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Evaluation of the Knowledge and Attitudes of the Faculty of Dentistry Health Workers and Clinical Students Regarding Standard Precautions in COVID-19 Pandemic

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Abstract

Objective: The aim of this study is to evaluate the knowledge and practices of health personnel and fourth- and fifth-grade students in dental faculties regarding standard precautions and to examine their behaviors in this regard.

Methods: This study is of a cross-sectional descriptive nature. The data were collected by answering a questionnaire consisting of 35 questions developed by the researchers and prepared under 3 main headings. The questions were prepared as multiple-choice single-answer and multiple-choice multiple answers. The obtained data were analyzed by chi-square test. Results were reported as statistically significant at $P < .05$.

Results: In total, 12.5% of the participants are academic staff, 2.6% are research assistants, 1.3% are doctoral students, 16.2% are nurses, 8.6% are other health personnel, and 58.8% are fourth- and fifth-grade students. There is a statistically significant relationship between the injury status of the participants and their age, education, occupation, and duration of being in the faculty ($P < .05$). The knowledge levels of those who received in-service training on infection control (59.59%) about the existence of medical equipment were found to be statistically significantly higher ($P < .05$).

Conclusion: This study shows the data on attitudes and behaviors of dental faculty health workers in Turkey toward standard precautions.

Keywords: Dentistry, standard precautions, infection control

INTRODUCTION

Diseases that are transmitted by blood and droplets have special importance in hospital infections due to their frequency and long-term effects. These infections such as COVID-19, hepatitis A virus, hepatitis B virus, hepatitis C virus, and human immunodeficiency virus have become important public health problems today. Direct contact with pathogens can cause serious infections in people, as well as transmission from infected individuals to patients and other healthcare personnel. Although the application of infection control principles coincided with the 1950s, the application of standard precautions came forth with the emergence of acquired immunodeficiency syndome (AIDS) in the 1980s. The emergence of AIDS as a deadly disease spreading intercontinentally in the 1980s brought a new dimension to the infection control principles adopted in the 1950s. Therefore, attention is now focused on the fact that these diseases can not only infect patients but also health workers and other workers.[1-3] The best approach to prevent the transmission of blood- and droplet-borne infections is to prevent blood and droplet contact. Today, standard measures are widely accepted all over the world for the protection of both the patient and healthcare personnel from infectious diseases. For this reason, healthcare professionals need to know and apply standard precautions, if any, to eliminate their deficiencies.[3-5]

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Dentistry is a service that is directly exposed to aerosols consisting of body fluids such as saliva, blood, gingival crevicular fluid, and dental unit water in the oral cavity. It is a profession that knows the danger of cross-infection even before the COVID-19 pandemic and works with special infection control and prevention rules.[6]

Standard precautions before dental procedure are those applied to all patients, regardless of the patient's diagnosis and whether they have an infection or not. Gloves should be worn during contact with blood, all kinds of body fluids, and any body secretions except sweat. Hand hygiene should be provided after removing gloves after contact. Gloves should be changed when moving from a dirty area to a clean area on the patient. In cases where there is a possibility of splashing or spreading of body fluids or secretions to the environment, other personal protective equipment (gowns, masks, glasses, and overshoes) should be used in addition to gloves.

Surfaces (unit table and hoses, headrest, reflector arm, light equipment, x-ray head, telephone, cabinet top and handles, etc.) should be covered with disposable covers to protect them from contamination. If it cannot be covered, it should be disinfected.[7,8]

The cup that patients rinse their mouths with should be disposable. Mouthwash and high-volume aspirators help in decreasing the number of microorganisms in aerosols to be spread around the environment.[9,10]

The number of heterophilic water bacteria (noncoliform bacteria) should be lower than 200 cfu/mL in the quality of drinking water used in dental treatment.[11] Sterile water or sterile saline should be used in surgical procedures.

Handpieces, contra-angle handpieces, ultrasonic cleaning tools, and air–water syringes should be held over the cuspidor and run idle for at least 20-30 seconds.[12] The instruments to be used during the procedure should be sterilized by appropriate sterilization methods, and the packages coming out of the sterilization device should be stored properly.

The transfer of contaminated materials should be carried out in such a way as not to cause further contamination in the surrounding environment. After use, the needle tips should not be separated from the injector, the sheath should not be attached to the ends, it should not be bent, and the injectors should be thrown into special cutting–drilling tool boxes together with the tips.[13,14] These standard precautions for infection control are very important in dentistry clinics. The purpose of the present study, therefore, was to investigate the knowledge, attitudes, and practices regarding standard infection control measures among healthcare professionals and dental students.

