Personal Hygiene Status among Primary School Students in an Urban Area in the west of Turkey

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ABSTRACT

Objective: This study was designed to determine the personal hygiene status in primary school students by using a scale that can be used in routine practice**.**

Methods: Cross-sectional descriptive study conducted in Kutahya,Turkey.Three primary schools in the city center were randomly selected for the study sample. The study was conducted among 1521 students between Dec 13 and Dec 31, 2013. Students were informed about the nature of the research and only consenting students were given the questionnaires. The questionnaire form included the information on the sociodemographic characteristics and includes the questions about the personal hygiene habits. Participants were asked to complete the "Personal Hygiene Status Scale (PHSS)".

Results: Personal hygiene was considered to be inadequate for students with a score of 81.5 or under on the scale. Of the students, 27.7% had an inadequate personal hygiene. The number of students with poor hygiene increased with the decreasing maternal education level and household income level, the frequency of having poor hygiene was higher among male students and in those with a patriarchal family type. The personal hygiene status was not correlated with parental age, student age group and paternal education level.

Conclusion: This study may guide to the future studies on school health with suggesting that PHSS may be used as a reliable and valid scale which can be used easily.

Key words: Student, Personal hygiene, Scale

INTRODUCTION

All the applications for being protected from environmental conditions and potentially hazardous environments for human health and the cleaning measures are defined as hygiene. Personal hygiene can include a wide range of hygiene measures from hand and nail cleaning to the whole-body cleaning and even to the items used for this purpose (1).

Throughout the world, 2.6 billion people are estimated to lack from the hygiene measures, with a high rate of infectious diseases due to the poor environmental conditions particularly in undeveloped and developing countries. Moreover, improved personal hygiene is known to be effective in preventing the transmission of many diseases (1,2).

The translation of personal hygiene rules into the behavioral changes may be difficult with the advancing age. The teaching for gaining this behavior to the children begins in the family and continues in the school which represents their first social environment (1,3). Because students are in a close contact with others in the classrooms and during other activities, the transmission of diseases is facilitated and potentially, the infectious pathogens are transported from school to the home. This makes the necessity of personal cleaning and hygiene important. The hygiene behavior gained during childhood will directly affect the health of the individual in adulthood (4-6).

In our country, the rate of infectious disease is known to be high among children with a poor socioeconomic status and in regions with poor hygiene conditions. On the other hand, the parasitic diseases, throat infections and tooth decay in school-aged children have been suggested to be associated with the inadequate personal hygiene measures (7-10). In addition,

it is a significant problem to measure the hygiene behavior in people. Some studies have reported that frequency of hygiene behavior can be measured by direct observation, self-report, disease rate or frequency of use of cleaning equipment (11-13).

This study was designed to determine the personal hygiene status in primary school students by using a scale that can be used in routine practice.

MATERIALS AND METHODS

The study was conducted in the province of Kutahya which has a total population of 237 602, with 48 317 are being under the age of 15 years. In the central district of Kutahya, there are a total of 27 627 primary school students.

Three primary schools in the city center were randomly selected for the study sample. After obtaining the permission of the provincial Directorate of National Education, the administrators of each school were visited. This cross-sectional study was conducted between Dec 13 and Dec 31, 2013. The students available in the classrooms were informed about the study and were asked to fill out the distributed pre-prepared questionnaire forms under the supervision of their parents. The questionnaire forms were collected in the classroom in the next day. All stages of the study were carried to in accordance with the Declaration of Helsinki. In the randomly selected schools, there were a total of 2145 students (1st to 8th class), with 1521 of them (71%) agreeing to participate in the study.

