An Application on Determining Hygiene Behaviors of University Students

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Abstract

This study examines the hygiene behaviors of university students. The research data is collected through a survey prepared according to the "Hygiene Behavior Scale" and applied to the students (N: 945) of four departments in Gazi University, Faculty of Industrial Arts Education, Ankara. It is a descriptive study. The most positive student hygiene behavior ($\overline{X}$ =3.60) was observed in the dimension of house hygiene. General hygiene ($\overline{X}$ =3.43), hand hygiene techniques ($\overline{X}$ =3.24), food hygiene ($\overline{X}$ =3.17), and personal hygiene ($\overline{X}$ =2.73) followed the house hygiene respectively. Behaviors of female students were found to be more positive in terms of general hygiene, house hygiene, food hygiene, and hand hygiene techniques. In addition, a significant relationship was found between gender and general hygiene, house hygiene, food hygiene, and hand hygiene techniques as well as between the social class variable and general hygiene, house hygiene, and food hygiene ($p<0.05$).

Keywords: Hygiene, university students, hygiene behavior

Introduction

Hygiene is defined as any application made and any sanitary precaution taken to be protected from environments that can damage our health (Güler, 2004; Yılmaz and Özkan, 2009). Hygiene issues include personal hygiene, which is defined as self-care applications that individuals carry out in order to maintain their health (Görgülü, 2000; Yetkin and Yiğitbaş, 2008). Personal hygiene is very important for protecting and maintaining health and addressing health problems (Yılmaz and Özkan, 2009) and is also fundamental to the prevention of many diseases, particularly contagious diseases. Personal hygiene precautions include hand-face hygiene; regular bathing; using soap and running water in the cleaning process; washing hands before preparing food, before and after eating meals and after using the bathroom; hair care; and washing and using one's own clothes, towels, shoes and slippers (Aslan et al., 2006; Yılmaz and Özkan 2009). Besides constituting a basis for personal and social health, hygiene is an indispensible part of living in society (Ural, 1972; Güler, 2004). Human beings are continuously affected by external environmental pollutants. Everyday activities may involve contact with many sources of environmental contamination; these may be touched with the hand, present on shoes while walking, or contained in dust on the body and hair; moving the hand to the mouth also causes microorganisms to enter the body.

The human body provides protection against external environment pollutants to some extent. However, skin cracks and wounds can allow pathogens to enter the body. For this reason, personal hygiene is one of the most important practices in terms of protecting the body from diseases (Güler, 2004). Hygiene is a personal matter. Hygiene practices, taught during childhood by mothers, fathers or teachers, mostly through practicing, need to be continued by the individual after childhood. Correct adoption of these habits has a direct impact on a person's future health (Yılmaz and Özkan, 2009) Hygiene behaviour includes hand hygiene, personal care, home hygiene and food hygiene (Stevenson et al., 2009). Individual hygiene behaviours can be affected by many factors, including beliefs, values, habits, socio-economic and cultural factors, level of knowledge, personal preferences, family characteristics, and physical and social characteristics of the work and living environments. Therefore, the hygiene habits of each individual differ, meaning that these habits are unique to individuals (Akşit, 1997; Görgülü, 2000). While previous studies have examined personal hygiene behaviours, attitudes and hand-washing habits of elementary school students (Güleç, Topbaş and Hadse, 2000; Guinan, Guckin and Ali, 2002; Örsal et all., 2002; Çan, Topbaş and Kapucu, 2004; Çetinkaya et al., 2005; Aslan, 2006; Kaya et al., 2006; Önsüz and Hıdıroğlu, 2008; Kaya and Aslan, 2009;

Yılmaz and Özkan, 2009), there are relatively few studies examining the personal hygiene behaviours of university students (Wong and Wai-San, 2005; Yetkin and Yiğitbaş,2008) no previous studies were found that examined the hygiene behaviours of university students using a "hygiene behaviour scale". For this reason, this study investigated the personal hygiene behaviours of 1st, 2nd, 3rd and 4th grade students from Ankara Gazi University. Study participants were recruited from the Industrial Arts Education Faculty, Department of Family and Consumer Science Education, Department of Computer Education, Industrial Technology Education Department, and Business Administration Education Department.

