

Hijyen Eğitiminin Öğrencilerin Bilgi Düzeyine ve Okul Devamsızlığına Etkisi*

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Öz

Giriş: Hijyen enfeksiyonların gelişimini önlemede önemli bir unsurdur. **Amaç:** Bu araştırma, Bayraklı, İzmir’de ilköğretim okullarında verilen kapsamlı bir hijyen eğitiminin öğrencilerin bilgi düzeyine ve okul devamsızlığına etkisini değerlendirmek amacıyla yapılmıştır. **Yöntem:** Tek grup ön test-son test deseninde bir eğitim müdahalesi çalışmasıdır. Yapılan eğitimin bilgi düzeyine ve devamsızlığa etkisi incelenmiştir. Eğitim öncesi uygulanan ve 20 bilgi sorusu içeren ön-testin ardından, araştırmacılar Sağlık Bakanlığı tarafından hazırlanan hijyen eğitimi materyalini kullanarak 2010 bahar yarıyılında öğrencilere eğitim yapmışlardır. Üç ay sonra 584 öğrenciye son-test uygulanmış ve ön-testle karşılaştırılmıştır. Ayrıca öğrencilerin 2009 ve 2010 güz yarıyılı devamsızlıkları karşılaştırılmıştır. Verilerin analizinde ki-kare, McNemar ve bağımlı gruplarda t testleri kullanılmıştır. **Bulgular:** Öğrencilerin ortalama bilgi puanları anlamlı olarak yükselmiştir (pre-test: 7.59 ± 2.57 , post-test: 12.36 ± 2.38 , $p = .000$, her iki test de 20 üzerinden değerlendirilmiştir). Devamsızlık oranı 2009 güz yarıyılında %3.18 günden (%95 GA 3.03-3.34) 2010 güz yarıyılında %2.83 güne (%95 CI 2.69-2.98) düşmüştür ve %11 azalmıştır. Eğitim öncesinde ortalama bilgi puanları, öğrencilerin yaş, sosyal güvence ve aile tipine göre anlamlı farklılık gösterirken eğitim sonrası puanlar, bu etmenlerden bağımsızdır ve eğitimin öğrenciler arasındaki bilgi eşitsizliklerini azalttığını göstermektedir. **Sonuç:** Eğitimin öğrencilerin bilgi düzeyleri ve devamsızlıkları üzerinde önemli etkisi olmuştur. Bu değişimler, yapılandırılmış bir eğitim müdahalesinin, okul ortamında bulaşıcı hastalıkları kontrol etmeye yönelik etkili bir ilk adım olabileceğini düşündürmektedir.

Anahtar Sözcükler: Okul Sağlığı, Eğitim, Öğrenci, Devamsızlık, Enfeksiyon Kontrolü.

Abstract

The Impact of Hygiene Training on Students’ Level of Knowledge and School Absenteeism

Background: Hygiene is a key element in preventing the development of infections. **Objectives:** This study aimed to evaluate the effects of a comprehensive hygiene training program on students’ level of knowledge and absenteeism among primary schools in Bayraklı, Izmir. **Methods:** This study involves an educational intervention in the form of a one-group pretest-posttest design. The impact of the training was evaluated by comparing level of knowledge and absenteeism. Following a pre-test including 20 knowledge questions on hygiene, researchers conducted hygiene instruction using an education toolkit prepared by the Ministry of Health. A post-test was given to 584 students three months post-instruction. Chi-square, McNemar’s and dependent samples t tests were used to analyse the data. **Results:** Students’ mean knowledge scores significantly increased (pre-test: 7.59 ± 2.57 , post-test: 12.36 ± 2.38 , $p = .001$). Absenteeism rate per 100 student-days decreased significantly from 3.18 (95% CI 3.03-3.34) in the Fall 2009 semester to 2.83 (95% CI 2.69-2.98) in the Fall 2010 semester and this decrease corresponded to a 11.0% reduction in absenteeism. Before the training, students’ mean scores on hygiene significantly differed according to their age, social security and family type, while post-test scores were independent of these determinants. **Conclusion:** The training had a significant impact on students’ level of knowledge and absenteeism. These changes suggest that a structured educational intervention can be an effective first step in a controlling communicable disease in the school setting.