The questionnaire form consists of 3 sections. The first section included the information on the age and gender of the students, while the second section includes maternal and/or paternal sociodemographic characteristics and the third section includes the questions about the personal hygiene habits, the "Personal Hygiene Status Scale (PHSS)". The PHSS prepared by using multiple previous reports in the literature (6,11-13) examines a total of 19 hygiene behaviors (Table 1), including hand washing in a variety of situations, nail cutting, tooth brushing, bathing, changing the underwear and using wet wipes. The rating for the questionnaire items was done by using 5-point Likert scale, with 1 point for "never", 2 points for "rarely", 3 points for "sometimes", 4 points for "mostly", and 5 points for "always". The possible minimum and maximum total scores are 19 and 95, respectively. In order to determine the cut-off point for the scale, the scores were divided into two sets by using Means Cluster analysis, followed by the Roc analysis performed with reference to these

cluster characteristics (14). The individuals with a point of 81.5 or over were considered to have an adequate personal hygiene.

Statistical analysis: Data were analyzed by using SPSS Statistical Package program (version 20.0). The chi-square and t-tests and Pearson correlation and reliability analyses (Cronbach alpha, factor analysis) were used to analyze the data. Statistical significance was set at p<0.05.

RESULTS

The study was carried out on a total of 1521 students consisting 775 male (51%) and 146 female (%49) students. The mean age was 9.91±2.38 years (range, 6-14 years). Of the students, 57% (n=868) were studying at classes 1-4 and 43% (n=653) were studying at classes 5-8.

Reliability and validity

The construction-concept validity of the scale evaluated by factor analysis, the Kaiser-Meyer-Olkin (KMO) coefficient of 0.905 and Bartlett test results were found to be significant (X^2=6167.32; p=0.000).

While Cronbach alpha value for PHSS was 0.845, the item-total correlations ranged between 0.322 and 0.564, the scale alpha value ranged from 0.830 to 0.847 when the item was removed and the factor loading ranged between 0.306 and 0.650 (Table 1).

The average scores for the top and bottom of the group were compared in order to test the internal criterion validity. The scores were ranked from highest to lowest. The difference between the average scores of 25% bottom and 25% top of the group was statistically significant (t=59.62; p=0.000).

The correlation of test-retest scores were used in order to test the invariance of the scale with respect to time. The test was repeated on 100 students 15 days after the first implementation of the scale. There was a positive correlation between the data obtained from the two implementations (Pearson r=0.871; p=0.000).

PHSS Assessment

The average score on PHSS was 84.83±8.06 (min: 38, max: 95) and the ROC analysis revealed a cut-off point of 81.5 with 96% sensitivity and 70% specificity (ROC under curve-

AUC: 0.948, p: 0.000). Personal hygiene was considered to be inadequate for students with a score of 81.5 or under on the scale.

Table 1. Results of Reliability Analysis

|	Factor loading	Scale mean if item is removed	Item-total correlation	Cronbach's alpha if item is removed
1.Washing hands only with water	,650	80,34	,343	,847
2.Washing hands with soap and water	,649	80,21	,488	,836
3. Washing hands before the meals	,629	80,47	,529	,833
4. Washing hands after the meals	,628	80,25	,525	,834
5. Washing hands after using the toilet	,621	79,96	,403	,841
6. Washing hands in the morning	,618	80,19	,376	,840
7.Washing hands after contact with animals	,602	80,17	,367	,840
8.Drying hands after the washing	,572	80,23	,365	,840
9.Washing hands when coming home	,528	80,45	,532	,833
10.washing or cleansing hands after sneezing	,306	80,67	,564	,831
11. Using toilet paper after using the toilet	,514	80,07	,356	,844
12.Cleansing with water after using the toilet	,482	80,23	,357	,841
13.Brushing teeth at least two times everyday	,462	81,17	,546	,832
14.Bathing at least two times in a week	,456	80,59	,453	,837
15.Cutting the fingernails once a week	,444	80,20	,322	,842
16. Daily changing the underwear	,442	80,75	,527	,833
17.Daily changing the socks	,390	80,34	,443	,837
18.Washing feet everyday	,426	80,87	,571	,830
19. Use of wet wipes in case of having no water and soap	,307	80,27	,384	,840

Of the students, 27.7% had an inadequate personal hygiene. The number of students with poor hygiene increased with the decreasing maternal education level and household income level, the frequency of having poor hygiene was higher among male students and in those with a patriarchal family type. The personal hygiene status was not correlated with parental age, student age group and paternal education level (Table 2).