Method

The study population consists of students at Gazi University Industrial Arts Education Faculty. The study used a sample of the whole target population. Within this framework, 980 students were chosen by stratified sampling method on the basis of their grades . The "Hygiene Behaviour Scale" previously developed by Stevenson et al. (2009) was used to gather data on the hygiene behaviours of study participants. The survey used in the study consists of two parts. The first part investigated demographic characteristics of the students (gender, grade, education of mother, education of father and family income statue), and the second part included the hygiene behaviour scale, consisting of 27 items related to general hygiene, home hygiene, food hygiene, hand hygiene techniques and personal hygiene. The hygiene behaviour scale used a frequency distribution, with responses "never=1", "sometimes=2", "generally=3", "always=4" for the dimensions of general hygiene, home hygiene, food hygiene and hand hygiene techniques. As the scale includes negative responses within the dimension of personal hygiene (between the range of "never=4 and "always=1"), reciprocal grading was used. Within the home hygiene category, hygiene frequency was additionally indicated for grading each article: the "always " option indicates that the cleaning behaviour was carried out at least 3 times within the previous month, the "generally" option indicates two times, and the "sometimes" option indicates once within the previous month.

The study data was analyzed using SPSS (Version 14.01). Frequency and percentage values were used to describe the distributions of demographic characteristics and the sources of knowledge of hygiene issues. Frequency, percentage distribution, arithmetic mean and standard deviation were calculated for each item within the hygiene behaviour scale. The t test (for variables including two groups) and analysis of variance (for variables including more than two groups) were used to compare participants' demographic characteristics with dimensions of hygiene behaviours. Validation and reliability analysis was carried out and it was determined that the 27-item survey contained 5 factors (dimension-sub scale); the Cronbach's Alpha results were 81 for general hygiene, 82 for home hygiene, 71 for food hygiene, 67 for hand hygiene techniques and 69 for personal hygiene. Confirmatory factor analysis was performed using varimax rotation and principal components, to confirm the principal factors (dimensions) of the hygiene behaviour scale. The applicability of the factor analysis was checked using the Bartlett Test and the adequacy of the sample volume was checked through Kaiser-Meyer-Olkin (KMO) measure. For the reliability coefficients of each factor, Cronbach's Alpha values were calculated.

Results

Table 1 shows the distribution of participants according to some demographic characteristics. As shown in Table 1, 46.6 % of the participants are female and 53.4% are male. It was also found that the distribution changes between 20% and 30% as to the grades from which they received education. The fathers of 2.0% of the participants and the mothers of 13.2 % of the participants are illiterate, compared with 11.5% of participants' fathers and 3.1% of mothers who are graduates. 37.2% of participants were from families with a monthly household income of 500$ and below, while 15.7% of participants were from families with a monthly household income of 1001$ and above. Table 2 shows the distribution of knowledge sources indicated in the survey responses. The results show that information sources used are the family (95.6%), followed by school (77.8%), books (63.8%) and internet (54.8%).

Table 3 shows descriptive statistics, material factor loads and reliability coefficients with regard to the hygiene behaviours of the participants. The Kaiser-Meyer-Olkin value indicates the adequacy of the sample volume (KMO=.855) and the Bartlett Test indicates the applicability of the factor analysis ($p<.001$). It was determined that the hygiene scale consisted of 5 factors (dimension) explaining 69.94% of the total variance and all of the material factor loads constituting the scale were above 40. Cronbach's Alpha measures, indicating the reliability coefficients, were above 70 for every factor (Table 3). The findings shown in Table 3 indicate that the participants display the most positive hygiene behaviour in the home hygiene dimension ($\overline{X}$ =3.60), followed by general hygiene ($\overline{X}$ =3.43), hand hygiene techniques ($\overline{X}$ =3.24), food hygiene ($\overline{X}$ =3.17) and personal hygiene ($\overline{X}$ =2.73) dimensions. In the Home hygiene dimension, it was determined that the most positive behaviour was related to "toilet cleaning within the last month" ($\overline{X}$ =3.78).