Key Words: School Health, Training, Student, Absenteeism, Infection Control.

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Primary school students (children aged 7-14 years) comprise approximately 15% of Turkey’s population. Children acquire their basic health behaviors during their school period during a period of rapid growth and development (Ministry of Education, 2010). School health services are considered as a part of primary care services, and as one of its components, personal hygiene habits should be covered as part of the health education programs for children. Hygiene is defined as all precautions and sanitary rules performed to preserve health. Basic hygiene refers to practices that help maintain health and prevent the spread of diseases (Oyibo, 2012).

Personal hygiene includes hair washing and care, face, eye and ear cleaning, oral health care, foot sanitation, bathing of the body, cleaning hands and nails, and wearing appropriate, clean clothing (Ministry of Health and UNICEF, 2002). Many diseases can be prevented through the improvement of the community’s level of personal hygiene via hygiene education (Aylaz, Gunes, Pehlivan and Karaoglu, 2011; Greene, 2001). Disease prevention has the potential to reduce absenteeism among school-aged children. As hands are important vehicles of communicable disease transmission among school-aged children, both hand washing and hand sanitizer interventions have been demonstrated to be effective measures in decreasing illness-related absence (Lau et al., 2012).

Children’s personal hygiene practices have direct consequences on their health. Improper hand hygiene among students has been linked to outbreaks of upper respiratory illness, group B Streptococcus colonization, and Norwalk-like virus gastroenteritis (Anderson, 2008). It has been shown that infectious diseases cause significant absenteeism among North American primary school children (Meadows and Le Saux, 2004). Disease-related absenteeism has significant negative impacts both educationally and economically (Lau et al., 2012). The higher burden of communicable diseases in developing countries is attributed to poor hygiene and insufficient sanitation (Yılmaz and Özkan, 2009). Some sociodemographic characteristics such as gender and ethnicity have also been shown to be determinants of hygiene behavior (Anderson, 2008). Primary school can be crucial period in developing personal hygiene habits, since behavioral change is more easily established in these younger ages.

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Children can add health knowledge that they acquire in school to the hygiene habits they have acquired from their parents as they start develop healthy behaviors over time (Aslan et al., 2006; Çan, Topbaş and Kapucu, 2004; Çetinkaya et al., 2005). School-based hand washing interventions have been proven to be efficient in reducing the transmission of both air-borne diseases like influenza and other communicable diseases, and decreasing absenteeism due to illness, but the role of instruction and the feasibility and acceptability of such training programs are not clear (Lau et al., 2012; Schmidt, Wloch, Biran, Curtis and Mangtani, 2009). The aim of this study was to evaluate the effects of a comprehensive personal hygiene training program on students' level of knowledge and absenteeism among primary schools in Bayraklı, İzmir and to explore whether such training minimized the effects of social determinants on students' level of knowledge. A secondary aim was to evaluate the relationship between socio-demographic characteristics and level of knowledge.

Method

Type

A one-group pre-test/post-test design was used to examine the impact of hygiene education on knowledge and school absenteeism was compared before and after the training.

Variables

The independent variables of the study were the change in students' level of knowledge and their absenteeism. The independent variables of the study were socio-demographic characteristics (gender, age, family type, level of income, mother's and father's education and employment status, presence of siblings, health security), students' previous training on hygiene.

Sample

The educational intervention was carried out between February and June 2010 among fifth grade children in the Bayraklı district of Izmir province, Turkey. The population of the metropolitan city is 3.623.540. Bayraklı is one of its larger districts with 309.137 population (TSI, 2012) and contains suburban areas receiving migration from the less-developed east part of the country. There are 40 primary schools in Bayraklı, with a total of 4126 fifth grade students. These schools were stratified according to their sub-districts' socioeconomic level as reported in municipal records. Eight primary schools were chosen with the guidance of the municipality as representative of the district; four from upper and four from lower socio-economic level. One of the upper socio-economic schools refused to participate in the study. All 735 fifth grade students in the remaining seven schools were the target population for this study.