METHODS

Ethical approval of the study was obtained from the Istanbul University-Cerrahpaşa Faculty of Medicine Clinical Research Ethics Committee (No: E-59491012-604.01.02-70501, Date: April 6, 2021).

The link, which was prepared in the Google Form survey system, was sent to the fourth- and fifth-grade students of faculty members, research assistants, doctoral students, nurses, and other health personnel in the Faculties of Dentistry of all universities in our country, via e-mail, mobile phone, and social media. The answers of 304 participants who answered the questionnaire were evaluated. In the survey, participants' age, gender, marital status, education, occupation, being in faculty, having an infectious disease, periodic health screening status, vaccination status, injury status, knowledge levels of standard precautions, use of protective equipment, and receiving training on infection control were examined.

Statistical Analysis

Data were analyzed using Statistical Package for the Social Sciences version 25.0 software. Chi-square test was used to compare percentage, mean, and analytically expressed data in descriptive statistics. Values with $P < .05$ were considered significant in comparisons.

Table 1. Demographic Data

Demographic Data		%
Age	17-24	59.4
	25-29	8.9
	30-40	13.2
	40+	18.5
Gender	Female	74.4
	Male	25.6
Profession	Fourth- to fifth-grade clinical students	58.8
	pHD students	1.3
	Research asistants	2.6
	Lecturers	12.5
	Nurses	16.2
	Other health personnels	8.6
Injury status	-	68.6
	1-2 times	25.4
	3 and more	5.9
Vaccination status	-	26.26
	COVID-19	25.25
	Hepatitis A	2.02
	Hepatitis B	10.10
	Tuberculosis	28.28
	Tetanus	8.08

RESULTS

In our study, 74.4% of the participants were female and 25.6% were male, and the demographic data are shown in Table 1. It is seen that 25.4% of the health professionals and clinical students working in the field of dentistry were injured by a sharp tool 1-2 times (Table 1).

When the vaccination status of the participants was examined, there was a statistically significant relationship ($P < .05$) between the vaccination status and the duration of being in the faculty. The COVID-19 vaccination rate for those who have been in the faculty for less than 2 years is 6.70%. It was observed that there was a statistically significant relationship ($P < .05$) between hepatitis A vaccination status and age, marital status, occupation, and length of stay in faculty. Hepatitis A vaccination rate among research assistants has the lowest rate among other occupational groups. There is a significant relationship between hepatitis B vaccination status, gender, and length of stay at the faculty ($P < .05$). Hepatitis B vaccination rate was found to be 2.97% in research assistant students. A statistically significant relationship was found between tuberculosis vaccination status, gender, and occupation ($P < .05$). There is a significant relationship between hepatitis B and tuberculosis vaccination status and gender ($P < .05$) (Table 2).

There is a statistically significant relationship between the injury status of the participants and their age, education, occupation, and duration of being in the faculty ($P < .05$). The injury rate was found to be lower in the 17-24 age group compared to other age groups (66.18%). Three or more injuries are more common in the 30-40 age group than in other age groups (50%); 3 or more injuries were seen in 38.88% of nurses compared to other groups. As the duration of the participants in the faculty increased, a significant increase was observed in the number of injuries ($P < .05$) (Table 3).

The level of knowledge about the presence of medical equipment (dental rotary handpiece) is higher in the 17-24