In answer to the "always" option, 74.18% of participants stated that they cleaned the toilet at least three times during the last month, 11.64% indicated twice (the "generally" option), 2.75% indicated once ("sometimes") and 63% indicated that the toilet was "never" cleaned during the previous month. In the general hygiene dimension, the most positive behaviour was related to "Washing hands after using the toilet" (92.28% of participants answered "always", $\overline{X}$=3.89). It was also ascertained that the least positive behaviour ("never" 6.77%, "sometimes" 24.66%, "generally" 55.03%, and "always" 13.12% of participants) was related to "brushing the teeth" ($\overline{X}$=2.74). In terms of food hygiene, the most positive behaviour was related to "cleaning the kitchen cutting board with hot water and washing detergent" ($\overline{X}$=3.44), and the least expressed behaviour was "Using separate cutting-boards for raw and cooked foods" ($\overline{X}$=2.72). In the hand washing dimension, "Washing the hands with soap" ($\overline{X}$=3.74) and in the personal hygiene dimension, "Wearing the same skirt or trousers on two successive days" ($\overline{X}$=2.87) was the most expressed item.

Table 4 shows the analysis of variance and t test results of comparisons between demographic characteristics and hygiene behaviours. A statistically significant relationship was found between the general hygiene, home hygiene, food hygiene, hand hygiene techniques dimensions and gender; and between general hygiene, home hygiene, food hygiene dimensions and the school grade variable ($p<.05$). Although students whose mothers are university graduates had higher average scores in the general hygiene and personal hygiene dimensions, the hygiene behaviours of the students did not show a statistically significant variation with regard to their parents' educational level and income statue ($p>.05$). When the averages given in Table 4 are examined, it is observed that female students showed more positive behaviours in the general hygiene, home hygiene, food hygiene, hand hygiene techniques dimensions. In terms of the general hygiene, home hygiene and food hygiene dimensions, 4th grade students had lower average scores than students with other grades.

Discussion

It would be useful to detect the lack of hygiene information of individuals for the success of training and incentives to be prepared on this issue. Personal hygiene habits are initially formed within the family and then learned in school during formal education. (Çetinkaya et al., 2005). The study findings confirm that the family, as the major unit of society, has an enormous influence as a knowledge source on acquiring habits and behaviours about hygiene. This finding supports the earlier finding of Yetkin and Yiğitbaş (2008), who reported that, among students of Van Yüzüncü Yıl Health High School, the family was the most important source of hygiene information for students. In the present study, Cronbach's Alpha values showing reliability coefficients for each factor were .82 for general hygiene, .85 for home hygiene, .77 for food hygiene, .71 for hand hygiene and .83 for personal hygiene. Cronbach's Alpha values for each factor are above the .70 threshold determined by Stevenson et al. (2009).

Students expressed the most positive hygiene behaviour in the home hygiene $\overline{X}$=3.60 dimension, followed by general hygiene $\overline{X}$= 3.43, hand hygiene techniques $\overline{X}$=3.24, food hygiene $\overline{X}$=3.17 and personal hygiene $\overline{X}$ =2.73 dimensions. While the positive behaviours in home hygiene shows that students are more conscious about this matter, their less positive personal hygiene behaviours indicate the need to raise awareness among them in such a way to create desired behavioural changes. It was established that in the home hygiene dimension, the most positive behaviour was related to "cleaning the toilet in the last month" ($\overline{X}$=3.78). 74.18% of participants stated "always", indicating that they had cleaned the toilet at least 3 times during the last month. Toilets serve as a significant source for the occurrence and spread of any disease. It is necessary to take great care in toilet cleaning, in order to ensure a healthy environment, bacteria and smell control and a tidy environment (Şafak, 1997). While the most positive behaviour in terms of general hygiene was determined as "washing hands after using the bathroom (with 92.28% of participants answering "always") ($\overline{X}$ =3.89), it was determined that the least expressed behaviour was "brushing the teeth" ($\overline{X}$=2.74).