Intervention

The educational intervention consisted of a presentation on comprehensive personal hygiene and the use of an educational toolkit prepared by the Ministry of Health and recommended for use in schools by the Ministry of Health's Community Health Centres. The hygiene presentation was developed by the authors after consultation with teachers, school officials, and local leaders. The toolkit contained a printed brochure and a video on correct handwashing technique. This toolkit was not yet in use in Bayraklı district. After the 45 minute long hygiene presentation, a 10-minute video on hand-washing was shown and the Ministry of Health's leaflet on hygiene was distributed. The topics covered included hand washing (when to wash, how to dry), nail care (hand and foot), frequency of face and feet washing, frequency of bathing, how to take a bath, wearing clean clothes and the frequency of changing clothes, hygiene after the toilet, the importance of oral health, timing and duration of brushing the teeth, frequency of changing the toothbrush, frequency of dentist visits. The educational sessions were run by the researchers and by 10 health administration students, as part of their school health practical training. To ensure the integrity of the intervention, students who assisted in the study received training and had the opportunity to pilot the intervention and the data collection tool prior to actual implementation.

A questionnaire was developed by the researchers. The first part of the questionnaire included 12 questions on socio-demographic characteristics of the students, and the second section contained 20 multiple-choice questions on evidence-based hygiene knowledge. The pre-test questionnaires were distributed to students immediately prior the educational intervention. The post-test questionnaires were administered to the students three months post-intervention. The questionnaires and presentations were conducted during class hours selected by the school administration. The school children were asked to provide nick names on their questionnaires so that pre- and post-tests could be linked.

The intervention was conducted between 15 February-16 March 2010, according to the available dates and class hours of the participating schools. The fifth grade students present on that day were enrolled in the pre-test and training (n = 621; 84.5%). After three months, the same schools were contacted and appointments were taken for the post-test between 17 and 29 June 2010. The same questionnaire was distributed to the 584 students present three months later (Snow, White & Kim, 2008). This resulted in 94.0% coverage of the students completing the pre-test and 79.5% coverage of the 735 students comprising the target group.

Measures

Students' knowledge scores were calculated by giving "1" point for each correct answer and "0" point for each wrong or blank answer and summing the points. The total knowledge scores of seven students who had left more than 10 questions blank were not calculated. The maximum possible score was 20. Students' change in pre- and post-test scores was calculated as (post-test score) – (pre-test scores).

Student absenteeism data for the semesters before and after the education were obtained from Bayraklı District Education Directorate as total days absent during the relevant semesters. Fall 2009 semester had a total of 83 possible days of attendance while Fall 2010 semester had 88 days. Absenteeism rate per 100 student-days was calculated by dividing the total number of absent days by the total number of students multiplied by the possible days of attendance. Percent relative effect was calculated as $(1 - \text{posttest rate} / \text{pretest rate}) * 100$ (Meadows and Le Saux, 2004).

Ethical considerations

Interviewers explained the purposes and procedures of the study to the subjects. The subjects were informed that they had the right to refuse to participate in the study at any time. Subjects were also informed that data which would be obtained would be confidential. An approval of the ethical committee of Ege University Izmir Ataturk School of Health. Also written permission to conduct this study was obtained from the National Education Directorate and Bayraklı Municipality.

Data Analysis

Data were entered and means, standard deviations, frequency distributions were calculated as descriptive statistics. Chi-square test was used to compare categorical variables and $p < .05$ was selected as the standard for statistical significance. McNemar's test was used to compare each item's pre- and post-test results, and the students' total pre- and post-test scores were compared with paired samples t test. The relationships between socio-demographic characteristics and pre- and post-test scores were evaluated using Student's t and Kruskal-Wallis tests. Students' mean absenteeism days across both semesters were compared using the paired samples t-test. Spearman's correlation analysis was performed to explore whether an increase in scores was related to a decrease in absenteeism.

