom were girls and 106 of whom were boys, studying in Kılıçkaya Boarding Secondary School (city of Artvin, Yusufeli town). The research was conducted in February-September 2006. The post-test data were collected six months after administration of the pre-test questionnaire.

Questionnaires and Data Collection

The data were collected via questionnaire forms prepared by the researcher. Different forms were used for boys and girls. The form comprised questions designed to identify students' demographic features and toilet and menstruation hygiene habits. The pre-test question forms were administered to girls and boys separately in the classroom, with the cooperation of the school administration.

Preparation of the Educational Materials and Health Education

PowerPoint presentations were prepared as health education materials (separately for boys and girls). Educational booklets and leaflets were prepared by researchers. The subjects included in educational materials are as follows:

- How to wash hands before and after use of the toilet
 - How to wash the genital area
 - Frequency and position appropriate for bathing
 - Frequency with which underwear are changed
- Additionally, only for female students:
- What is menstruation?
 - Points to be careful about in this period (bathroom, deodorant)

The educational booklets and brochures were distributed to students after receiving approval by the European Union & Ministry of Health and supervision committee. The trainings took place in three stages: education booklets and brochures were distributed after the first training, and follow-up educational sessions were held during the second and third rounds.

Table 1. The distribution of students' toilet hygiene habits according to gender

Genital hygiene practices	Gender				Total	
	Girls		Boys		S	%
	n	%	n	%		
Hand washing before the toilet ($\chi^2=1.018$, df:2, $p=0.601$)						
Yes	24	61.5	73	68.9	97	(66.9)
No	6	15.4	16	15.1	22	(15.2)
Sometimes	9	23.1	17	16.0	26	(17.9)
Hand washing after the toilet ($\chi^2=.912$, df:2, $p=0.634$)						
Yes	38	97.4	104	98.1	142	(97.9)
No	1	2.6	1	0.9	2	(1.4)
Sometimes	-	-	1	0.9	1	(0.7)
Do you dry your genital areas? ($\chi^2=13.682$, df:2, $p=0.001$)**						
Yes	31	79.5	48	45.3	79	(54.5)
No	4	10.3	36	34.0	40	(27.6)
Sometimes	4	10.3	22	20.8	26	(17.9)
The material for drying the genital area ($\chi^2=1.260$, df:1, $p=0.262$)						
Toilet roll	18	51.4	44	62.9	62	(59.0)
Cloth	17	48.6	26	37.1	43	(41.0)
Bathing position ($\chi^2=5.120$, df:4, $p=0.077$)						
On foot	20	51.3	40	37.7	60	(41.4)
Seated	11	28.2	52	49.1	63	(43.4)
Mixed	8	20.5	14	13.2	22	(15.2)

The students were trained on how to wash hands before and after use of the toilet, the importance of drying the genital area, the

appropriate type of underwear, and the importance of having a bath and suitable bathing positions. The girls were also educated with respect to menstruation, bathing, and the use of air deodorants.

The female students were divided into two groups, while the male students were divided in three groups, and all groups were educated about health for 40 or 45 minutes. After the administration of pre-test question forms, follow-up trainings were conducted every two months, and the unperceived issues and problems were dealt with.

Data analysis

Mean and chi-square tests were used for statistical analysis.

The ethical principles of the research

Before starting the research, written permission was obtained from the municipality government, town administration, and city administration of national education, as well as the school administration. Before the aims of the research were explained to students, their voluntary participation was secured.

Results

In this study, 73.1% of the students were male (mean age: 16.66 ± 1.45 years); 57.7% of the boys' families' income equalled their expenditure; 77.2% had a nuclear family; 66.9% of the students washed their hands before use of the toilet, and 97.9% washed their hands after the use of the toilet. On the whole, 54.5% dried their genital areas after washing; 59% used a paper roll while 41% used a cloth; 79.5% of the girls dried the genital area after washing and 51.4% used a paper roll, while 48.6% used a cloth.

The results showed that 41.4% bathed while standing, whereas 43.4% bathed while seated. Among the overall student population, 44.1% used cotton, 33.1% used combed cotton, and 22.8% used flannel underwear. In the study, 32.4% of the girls and 14% of the boys reported having received information on genital hygiene. Survey results showed that 27% of the girls did not bathe during menstruation; 54% reported using deodorant during the menstruation period (Table 1). Genital habits improved following health education (Table 2).

Table 2. Comparison of students' hygiene behaviors before and after the education (pre-test/post-test)

Student views	Pre-test		Post-test		Significance
	n	%	n	%	
Hand washing before the toilet					
Yes	97	(66.9)	115	(79.3)	$(\chi^2=18.933$, $p=0.001$)*
No	22	(15.2)	7	(4.8)	
Sometimes	26	(17.9)	23	(15.9)	
Hand washing after the toilet					
Yes	142	(97.9)	144	(99.3)	$(\chi^2=0.021$, $p>0.05$)
No	2	(1.4)	-		
Sometimes	1	(0.7)	1	(0.7)	
Drying the genital area					
Yes	79	(54.5)	111	(76.6)	$(\chi^2=17.792$, $p=0.001$)**
No	40	(27.6)	13	(9.0)	
Sometimes	26	(17.9)	21	(14.5)	
Type of underwear used					
Cotton	64	(44.1)	104	(71.7)	$(\chi^2=25.610$,
Combed Cotton	48	(33.1)	25	(17.2)	
Flannel	33	(22.8)	16	(11.0)	$p=0.000$ **
Bathing in the menstruation period^{a†}					
Yes	19	(51.4)	32	(86.5)	$(\chi^2=11.476$, $p=0.022$)*
No	10	(27.0)	3	(8.1)	
Sometimes	8	(21.6)	5	(5.4)	
Using deodorants in the menstruation period^{a†}					
Yes	20	(54.1)	26	(70.3)	$(\chi^2=8.566$, $p=0.073$)
No	4	(10.8)	2	(5.4)	
Sometimes	13	(35.1)	9	(24.3)	

*p<0.05 **p<0.001 df:4

^{a†}Two girls have not entered the menstruation period yet.