Table 2. Comparison of Vaccination Status with Demographic Data

		Vaccination Status (%)					
		(-)	COVID-19	Hepatitis A	Hepatitis B	Tuberculosis	Tetanus
Age	17-24	76.9	52.00	72.4	54.5	59.32	61.24
	25-29	7.7	9.8	12.7	11.4	11.86	10.67
	30-40	7.7	14.0	9.2	15.3	11.02	11.80
	40+	7.7	24.2	5.7	18.8	17.80	16.29
P		.38	.01*	.01*	.12	.51	.3
Gender	Female	69.23	66.36	79.31	78.22	81.36	78.65
	Male	30.77	33.64	20.69	21.78	18.64	21.35
P		.78	.36	.37	.05*	.025*	.06
Marital status	Married	19.23	31.44	14.94	29.21	23.73	24.72
	Single	80.77	68.56	85.06	70.79	76.27	75.28
P		.31	.06	.01*	.44	.2	.15
Education level	High school	3.85	5.67	8.05	5.94	9.32	7.30
	Associate degree	19.23	4.13	10.35	6.93	10.17	8.99
	Bachelor's degree	61.54	58.25	65.50	56.93	59.32	58.43
	Master degree	11.53	10.30	9.20	11.39	7.63	11.80
	Doctoral degree	3.85	21.65	6.90	18.81	13.56	13.48
P		.18	.02*	.035*	.6	.09	.18
Profession	Fourth- to fifth-grade clinical students	65.40	54.63	67.80	54.46	60.18	59.55
	pHD students	0	2.06	5.75	3.46	2.54	0.56
	Research asistants	0	2.57	2.30	2.97	2.54	2.82
	Lecturers	0	16.49	4.60	15.34	12.71	10.67
	Nurses	11.53	19.1	8.06	16.83	12.71	15.73
	Other health personnels	23.07	5.15	11.49	6.94	9.32	10.67
P		.13	.001*	.002*	.18	.5	.6
Duration of stay at the faculty	<2 years	30.77	6.70	16.1	10.89	11.86	11.23
	2-4 years	46.15	33.50	41.38	36.14	43.23	42.69
	4-6 years	11.54	32.47	32.18	30.20	26.27	28.65
	6 and 6+ years	11.54	27.33	10.34	22.77	18.64	17.41
P		.01*	.01*	.012*	.04*	.9	.18

Chi-square test, *$P < .05$.

Table 3. Comparison of Injury Status with Demographic Data

		Injury Status (%)			
		(-)	1-2 times	3 and more	*P*
Age	17-24	66.18	48.05	22.22	.01*
	25-29	8.69	11.69	0	
	30-40	8.21	18.18	50	
	40+	16.92	22.08	27.78	
Education level	High school	5.80	5.19	5.56	.01*
	Associate degree	10.14	3.90	0	
	Bachelor's degree	63.28	48.05	50	
	Master degree	11.6	7.80	22.22	
	Doctoral degree	9.18	35.06	22.22	
Profession	Fourth- to fifth-grade clinical students	63.28	48.05	22.22	.01*
	pHD students	0.48	3.90	0	
	Research asistants	1.93	3.90	5.55	
	Lecturers	7.25	24.68	22.22	
	Nurses	15.46	12.97	38.88	
	Other health personnels	11.6	6.50	11.13	
Duration of stay at the faculty	<2 years	13.53	5.2	5.56	.01*
	2-4 years	48.31	25.97	22.22	
	4-6 years	22.71	33.76	27.78	
	6 and 6+ years	15.45	35.07	44.44	

Chi-square test, *$P < .05$.

Table 4. Comparison of Knowledge Status About Medical Equipment

		State of Knowledge About the Medical Equipment(%)	
		(+)	(-)
Age	**17-24**	72.60	46.15
	25-29	10.27	7.69
	30-40	7.53	18.59
	40+	9.6	27.57
P		.01*	
Gender	**Female**	71.92	76.28
	Male	28.08	23.72
P		.01*	
Profession	**Fourth- to fifth-grade clinical students**	75.34	39.74
	pHD students	0.69	1.93
	Research asistants	2.05	3.20
	Lecturers	10.96	14.10
	Nurses	4.8	26.93
	Other health personnels	6.16	14.10
P		.01*	
Duration of stay at the faculty	**<2 years**	10.27	11.54
	2-4 years	45.89	36.54
	4-6 years	32.88	19.23
	6 and 6+ years	10.96	32.69
P		.01*	
Received education on infection control	**In-service training**	59.59	60.90
	Other education	2.74	16.02
	I did not receive education	13.70	5.13
	I do not remember	23.97	17.95
P		.01*	

Chi-square test, *$P < .05$.

age group (72.60%) than in other age groups, and there is a statistically significant relationship between them ($P < .05$). The knowledge level of the fourth- to fifth-grade clinical student about the existence of medical equipment was found to be statistically significantly higher than the other occupational groups ($P < .05$). The knowledge levels of those who received in-service training on infection control (59.59%) about the existence of medical equipment were found to be statistically significantly higher ($P < .05$) (Table 4).

It was observed that there was a significant relationship between the state of washing hands with hand soap/hand antiseptic, using bones, a protective apron before dental procedure, and marital status ($P < .05$). There was a significant relationship between the state of using gloves, glasses, a protective apron, bones, and age groups (Table 5).