Results

The mean age of the 584 participating students was 11.2 ± 0.5 (min.10-max.13 years). Socio-demographic characteristics of the participating students are shown in Table 1. Among their mothers, 18.6% were working while 85.1% of the fathers were employed. Among the students, most (89.2%) had siblings and more than half (55.5%) had already received training on hygiene.

Table 1. Some Socio-Demographic Characteristics of the Participating Students (n = 584)

Socio-demographic characteristics	Number	percentage
Gender		
Boy	313	53.6
Girl	271	46.4
Age (years)		
10	16	2.7
11	435	74.5
12	124	21.2
13	9	1.5
Family type		
Nuclear	467	80.0
Extended	106	18.2
Single-parent	11	1.9
Level of income		
Poor	49	8.4
Medium	314	53.8
Good	221	37.8
Mother's education		
Illiterate	83	14.2
Literate	81	13.9
Primary school	286	49.0
Middle school	71	12.2
High school	55	9.4
University	8	1.4
Father's education		
Illiterate	23	3.9
Literate	83	14.2
Primary school	224	38.4
Middle school	151	25.9
High school	80	13.7
University	23	3.9

Among knowledge questions, those with the highest correct answer rates were 'Hands should be washed before meals' (83.0%), 'Hands should be washed after the toilet' (81.2%), and 'How often should the feet be washed?' (80.7%).

Table 2. Correct Answer Rates to the 20 Knowledge Questions (n = 584)

Question or statement	Pretest	Posttest	p
1. Hands should be washed before leaving the house	33 (5.7)	122 (20.9)	.000
2. Hands should be washed upon returning home	301 (51.5)	364 (62.3)	.000
3. Hands should be washed before entering the toilet	10 (1.7)	194 (33.2)	.000
4. Hands should be washed after toilet	371 (63.5)	474 (81.2)	.000
5. Hands should be washed before eating meals	346 (59.2)	485 (83.0)	.000
6. Does washing the hands without soap clear away the microbes on hands?	277 (47.4)	422 (72.3)	.000
7. What should be used to dry hands?	233 (39.9)	262 (44.9)	.026
8. What do you think of sharing towels?	337 (57.7)	431 (73.8)	.000
9. How often should the face be washed?	165 (28.3)	229 (39.2)	.000
10. How often should the feet be washed?	264 (45.2)	471 (80.7)	.000
11. How often should the hand and foot nails be cut?	227 (38.9)	376 (64.4)	.000
12. How often should one take a bath?	332 (56.8)	405 (69.3)	.000
13. How should one take a bath?	182 (31.2)	470 (80.5)	.000
14. How often should underwear be changed?	141 (24.4)	417 (71.4)	.000
15. How often should sockets be changed?	308 (52.7)	462 (79.1)	.000
16. How should be the cleaning after the toilet?	204 (34.9)	432 (74.0)	.000
17. How often should one change his/her toothbrush?	214 (36.6)	271 (46.4)	.000
18. When should the teeth be brushed?	166 (28.4)	225 (38.5)	.018
19. How long should be the duration of tooth brushing?	195 (33.4)	289 (49.5)	.000
20. How often should one have dentist visits?	184 (31.5)	417 (71.4)	.000

Table 3. Mean Pre- and Post-Test Knowledge Scores According to Socio-demographic Characteristics (n = 584)