Discussion

The majority of the students washed their hands after entering the toilet, while nearly none of them washed their hands before use of the toilet.

In Turan and Ceylan's study (2007) of secondary school students, the rate of hand-washing before and after use of the toilet was found to be 69.8%; in Karatay and Özvarış' study of single/married women, the rate of washing hands before toilet use was low (0.08%), whereas the rate of washing hands after toilet use was 86.4%. Banda et al. (2007) reported that hand washing with soap after defecation and before meals was common only in children under 15 years of age (86.4%).

In Demirbağ's study (2000), it was reported that the rate of washing hands before the toilet was 68.2% in women with urinary tract disorders and 57.3% in the control group; no relationship was found between hand-washing and urinary tract disorders. At the same time, in Mazzola et al.'s study of girls aged 13-18 years, it was found that bad genital hygiene and toilet habits did not necessarily impact health. However, infrequent urination, insufficient liquid uptake and functional delaying of defecation may lead to urinary tract disorders. Adhikari et al. (2007) reported that girls did not perform adequate menstrual hygiene. Poor menstrual hygiene practices present a risk factor for genital tract infections as well as urinary tract infections, and health education on this topic is of great significance. In the present study, a significant increase was observed after the education on hand washing before entering the toilet. Similarly, the rate of hand washing after use of the toilet rose from 97.9% to 99.3% (Table 3).

The rate of drying the genital area after the toilet is not at the desired level, but the frequency of drying the perianal area after toilet use improved significantly (p<0.001). Karatay and Özvarış (2006) report the rate of drying the genital area as 66.4%, while Kocakaya (2005), in his study on high school students, found this rate to be 75.5% before the education and 80.5% after study participants were educated.

Bathing while standing is recommended because it is hygienic. In the study, no difference was found between girls and boys, while it was seen that girls' rate of bathing while standing (51.3%) was higher than that of boys. Turan and Ceylan (2007) reported the rate of bathing while standing as 56.8%. Kocakaya (2005) reported the rate of showering as 68.3% among high school students.

The majority of the students wore white cotton or combed cotton underwear, and no student was found to use synthetic underwear. In similar studies, Turan and Ceylan (2007) found the rate of cotton underwear use to be 93.5%, while Karatay and Özvarış (2006) found this rate to be 84.5% (Table 3).

In terms of having information on genital hygiene, the girls had more knowledge than boys. Adolescence is a problematic period in an individual's life; from time to time, the adolescent is unable to adapt to this change. Students must be educated about gender differences, physical maturity and personal hygiene, but they find it difficult to talk about these issues (Reproductive health issues among adolescents and youth, 2010).

In our study, the fact that the rate of receiving information was quite low might be attributed to the difficulty of transportation to the region and the acceptance of these issues as taboos, leading to avoidance of the topic during daily conversation.

With menarche, the menstrual blood content and vagenine present a risk for infections due to the associated flora and alkaline pH (Taşkın 2005). In addition, there persists a belief that bathing during the menstruation period is dangerous. Actually, the menstruation period is when the individual is at highest risk of infection. A significantly higher proportion of girls were found to bathe during menstruation after they had received health education.

This finding is considerably higher than that reported by Gler et al. (2005) or Turan and Ceylan (2007). In Unni's study (2009) of an Indian population, the proportion of students' who did not consider it healthy to bathe during the menstruation period was 30.5%, while in El-Gilany's study in Egypt, the proportion of students who bathed during menstruation was found to be high (70.9%).

Arıkan et al. (2004) found that 31.2% of high school students did not bathe during menstruation, but this rate decreased to 9.7% after the students received health-related education. The results suggest that health education had a positive effect.

More than half of the students surveyed use deodorants during the menstruation period. This rate was found to be higher than that reported by Arıkan et al. (2004) (78%). The deodorants are used to remove the bad odor created by dead intrauterine cells that are disposed of, along with

blood. At the same time, the bad odor can be prevented by cleaning and changing the pads frequently. Successful menstruation-related training programs were reported by Dongre, Deshmukh and Garg (2007). Arıkan et al. (2004) reported successful administration of health education related to use of the toilet and menstruation.

Conclusions

In conclusion, the education that was given induced positive behavioral changes in toilet and menstrual hygiene habits. To increase the success of the education, teachers and health officials must collaborate with parents and other family members, share information with them and educate the students who are away from their families through a comprehensive health program (Dasgupta & Sarkar 2008, Adhikari et al. 2007). Through this type of information-sharing, the use of models specific to the region is important to increase the utilization of reproductive health services by adolescents (The project of strategy development for meeting adolescents' reproductive health knowledge and service requirements, 2010). Health officials and nurses should be more sensitive to young people and plan trainings related to bathroom hygiene, to be provided in partnership with the school administration.

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