Table 2. The distribution of the personal hygiene status of the students by some features

| | Personal Hygiene Status | | | |
	Inadequate n (%)*	Adequate n (%)*	Total**	X^2; p
Gender				
Male	235 (30,4)	539 (69,6)	774 (51,0)	5,38; **0,020**
Female	187 (25,0)	560 (75,0)	747 (49,0)	
Age groups				
6-9	222 (29,0)	544 (71,0)	766 (50,3)	1,63; 0,440
10-12	113 (25,6)	329 (74,4)	442 (29,1)	
≥13	87 (27,8)	226 (72,2)	313 (20,6)	
Maternal age				
≤30	94 (28,6)	235(71,4)	329 (21,6)	4,39; 0,111
30-40	238 (26,2)	671 (73,8)	909 (59,8)	
>40	92 (32,5)	191 (67,5)	283 (18,6)	
Maternal education				
Primary	300 (29,7)	711 (70,3)	1011 (66,5)	5,98; **0,05**
Secondary	83 (24,8)	252 (75,2)	335 (22,0)	
High school	39 (22,3)	136 (77,7)	175 (11,5)	
Paternal age				
≤35	99 (27,9)	256 (72,1)	355 (23,3)	0,174; 0,917
35-45	178 (27,4)	472 (72,6)	650 (42,7)	
>45	147 (28,5)	369 (71,5)	516 (34,0)	
Paternal education				
Primary	161 (28,0)	415 (72,0)	576 (37,9)	3,37; 0,185
Secondary	187 (29,7)	442 (70,3)	629 (41,3)	
High school	76 (24,1)	240 (75,9)	316 (20,8)	
Families -type				
Nuclear	247 (25,4)	725 (74,6)	972 (63,9)	7,31; **0,007**
Large	175 (31,9)	374 (68,1)	549 (36,1)	
Household income level				
≤1000TL	148 (33,2)	298 (66,8)	446 (29,3)	12,97; **0,002**
1000-2000TL	88 (29,7)	208 (70,3)	296 (19,5)	
≥2000TL	186 (23,9)	593 (76,1)	779 (51,2)	

The frequency of behavior was determined by considering the answers of "often" and "always" to each of the 19 statements in the scale. Of the students, 58.4% reported that

they are brushing their teeth at least two times in a day and 94.2% have reported that they are washing their hands after using the toilet, while the frequency of other behaviors was between these two percent values (Figure 1).
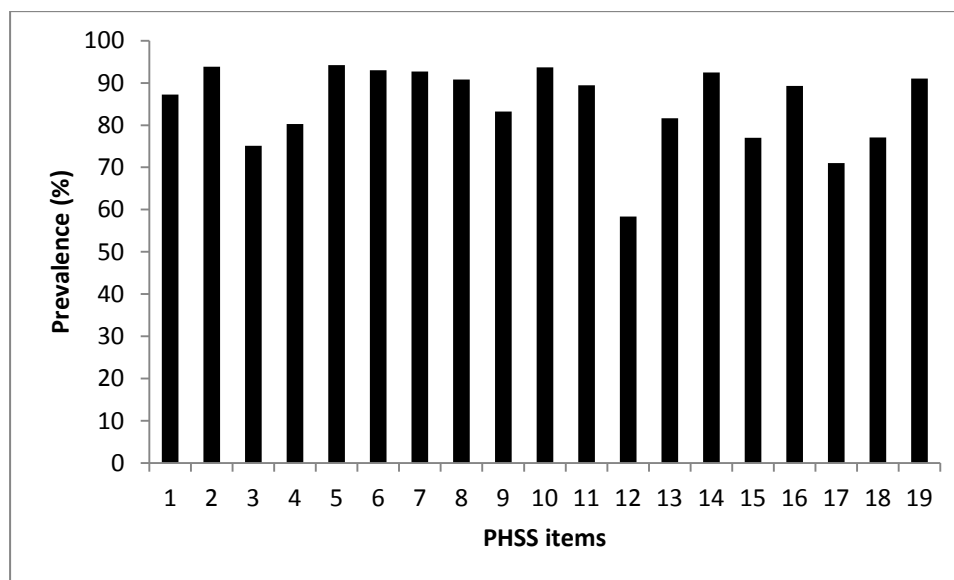
Figure 1. The percentage of use of behaviors included in PHSS.