Sociodemographic characteristics	Categories of the variable	Pre-test score	Test statistics and p	Post test score	Test statistics and p
Age	10-11	7.7 ± 2.6	t = 2.980	12.5 ± 2.4	t = 1.859
	12-13	7.0 ± 2.5	P = .003	12.0 ± 2.4	p = .064
Gender	Girl	8.0 ± 2.4	t = 3.693	12.7 ± 2.4	t = 3.211
	Boy	7.2 ± 2.6	P = .001	12.1 ± 2.6	P = .000
Highest educational attainment of parents	University	7.8 ± 3.4	t = 0.459	12.3 ± 2.6	t = -.062
	Other	7.6 ± 2.5	p = .646	12.4 ± 2.4	p = .951
Mother's education	Illiterate/literate	7.1 ± 2.5	K-W X ² = 12.977	11.9 ± 2.5	K-W X ² = 8.001
	Primary/middle	7.9 ± 2.5	p = .002	12.6 ± 2.4	p = .018
	High/university	7.4 ± 2.9		12.2 ± 2.0	
Father's education	Illiterate/literate	6.7 ± 2.3	K-W X ² = 16.964	11.7 ± 2.4	K-W X ² = 10.064
	Primary/middle	7.8 ± 2.5	p = .001	12.5 ± 2.4	p = .007
	High/university	7.8 ± 2.9		12.4 ± 2.3	
Mother's occupation	Not working	7.6 ± 2.6	t = 0.786	12.4 ± 2.4	t = 0.448
	Working	7.4 ± 2.5	p = .432	12.2 ± 2.4	p = .655
Father's occupation	Not working	7.3 ± 2.6	t = -.988	12.2 ± 2.2	t = -.647
	Working	7.6 ± 2.6	p = .324	12.4 ± 2.4	p = .518
Level of income	Poor	7.3 ± 2.3	K-W X ² = 5.574	12.0 ± 2.1	K-W X ² = 3.487
	Medium	7.8 ± 2.6	p = .062	12.5 ± 2.3	p = .175
	Good	7.3 ± 2.6		12.2 ± 2.5	
Social/health security	Yes	7.7 ± 2.6	t = 2.137	12.4 ± 2.4	t = 0.466
	No	7.2 ± 2.5	p = .033	12.3 ± 2.3	p = .641
Family type	Nuclear	7.7 ± 0.1	K-W X ² = 8.572	12.4 ± 2.4	K-W X ² = 0.724
	Extended	7.2 ± 2.7	p = .014	12.2 ± 2.2	p = .696
	Single-parent	6.3 ± 3.3		12.0 ± 3.0	
Siblings	Yes	7.7 ± 2.6	t = -1.934	12.4 ± 2.4	t = -0.540
	No	7.0 ± 2.7	p = .054	12.2 ± 2.6	p = .590
Previous education on hygiene	Yes	7.9 ± 2.5	t = 3.031	12.6 ± 2.3	t = 2.189
	No	7.2 ± 2.6	p = .003	12.1 ± 2.4	p = .029

Those questions with the lowest correct answer rates were 'Hands should be washed before leaving the house' (20.9%), 'Hands should be washed before entering the toilet' (33.2%) and 'How often should the face be washed?' (39.2%). The knowledge questions and the students' correct answer rates pre- and post-intervention are shown in Table 2.

There was a significant increase in the mean knowledge scores from 7.59 ± 2.57 at pre-test to 12.36 ± 2.38 at post-test ($p = .000$). The mean scores of children who had stated that they had no prior training on hygiene had increased from 7.23 ± 2.62 to 12.12 ± 2.41 ($p = .001$). The mean scores of children who had stated that they had previously received training on hygiene had also significantly increased, from 7.88 ± 2.50 to 12.55 ± 2.35 ($p = .000$) (Table 2). The effects of socio-demographic characteristics on pre-test and post-test scores are explored in Table 3. Among the factors that had a significant impact on pre-test scores, the effects of age, social security, family type, level of income and presence of siblings (the latter two approached the level of significance) disappeared at post-test, the post-test scores becoming independent of these determinants. However, gender, mother's and father's education, and previous education on hygiene still had significant impacts on post-test scores.