Hygiene is a personal issue with changing frequency for all; however, it is of great importance to wash hands after using bathroom and before touching food (Güler, 2004; Önsüz and Hıdıroğlu, 2008). Majority of students stated that they wash their hands after using bathroom, which is an indicator of the fact that they have positive behaviour towards this issue. Ardahan and Bay (2009) reported that all of the students in their study (100%) washed their hands after using the bathroom, while a study by Erbil and Aşık (2005) reported that 51.1% of students washed their hands after using the bathroom. It was observed that, in the food hygiene dimension, the most positive behaviour was "cleaning the cutting board in the kitchen with hot water and washing detergent" ($\overline{X}$=3.44), and the least expressed behaviour was "using separate cutting-boards for raw and cooked foods". ($\overline{X}$=2.72). Cutting boards in the kitchens are one of the utensils that present a risk of contagion. The surface of the cutting board may be colonized by pathogens after cutting raw foods with high pathogen microorganism potential such as meat and chicken. Subsequently cutting foods that are consumed uncooked, such as lettuce, causes these pathogens to pass other foods (Hancıoğlu and Karapınar, 2000).

Hand washing is regarded as the most important and effective method of infection control (Wong and Wai-San, 2005). 90-100% of the bacteria living on the temporary flora of the skin could be disposed through washing with soap and detergent. Use of soap during hand washing is highly crucial (Kanra and Kara, 1999). In the present study, "washing the hands with soap" ($\overline{X}$=3.74) is the most common behaviour in the hand hygiene techniques dimension. In terms of personal hygiene, it is important to wear clean underwear and clothes. In our study, "Wearing the same skirt or trousers two days successively" ($\overline{X}$=2.87) was the most common response within the personal hygiene category. A significant relationship was found between the gender variable and the dimensions of general hygiene, home hygiene, food hygiene, hand hygiene techniques; and between the school grade variable and the dimensions of general hygiene, home hygiene and food hygiene ($p<.05$).

Although in general hygiene and personal hygiene dimensions, students whose mothers are university graduates had higher average scores, the hygiene behaviours of the students did not show a statistically significant difference with regard to their parents' educational level and income status. In general, female students' behaviours in general hygiene, home hygiene, food hygiene and the hand hygiene dimensions are more positive. In general hygiene, home hygiene and food hygiene dimensions, it was determined that the average scores of the grade-4 students were lower than those of students with other grades. Yılmaz and Özkan (2009) found that female students had higher total point scores for personal hygiene than male students. In a study by Stevenson et al. (2009), female students expressed much more positive behaviours about hygiene than male students.

Conclusion

The study found that:

- The family was the primary source of hygiene information among students.
- Students expressed the most positive behaviours in the home hygiene dimension.
- It was determined that female students' behaviours were more positive in general hygiene, home hygiene, food hygiene, and the hand hygiene dimensions. A statistically significant relationship was found between general hygiene, home hygiene, food hygiene, hand hygiene techniques dimensions and gender; and between general hygiene, home hygiene, food hygiene categories and the school grade variable.

According to the study findings, it is suggested that:

- Students' low scores in personal hygiene suggest that awareness should be raised among them in such a way to create desired behavioural changes. Therefore, it is suggested that hygiene education programs should be developed to improve the personal hygiene habits of the students;
- As families have an important role as a knowledge source, they also should be informed about hygiene through mass media tools, seminars etc;
- It is suggested that the scope of the present research should be expanded to determine general hygiene behaviours within Turkey.