DISCUSSION

Faculty of dentistry healthcare professionals and clinical students work in an environment with a high risk of infection. For this reason, they are responsible for protecting both themselves and patients from cross-infection.[15]

In the section of vaccines recommended to healthcare workers within the scope of the "Vaccination Due to Occupational Risks" program in our country, the Ministry of Health stated the necessity of vaccination for diphtheria-tetanus, Measles-rubella-mumps, seasonal influenza, hepatitis B, chickenpox, hepatitis A, and meningococcus.[16] In our study, the importance of the vaccine applications of the Ministry of Health is emphasized once again and it is investigated whether these vaccines are applied or not. In addition, in our study, the status of vaccination against the ongoing COVID-19 pandemic was also examined.

According to the data of the COVID-19 vaccine platform of the Ministry of Health on 29 November 2021, the rate of people aged 18 and over who received the second dose of COVID-19 vaccine was stated as 81.21%.[17] In our study, 64.5% of the participants stated that they had the COVID-19 vaccine. Considering that health personnel and clinical students working in the field of dentistry are at high risk for

Table 5. Comparison of the Level of Implementation of Standard Measures with the Demographic Data

	Age(%)				Marital Status(%)		Profession(%)					
Using Hand Soap/ Antiseptic	*17-24*	*25-29*	*30-40*	*40+*	*Married*	*Single*	*Fourth- to Fifth-Grade Clinical Student*	*pHD Student*	*Research Asistant*	*Lecturer*	*Nurse*	*Other Health Personnel*
Never	0.56	0	2.5	1.75	1.19	0.92	0.58	0	0	0	2.04	3.23
Always	75.28	77.78	80	71.9	72.62	76.6	76.76	100	50	81.58	73.47	67.74
Often	17.42	14.81	15	24.6	25	15.6	16.86	0	25	13.16	24.49	22.58
Sometimes	6.74	7.41	2.5	1.75	1.19	6.88	5.8	0	25	5.26	0	6.45
P	.849				**.01***				.068			
Using gloves												
Never	0	0	2.5	0	1.19	0	0	0	0	0	0	3.23
Always	94.38	100	92.5	82.46	86.91	94.50	95.35	100	87.5	97.37	83.68	83.87
Often	1.69	0	2.5	10.53	7.14	1.83	1.16	0	0	2.63	10.20	6.45
Sometimes	3.93	0	2.5	7.02	4.76	3.67	3.49	0	15.5	0	6.12	6.45
P	**.02***				.071				**.001***			
Using a mask												
Never	0	0	2.5	0	1.19	0	0	0	0	0	0	3.33
Always	93.26	88.89	92.5	91.23	91.67	92.66	93.02	75	87.5	100	95.92	80
Often	2.25	11.11	5	5.26	4.76	3.67	2.91	25	0	0	4.08	13.33
Sometimes	4.49	0	0	3.51	2.38	3.67	4.07	0	12.5	0	0	3.33
P	.422				.378				**.001***			
Using safety glasses												
Never	1.12	11.11	15	5.26	7.14	3.67	1.16	0	12.5	2.63	12.25	13.33
Always	42.70	29.63	47.5	43.86	44.05	41.74	43.61	0	37.5	60.53	30.61	40
Often	34.83	51.85	20	15.79	22.62	33.95	37.21	100	37.5	21.05	14.29	23.33
Sometimes	21.35	7.41	17.5	35.09	26.19	20.64	18.02	0	12.5	15.79	42.85	23.33
P	**.001***				.230				**.000***			
Using a protective apron												
Never	1.12	3.70	2.5	3.50	1.19	2.29	1.16	0	**0**	2.63	2.04	6.45
Always	84.83	77.78	70	61.40	65.48	82.57	86.63	75	75	86.85	48.98	64.52
Often	5.62	18.52	17.5	8.77	14.29	6.88	5.23	0	12.5	5.26	18.37	19.35
Sometimes	8.43		10	26.33	19.04	8.26	6.98	25	12.5	5.26	30.61	9.68
P	**.000***				**.001***				**.01***			
Using bones												
Never	5.62	11.11	10	7.02	5.95	6.42	4.65	0	12.5	2.64	10.20	12.90
Always	72.47	62.96	55	43.86	48.81	69.72	75	25	37.5	57.89	42.86	54.84
Often	9.55	22.22	17.5	19.30	20.24	11.01	9.88	50	37.5	23.68	14.29	9.68
Sometimes	12.36	11.11	17.5	29.82	25	12.84	10.47	25	12.5	15.79	32.65	22.58
P	**.031***				**.003***				**.000***			

Chi-square test, *$P < .05$.