There was a decrease in mean absenteeism from 2.64 ± 2.62 in Fall 2009 semester to 2.49 ± 1.64 at post-test in Fall 2010, approaching significance ($p = .074$). Higher decrease in absenteeism was correlated with higher increase in knowledge scores ($r = .321$ and $p = .001$). Absenteeism rate per 100 student-days decreased significantly from 3.18 (95% CI 3.03-3.34) in the Fall 2009 semester to 2.83 (95% CI 2.69-2.98) in the Fall 2010 semester and this decrease corresponded to a 11.0% relative effect.

Discussion

The scientific evidence for hygiene-focused research is quite varied. Some studies focus on increase in knowledge while others evaluate changes in attitude, behavior, or other measurable outcomes like absenteeism. This intervention, limited to an educational intervention, enabled a significant 11% reduction in absenteeism rates.

While the intervention was found to effectively increase mean knowledge scores by 28% to the level of 62%, the adequacy of the top score of 12.36 out of 20 (62%) can be questioned. It is reasonable to expect that children will not remember all of the content presented in a single training session, especially after a time lag of three months. The results of another study from Turkey documented an increase in knowledge from 68 to 75%. The differences may be attributable to the use of a different questionnaire and the inclusion of older children. In a study among Peruvian schools, fifth graders' knowledge about helminth infections increased approximately 50 percent (Gyorkos, Maheu-Giroux, Blouin and Casapia, 2013). The smaller amount of change measured in our study might be attributed to higher pre-test scores compared to the Peruvian intervention as a result of the more general nature of the information included in this intervention. The post-test scores are comparable even though the Peruvian intervention was much more intense, comprising 30-minute refresher activities every two weeks over four months after the initial one hour training (Gyorkos et al., 2013).

Among single items, the two statements having highest correct response rates were "Hands should be washed before eating meals" (83%) and "Hands should be washed after toilet" (81%); these results were similar to those of other studies (Çan et al., 2004; Çetinkaya et al., 2005; Kaya and Aslan, 2009; Steiner-Asiedu et al., 2011; Şimşek et al., 2010; Vivas et al., 2010). Both of these items are critical in the control of microorganisms using the fecal-oral route (Çan et al., 2004; Ministry of Health and UNICEF, 2002). Other items related to hand-washing like before leaving the house and before entering the toilet had very low correct answer rates even at post-test (21% and 33%, respectively) and shows that further emphasis is required for these timings (Aslan et al., 2006; Çan et al., 2004).

Older fifth graders' significantly lower score at pre-test might be considered as an unexpected finding, since an increase in level of knowledge with increasing age could be expected. This may be attributed to more disadvantaged students either starting later to school or repeating a grade. The disappearance of this significant difference at post-test is a positive finding, showing that these students' level of knowledge has caught-up to that of their peers.

Data analysis revealed that between- group differences in knowledge that were significant prior to intervention are no longer significant post intervention. In Turkey, lack of social security can be considered as an indicator of the lowest social class and knowledge differences between groups with or without social security disappeared after training. Children living in nuclear families had the highest pre-test scores, followed by children living in extended families and then by children living with only one of their parents. Another study from Turkey has also found better hygiene among children living in nuclear families (Çan et al., 2004). Evidence about parental stability's effect on hygiene knowledge is lacking, however, single parents' children might be more neglected or receive less attention than children receiving attention from both parents (Alm, Wendt, Koch and Birkhed, 2007). This training has also positively overcome the impact of family type on children's knowledge level.

Children from medium income families and children having siblings had somewhat higher pre-test scores than others, approaching statistical significance. Low and high income families' children might be receiving less attention from their families. Findings of a Turkish study documented poorer hygiene among children studying at a high socio-economic class school with the researchers postulating that working mothers have less opportunity to teach their children (Çetinkaya et al., 2005). Another study also confirms that level of income is an important factor on children's hygiene knowledge (Önsüz and Hıdıroğlu, 2008). As for the presence of siblings, this might be increasing the opportunities of hygiene training at home or their sibling might be serving as a role-model. These almost significant differences had also favorably disappeared after the training, homogenizing the students' knowledge level in terms of these contributing factors.