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Table 1. Demographic Characteristics of Participating University Students (n=945)

Variable	Group	Frequency	Percentage (%)
Gender	Female	440	46.6
	Male	505	53.4
School Grade	1	238	25.2
	2	197	20.8
	3	237	25.1
	4	273	28.9
Education of Father	Illiterate	19	2.0
	Primary School	416	44.0
	Secondary School	179	18.9
	High School	222	23.5
	University	109	11.5
Education of Mother	Illiterate	125	13.2
	Primary School	567	60.0
	Secondary School	120	12.7
	High School	104	11.0
	University	29	3.1
Monthly Income Status	500$ and below	352	37.2
	5001-1000 $	445	47.1
	1001 $ and above	148	15.7
Total		**945**	**100.0**

Table 2. University Students' Sources of Hygiene Information

Information Sources	Number (f)	Percentage (%)
Family	903	95.6
School	735	77.8
Books	603	63.8
Internet	518	54.8

Table 3. Descriptive Statistics, Material Factor Loads and Reliability Coefficients of Hygiene Behaviours among University Students

Factors	Articles	Never	Sometimes	Generally	Always	No Answer			Factor Load	Factor Ort. Cronbach's Alnha	
		%	%	%	%	%	$\bar{X}$	s.s.			
General Hygiene	1. Washing the hands within a day	.64	27.65	42.69	29.03	.00	3.00	.77	.632	3.43	.82
	2. Washing the hands when came from outside	.63	16.08	35.66	47.41	.21	3.30	.76	.711		
	3. Washing the hands when touched a pet or any animal	1.16	4.44	17.35	61.38	15.66	3.64	.77	.627		
	4. Washing the hands before meal	.32	7.72	32.59	57.99	1.38	3.50	.67	.466		
	5. Washing the hands before preparing a meal	.00	3.28	17.78	75.45	3.49	3.74	.55	.627		
	6. Washing the hands in the case of touching the face or body while cooking	2.75	19.68	32.59	41.27	3.70	3.16	.90	.646		
	7. Washing the fruits and vegetables before eating	.32	2.75	15.13	81.69	.11	3.78	.50	.635		
	8. Washing the hands after using the toilet	.21	2.12	5.19	92.28	.21	3.89	.38	.703		
	9. Covering/ Scrubbing the toilet seat while using a public convenience	2.43	6.24	19.58	51.64	20.11	3.50	.91	.546		
	10. Brushing the teeth	6.77	24.66	55.03	13.12	.42	2.74	.78	.498		
House Hygiene	11. Bathroom cleaning in the last one month	.63	3.81	15.13	67.41	13.02	3.71	.69	.773	3.60	.85
	12. Toilet cleaning in the last one month	.63	2.75	11.64	74.18	10.79	3.78	.62	.828		
	13. Kitchen cleaning in the last one month	.63	3.17	14.39	67.72	14.07	3.73	.68	.795		
	14. Refrigerator cleaning in the last one month	2.96	16.72	26.56	36.19	17.57	3.16	1.06	.656		
Food Hygiene	15. Washing the hands in case of touching raw foods and then cooked foods	2.75	17.67	36.83	40.74	2.01	3.17	.85	.714	3.17	.77
	16. Washing the utensils used after touching raw foods	2.12	12.80	33.54	49.95	1.59	3.33	.80	.704		
	17. Using separate cutting-boards for raw and cooked foods	16.10	22.35	30.08	28.18	3.28	2.72	1.11	.593		
	18. Cleaning the cutting board in the kitchen with hot water or washing liquid	1.48	8.04	33.02	53.54	3.92	3.44	.76	.461		
Hand Hygiene Techniques	19. Washing the hands with hot water	1.16	11.53	37.35	49.95	.00	3.36	.73	.607	3.24	.71
	20. Drying the hands completely after washing	.53	10.48	38.84	50.16	.00	3.38	.69	.638		
	21. Washing the hands with soap	.42	3.17	17.88	78.52	.00	3.74	.53	.577		
	22. Sufficiency of the time period of hand washing	1.27	17.25	44.13	37.14	.21	3.17	.76	.614		
	23. Using anti-bacterial gel or wet wipes for cleaning hands	16.08	35.98	27.51	20.32	.11	2.52	.99	.448		
Personal Hygiene	24. Wearing the same shirt or t-shirt two days successively	19.15	17.25	29.52	34.07	.00	2.79	1.11	.847	2.73	.83
	25. Wearing the same skirt or trousers two days successively	12.38	21.38	33.23	32.91	.11	2.87	1.01	.778		
	26. Wearing the same underwear two days successively	29.74	13.23	26.67	30.26	.11	2.58	1.20	.716		
	27. Going out without taking a shower or having a bath two days successively	27.94	11.85	21.06	38.94	.21	2.71	1.24	.721		