COVID-19 infection, it is seen that the vaccination rate is not very high. This may be due to the fact that dentists think that the ways they routinely apply to prevent infection are sufficient.

Hepatitis A virus is the most common acute viral infectious agent in the world and is transmitted by contact with sick people and unhealthy drinking water or food. In terms of HAV epidemiology, since our country is in the middle endemic group, exposure to the virus is later and acute HAV cases are concentrated in adolescents and adults. In this age group, the disease progresses more seriously and hepatitis A epidemics are observed.[18] Considering the importance of hepatitis A vaccine in our study, the rate of vaccination of dentistry clinical class students is 67.81%.

Since the rate of exposure to HBV is high in dentistry, vaccination against HBV is important for infection control. In studies on this subject, it is seen that most of the dentistry students have been vaccinated against hepatitis B.[19-23] In our study, it was seen that 77% of all participants and 54.46% of clinical class students had hepatitis B vaccine. Vaccination percentage rates of students were found to be lower than the rates in other studies. This situation suggests that students are insufficiently informed about the importance of vaccination in infection control and vaccination follow-ups are not carried out regularly.

The protection of the tetanus vaccine has an important place in the sharp-stinging medical instrument injuries of healthcare workers. In the study by Kechagia et al[20], 80.2% of dentistry students stated that they had tetanus vaccination. In our study, the rate of fourth- to fifth-grade dentistry students who had tetanus vaccine was 59.55% ($P > .6$), which is lower than the study by Kechagia et al.[20]

In terms of blood-borne infections, it has been reported that 20 different pathogenic agents can be transmitted to healthcare workers through stab wounds.[24] Injuries occur more frequently due to the fact that piercing tools and equipment form the basis of education and patient treatment of the Faculty of Dentistry. Altindiş et al[19] stated that 36.5% of dentistry students had puncture wounds, 13.98% had a contaminated injector puncture, 41.75% had mucosal contact, and 1.62% had infected incisions. In our study, it was determined that 48.05% of fourth- to fifth-grade dentistry students had stab wounds.

Özyiğit et al[24] stated that the rate of stab wounds, which is 18.1% in general among nurses, is at the level of 70-75% among nurses working in the operating room and emergency units. In our study, it was seen that 38.89% of the nurses working in the faculty of dentistry faced 3 or more injuries.

Can et al[25] reported that 47.6% of the participants received in-service training on infection control in their study on healthcare professionals and clinical students at the faculty of dentistry. In our study, this rate was found to be higher. This situation suggests that it may be due to the anxiety caused by the ongoing COVID-19 pandemic and its consequences.

Hand washing is a universal method that can prevent infections. Therefore, in our study, the hand washing rate of clinical students before dental treatments was evaluated and was determined as 57.89%, and these findings are similar to those of Kechagia et al.[20] However, the low rate of hand washing, which is extremely important in terms of infections, may be due to the students' thinking that their use of gloves would be more effective.

In our study, the use of protective glasses and disposable aprons by clinical students was found to be higher than previous studies. This may be due to the fact that the COVID-19 pandemic period pays more attention to the ways of protection from infection.[19,20]

The vaccination program applied to dentists, healthcare professionals, and clinical students is essentially the same as our national vaccination program. The reason why the vaccination rate of our dentists, healthcare workers, and clinical students is not 100% is the insufficient understanding of the importance of our national childhood vaccination program, the failure to regularly check the antibody levels after vaccination, and the lack of regular data entry. Vaccination forms the basis of the infection control program.

Disruptions in the vaccination program put dentists, healthcare professionals, and clinical students at risk when they start work and school. The national vaccination program should be reviewed, improvements should be made, necessary inspections should be tightened, and necessary sanctions should be applied.

Health information courses should be added to the curriculum from primary school and hygiene trainings, the importance of vaccination, infectious diseases and prevention methods, and basic diseases should be explained to children. The importance of reading should be explained while ensuring that these subjects are learned until the university.

Research carried out to date havfe mentioned the inadequacy of the infection control program and the importance of education has been expressed. In our opinion, education should continue in an important and intermittently repeated process that will be sanctioned.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of İstanbul University-Cerrahpaşa University (Date: April 6, 2021 approval No: A-50).

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