In many aspects of health, parents' higher education, and especially mother's higher education significantly increases children's personal hygiene knowledge and improves behavior (Çan et al., 2004; Kaya and Aslan, 2009; Kaya et al., 2006; Köse, Güven, Mert, Eraslan and Esen, 2010; Önsüz and Hıdıroğlu, 2008). This pattern held true in this study; differences in mean scores both pre- and post-intervention were significantly associated with level of maternal education. Mothers with less education probably are less well-informed about hygiene and thus cannot educate their children as well as mothers with better

education. In addition, and they may not be good role-models, as observed in a study where mothers' and fathers' tooth brushing behaviors had an effect on their children's behavior (Efe, Sarvan and Kukulu, 2007). Actually, children learn more from what they observe than from what they hear about. The attitude of the child's parents is of great importance in achieving risk factor changes (Guzmán-Armstrong, 2005). Teachers' and principals' acting as role models could have a significant impact especially for these children who have observed incorrect attitudes from their parents (Nandrup-Bus, 2009).

Girls had a better level of knowledge both at pre- and post-test, and the training did not alter this gender difference. Another observational study has found better hand hygiene in female students (Anderson et al., 2008) and interventional studies on oral health have also found greater improvement in gingival health among girls as compared to boys (Saied, Moallemi, Virtanen, Vehkalahti, Tehranchi and Murtomaa, 2009). This gender difference was previously explained as girls' tendency to practice socially acceptable behaviors (Johnson, Sholcosky, Gabello, Ragni, Ogonosky, 2003), but it is possible that gender roles as defined in Turkish culture are also important.

As in other studies evaluating absenteeism as an outcome (Meadows and Le Saux, 2004; Nandrup-Bus, 2009). This study found a significant reduction in students' absenteeism. The 11% reduction in the absenteeism rate per 100 student-days reported here was lower than the rate of reduction of absenteeism reported in a study of the use of antimicrobial hand sanitizers (Meadows and Le Saux, 2004). This contrast could be an expected finding due to the differences between interventions.

Previous training on hygiene also had a significant impact on post-test scores, which implies that formal training is an important factor increasing students' level of knowledge. However, the post-test scores of children who were already trained had also increased significantly, showing that repetitions of such trainings and their inclusion in the school's program are important.

Conclusion

The hygiene training program implemented at the primary schools in Izmir showed that a comprehensive training accompanied by a leaflet had a significant impact on students' level of knowledge. The reduction in absenteeism suggests that this increase in information could have beneficial impact on behavior. This effective, practical and standard training should be delivered in all schools, Nurses in the Ministry of Health's community health centres, which are already responsible of school health issues, are the most likely health professionals to coordinate this effort.

It is interesting to note that the training reduced the impact of some socio-demographic characteristics on the mean scores. Statistically significant differences in the mean post-test scores remained for gender, mother's and father's education, and previous education on hygiene. These findings suggest that education might need to be provided to parents and that perhaps young men should receive additional reinforcement of this information.

Limitation

A limitation of this study is that it focuses on knowledge gain but does not evaluate attitude or behavior, both of which are known to influence behavior. In addition, it is possible that the selected schools might be more co-operative or more receptive to such training than other schools. The measurement of the level of income, showing the perceived income by the students, might not clearly represent real income differences. Finally, the use of illness-related absenteeism rather than general absenteeism rates would have been preferable.

This study has documented an increase in comprehensive hygiene knowledge that persisted for three months post intervention and a decrease in school absenteeism. In addition, the results indicate that hygiene education reduces some differences in knowledge that result from social risk factors.

Implication for School Nursing Practice

The continuation of this beneficial, effective and practical training, which also reduced knowledge inequalities among students, is recommended. This training might be integrated to the routine school health services provided by Community Health Centers in Turkey. Nurses of these centers can give this training systematically to all the schools in their catchment area. Special methods could be developed for boys, to reduce gender differences.

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Kaynaklar

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