Table 4. University Students' Hygiene Behaviours according to Demographic Characteristics

Variable	Group	General Hygiene	Home Hygiene	Food Hygiene	Hand Hygiene Techniques	Personal Hygiene
		$\overline{X} \pm S_{\overline{X}}$	$\overline{X} \pm S_{\overline{X}}$	$\overline{X} \pm S_{\overline{X}}$	$\overline{X} \pm S_{\overline{X}}$	$\overline{X} \pm S_{\overline{X}}$
Gender	Female	3.56±.017	3.76±.018	3.27±.012	3.32±.019	2.25±.037
	Male	3.31±.012	3.48±.026	3.09±.025	3.16±.018	2.27±.026
	P	**.000*** **	**.000*** **	**.000*** **	**.000*** **	.694
Grade	1	3.43±.026a	3.72±.031a	3.26±.038a	3.28±.029	2.21±.055
	2	3.49±.023a	3.68±.032a	3.20±.042ab	3.25±.030	2.24±.060
	3	3.44±.022a	3.59±.031b	3.16±.041bc	3.24±.026	2.22±.057
	4	3.35±.02b	3.48±.036c	3.10±.037c	3.17±.028	2.35±.049
	P	**.003** **	**.000*** **	**.041* **	.681	.220
Education of Father	Illiterate	3.40±.099	3.77±.132	3.13±.139	3.22±.120	2.22±.176
	Primary School	3.43±.017	3.65±.024	3.20±.029	3.25±.021	2.24±.041
	Secondary School	3.42±.030	3.52±.042	3.16±.043	3.22±.034	2.26±.064
	High School	3.44±.023	3.60±.034	3.14±.043	3.23±.029	2.26±.057
	University	3.39±.036	3.55±.054	3.14±.059	3.18±.042	2.34±.079
	P	.855	.054	.683	.646	.855
Education of Mother	Illiterate	3.37±.033	3.64±.049	3.11±.052	3.16±.038	2.17±.068
	Primary School	3.42±.015	3.62±.020	3.19±.025	3.24±.018	2.25±.036
	Secondary School	3.44±.033	3.54±.053	3.20±.054	3.29±.041	2.27±.081
	High School	3.44±.037	3.57±.060	3.11±.066	3.21±.046	2.34±.084
	University	3.46±.073	3.53±.085	3.13±.133	3.18±.070	2.53±.137
	P	.581	.428	.509	.191	.263
Income Status	500 $ and below	3.41±.020	3.61±.028	3.19±.032	3.23±.024	2.23±.044
	501-100 $	3.41±.017	3.60±.024	3.15±.028	3.24±.020	2.24±.040
	1001 $ and above	3.47±.028	3.60±.043	3.20±.056	3.21±.037	2.38±.071
	P	.171	.984	.499	.705	.153

$^{*}p<.05$ $^{**}p<.01$ $^{***}p<.001$ ^{a,b,c} In terms of school grade variable, there is a statistically significant difference between the groups containing different letters on the same column