ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

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Evaluation of Undergraduate Dentistry Students' General Knowledge Level and Attitudes About HIV/AIDS: A Survey Study

Diş Hekimliği Lisans Öğrencilerinin HIV/AIDS Hakkındaki Genel Bilgi Düzeyleri ve Tutumlarının Değerlendirilmesi: Anket Çalışması

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ABSTRACT Objective: The aim of this study is to determine the level of knowledge of dental students about human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS) and to assess their attitudes toward AIDS patients. **Material and Methods:** A total of 689 dental students from different grade level, studying at 32 different universities in Türkiye participated in the survey, which was conducted between January 2021 and March 2021 using the Google survey tool and investigated dental students' general knowledge and attitudes about HIV/AIDS. Participants were presented with a questionnaire consisting of 3 questions on demographic information, 10 questions on general knowledge about HIV/AIDS, and 10 questions assessing their attitude toward HIV/AIDS. Data were analyzed using SPSS 20.0 software. The chi-square test was used to compare percentage, mean, and analytically expressed data in descriptive statistics. Values with $p<0.05$ were considered significant in comparisons. **Results:** There was a statistically significant difference in student responses to all knowledge questions between grade level ($p<0.05$). In addition, there was a statistically significant difference in responses to all attitude questions ($p<0.05$), except for the question "Do you attend the HIV/AIDS information and education seminar?" ($p>0.05$). The 5th-grade students answered the question about HIV/AIDS oral lesions more correctly than the other grades (42.5%). The most 4th grade students answered "Yes" to the question about concern of HIV transmission when treating patients (73.1%). **Conclusion:** The main findings were the students' low level of knowledge about oral HIV/AIDS lesions and their anxiety when treating HIV/AIDS-positive patients. Dental students should be trained to improve their knowledge and attitude toward HIV/AIDS.

Keywords: Acquired immune deficiency syndrome; dentistry; survey; knowledge; human immunodeficiency virus

ÖZET Amaç: Bu çalışmanın amacı, diş hekimliği öğrencilerinin insan bağışıklık yetmezliği virüsü [human immunodeficiency virus (HIV)]/ edinilmiş bağışıklık eksikliği sendromu [acquired immune deficiency syndrome (AIDS)] hakkındaki bilgi düzeylerini belirlemek ve AIDS hastalarına yönelik tutumlarını değerlendirmektir. **Gereç ve Yöntemler:** Ocak 2021-Mart 2021 tarihleri arasında gerçekleştirilen ve diş hekimliği öğrencilerinin HIV/AIDS'e yönelik genel bilgi ve tutumlarının Google anket aracı kullanılarak araştırıldığı ankete, Türkiye'de 32 farklı üniversitede öğrenim görmekte olan farklı sınıf düzeylerinden toplam 689 diş hekimi öğrencisi katılmıştır. Katılımcılara demografik bilgilerle ilgili 3 soru, HIV/AIDS hakkında genel bilgi düzeylerini değerlendiren 10 soru ve HIV/AIDS'e karşı tutumlarını değerlendiren 10 sorudan oluşan bir anket sunulmuştur. Veriler SPSS 20.0 yazılımı kullanılarak analiz edilmiştir. Tanımlayıcı istatistiklerde yüzde, ortalama ve analitik olarak ifade edilen verileri karşılaştırmak için ki-kare testi kullanıldı. Karşılaştırmalarda $p<0,05$ olan değerler anlamlı kabul edilmiştir. **Bulgular:** Öğrencilerin tüm bilgi sorularına verdikleri yanıtlarda sınıf seviyeleri arasında istatistiksel olarak anlamlı farklılık saptandı ($p<0,05$). Ayrıca "HIV/AIDS bilgilendirme ve eğitim seminerine katılır mısınız?" sorusu dışındaki ($p>0,05$), tüm tutum sorularına verilen yanıtlarda istatistiksel olarak anlamlı farklılık belirlendi ($p<0,05$). Beşinci sınıf öğrencileri HIV/AIDS ağız lezyonları ile ilgili soruya diğer sınıflara göre (%42,5) daha doğru cevap vermişlerdir. Hastaları tedavi ederken HIV bulaşması endişesi ile ilgili soruya en fazla 4. sınıf öğrencisi (%73,1) "Evet" yanıtı vermiştir. **Sonuç:** Ana bulgular, öğrencilerin oral HIV/AIDS lezyonları hakkında bilgi düzeylerinin düşük olması ve HIV/AIDS pozitif hastaları tedavi ederken kaygı duymalarıdır. Diş hekimliği öğrencilerine HIV/AIDS'e karşı bilgi ve tutumlarını geliştirmek için eğitim verilmelidir.