DISCUSSION

Determination of the hygiene status in school-age children is an important step for the programs for development of school health. Most studies carried out in our country have evaluated the general hygiene behaviors in school-age children, but did not used a standard scale for personal hygiene status (5,6,15-17). In our study, a scale was developed to determine the personal hygiene behaviors. Because washing hands is one of the first priority and basic behaviors for the hygiene, 10 items in the scale assesses this hygiene behavior. On the other hand, because brushing teeth, having bath and changing the underwear should be done regularly and consistently, it has been also questioned that whether these hygiene behaviors are done in a frequency similar to that in our society.

Among the 19 behaviors assessed by the scale, the least and most commonly done behavior were "brushing teeth at least two times in a day" and "washing hands after using the

toilet". Of the students, 94.2% reported that they are washing their hands with soap after using the toilet and 75.1% reported that they are washing their hands soap before the meals. Washing hands is a simple hygiene behavior with being important in preventing the diseases transmitted by water and foods (18). In studies from our countries, the frequency of washing hands both before and after the meals ranges from 60% to 96% in children (15-17). On the other hand, in a study conducted in 25 schools in Colombia, it has been reported that 33.6% of the students wash their hands with soap before the meals and after using the toilet with these two hygiene behaviors are being appropriate hand washing behaviors (19).

In African school studies, the suboptimal hygiene behaviors were defined as washing hands before the meals (62.2%) and after using the toilet (58.4%) and brushing the teeth (77.3%). However, when the frequency of washing hands with soap was assessed, these percentages have decreased to 35% (20).

Dental caries and diseases are major health problems that are in high frequency particularly in children. Poor oral hygiene may cause dental caries as well as precipitate for development of some systemic diseases. In across-sectional study, 48% of the school-age children in Kenya were found to brush their teeth every day (21).

In our study, it is of great importance that about half of the students did not have the habit of brushing the teeth at least two times in a day. Thus, it can be suggested that the attempts to develop the regional school health should focus on washing hands before the meals and daily brushing of the teeth.

The reliability and validity analyses were performed for PHSS in order to ensure the standardization for the assessments in the future school-health studies. For the reliability of a scale, the higher values for Cronbach alpha indicate the consistency between the items included in the scale and a Cronbach alpha value of 0.60 is required for the reliability (14). The Cronbach alpha value for PHSS was 0.845 with a scale alpha value ranging from 0.830 to 0.847 when an item was removed from the scale, indicating the high reliability for PHSS.

Factor analysis is used in order to determine the construct validity for the scale. The KMO (Kaiser-Meyer-Olkin) index of sample adequacy was greater than 0.90, suggesting the adequacy of the sample. Moreover, the factor loading for each item is required to be greater than 0.30 (22). The KMO and factor loadings for PHSS suggest the adequacy of construct validity of the scale. It has been also reported that item-total score correlation is important for showing the relationship between the toal score and the scores for each item and that a positive correlation greater than 0.20 indicates that items sample the similar behaviors and the scale has a high internal consistency (22). The validity and reliability of "Hand Hygiene

Beliefs" scale has been established by Mortel et al with an alpha value of 0.80 and an item-total score correlation ranging between 0.37 and 0.61 (23).

The item-total score correlation coefficients of PHSS ranged between 0.322 and 0.564. The validity and reliability analyses for PHSS suggest that this is a one-dimensional scale with an adequate validity and reliability.

In our study, the cut-off point for PHSS was calculated in order to facilitate the use of scale in practice. According to this, 27.7% of the students had a poor personal hygiene. In a cross-sectional study carried out on 669 students studying at classes 1-6 in Ethiopia, 52% of the students had adequate hygiene behaviors ranging from hand washing to general cleansing of the body (24). Despite the environmental deficiencies and challenges in accessing the cleansing equipments in less developed countries, about half of the Ethiopian students had an adequate hygiene, suggesting that poor hygiene status in about 30% of the students in the present study should not be ignored. However, it should be also stated that, in this study, the hygiene status was assessed by using a questionnaire which is based on self-report of the students and no clinical examination or diagnostic test was used for the assessment of hygiene status. In addition, it should be also kept in mind that hygiene behaviors are changed by individual habits, sociodemographic characteristics, cultural and social norms, and financial sources (1,25,26).

School-age children are in a continuous physical, psychological and social growth and development period. During this period, the interaction between the school and home may affect some behaviors in children and may differ between the genders (27). Among these, health-related hygiene practices are the leading behaviors that can be affected. Because girls usually copy the mother, help the housework and give importance to their appearance, they are usually cleaner. In addition, it should be also mentioned that social gender roles are effective on health behaviors. In a study assessing the hygiene status in primary school students in an urban area, hygiene scores have been found to be higher in female students compared to the male students (28). In our study, therefore, it is not surprising that personal hygiene status is better in girls than boys.

The family structure, which is the first and main component of the sociocultural environment in that the children grow, is determined by the sociodemographic characteristics of the family, educational level of parents, and family type. This family structure may also affect the health level of children. Although there are some exceptions, the higher education levels of parents facilitate accessing to information and having positive behaviors as well as positively contributes to the development and education of children (29). In our study, the

number of students having adequate hygiene status increased with the increasing maternal education level. In Indian school studies, the hygiene scores has been reported to be lower among the students having an illiterate mother (30) with similar results in another school study (6).

The studies from different countries have reported that the high frequency of infection with some micro-organisms in children having a large family may contribute to the development of immune system. However, because these parents usually do not spend enough time with their children, the personal hygiene behaviors in the children may be negatively affected (31,32). In parallel to these results, in our study, an adequate personal hygiene status was more common among the children from nuclear-type families.

In the less developed countries, personal hygişene status is usually inadequate due to the low family income level, adverse environmental conditions and poor health conditions of the house (2,29-33). Cetinkaya et al. have conducted a study in 3 primary schools differing in terms of socioeconomic level and have reported that the hygiene status is inadequate in the school with a low socioeconomic level compared to the other two schools (17). In our study, 11% of the students have reported that they are living in a shanty and 29% have reported that their family income level is less than 1000 TL monthly. The number of students having an adequate personal hygiene decreased with decreasing family income level. It should be noted that, in addition to the social and cultural norms, socioeconomic determinants also contribute to accessing the physical resources necessary for cleaning.

Because primary health care services constitute the major step for preventing the diseases, it is of great importance, particularly for children, to introduce the personal hygiene practices and to encourage gaining the hygiene behaviors with the school-family cooperation. In future community-based health programs, assessments performed by using an objective scale will be needed to identify the target group.

In conclusion, about one-quarter of the students had an inadequate personal hygiene status, suggesting that, in addition to the continuous school health educations, it is important to focus on programs aiming to develop the personal hygiene behaviors particularly in children with a low socioeconomic and parental education level, living in a large family, and in male students. This study may guide to the future studies on school health with suggesting that PHSS may be used as a reliable and valid scale which can be used easily.

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