Anahtar Kelimeler: Edinilmiş bağışıklık eksikliği sendromu; diş hekimliği; anket; bilgi; insan bağışıklık yetmezliği virüsü

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AIDS, which consists of the initials of the words acquired immune deficiency syndrome, is an infectious disease that was defined in the USA before 1980, spread rapidly throughout the world, and then caused panic because of the many deaths.[1] The causative agent is the human immunodeficiency virus (HIV), which colonizes T4 lymphocytes and causes immune deficiency.[1] The cause of symptoms and death in HIV-infected people is not HIV itself, but other infections to which the body is completely susceptible because of the deterioration of the immune system. Therefore, it may clinically difficult to distinguish HIV-positive people.[1] Detection of anti-HIV antibodies in serological tests is the most commonly used method for diagnosing the infection.[2] There is still no known vaccine for AIDS. The main reason for this is that no cases of natural elimination of the HIV infection are known so far, and therefore the causal protective mechanisms have not been finally clarified. This means that immune responses triggered by HIV infection in the human body may not be effective in preventing HIV infection.[3] But vaccine trials are still being conducted today.[3] In the treatment of HIV infection, there is not a treatment that eliminates the virus yet, but there are drugs that control the replication of the virus. The common name of these drugs is "antiretrovirals" and treatment with these drugs is antiretroviral therapy (ART). Thanks to advances in the development of antiretroviral drugs, HIV infection has evolved from a fatal disease to a manageable chronic disease.[4] Antiretroviral drugs have been used to treat HIV infection for almost two decades. Used properly, antiretroviral treatment almost completely suppresses HIV replication, stimulates immunity, and significantly reduces the risk of acquiring AIDS.[5] However, ART is not a cure; when the drugs are stopped, the virus almost always returns within the 13th week.[5] HIV-infected patients may have various lesions in the oral cavity and gums, and recurrent or persistent oral aphthae may be among the first symptoms. Therefore, dentists must be aware of HIV-related symptoms and oral lesions.[6] Even though mortality rates decrease, lives are prolonged and transmission rates are minimized with early diagnosis, treatment, and precautions to be taken, dentists are still in a high-risk group for cross contamination because dental treatment practices often involve blood and saliva.[6] Saliva, which can contain blood-borne pathogens and microorganisms like HIV, can pose a risk to dentists.[7]

In light of this information, it is important that healthcare workers are aware of HIV/AIDS and demonstrate the attitude, behavior, and precautions to be taken in the event of an encounter with an HIV-positive patient in order to protect both themselves and the patient. The aim of the study is to determine the level of knowledge of dental students about HIV/AIDS and to assess their attitude towards AIDS patients.

MATERIAL AND METHODS

This survey study was conducted with 689 dental students from different universities from 1st, 2nd, 3rd, 4th, and, 5th grade. The study protocol was approved by the Ethics Committee of the Faculty of Dentistry, Ankara University (date: March 3, 2021, no: 05/04). The study was conducted in full compliance with the Declaration of Helsinki.

This cross-sectional study examined dental students' general knowledge and attitudes about HIV/AIDS. A total of 689 dental students of different grade level studying at 32 different universities in Türkiye participated in the survey, which was conducted between January 2021 and March 2021. The scale used in the study was conducted with the Google survey tool and distributed through the WhatsApp (WhatsApp Inc.,Mountian View, CA, USA) application. An informed consent question was added to the electronic survey and each participant agreed to participate in the survey. Participants who consented to the study were presented with a questionnaire consisting of 3 questions with demographic information, 10 questions with information about HIV/AIDS, and 10 questions assessing their attitude toward HIV/AIDS. The age, gender, and class distribution of the participants is shown in Table 1. The survey questions prepared for this purpose are shown in Table 2 and Table 3. Eight questions measuring the level of knowledge about HIV/AIDS were prepared as correct judgments and the participants were asked to answer "Yes", "No" or "Not sure" (Table 2). The 8th question measuring knowl-

edge level was asked as a multiple-choice question (Table 2). Question 9 had more than one answer. The 9th question measuring attitude toward HIV/AIDS was prepared in the form of prejudice statements and participants were asked to answer Yes", "No" or "Not sure" (Table 3). Question 9 of the questions about attitude had more than one answer. It was digitized using the Google survey tool and all the entered data were transferred to MS Excel.

STATISTICAL ANALYSIS

Data were analyzed using SPSS 20.0 software (SPSS Inc., Chicago, IL, USA). The chi-square test was used to compare percentage, mean, and analytically expressed data in descriptive statistics. Values with $p<0.05$ were considered significant in comparisons.

RESULTS

The study was conducted with a total of 689 students whose mean age was 21.14±1.72'453 (65.8%) male and 235 (34.2%) female (Table 1).

There were significant differences in responses to all knowledge questions when grade level were compared ($p<0.05$). When participants' responses to the knowledge questions were examined, 5th-grade students answered correctly at a rate of 66.4% on Q1, 79.1% on Q3, 42.5% on Q8, and 52.2% on Q10 (Table 2). Moreover, as grade level increased, so did the rate of correct answers to these questions. It is remarkable that the rate of correct answers to Q8 is quite low for students in grades 1, 2, and 3. The students who answered Q4, Q5, and Q7 most accurately were 4th-grade students with 87.7%, 91.5%, and 73.8%, respectively. These values are very similar to the values of 5th-grade students. On the other hand, 3rd-grade students formed the class group that gave the most correct answers to Q2 and Q6 (Table 2). In Q9, which examined HIV transmission routes, the options of blood route, injecting and parenteral contact, and sexual route were prominent with 96.2% and 97.2%, respectively. The general knowledge questions asked in the survey and the answers given by participants are shown in Table 2.

TABLE 1: Characteristics of the participants.

	$\bar{X}$±SD Median (Minimum-Maximum)	
Age	21.14±1.72 21 (18-28)	
	n	%
Gender		
Male	235	34.2
Female	453	65.8
Class		
1st-grade	133	19.3
2nd-grade	153	22.2
3rd-grade	139	20.2
4th-grade	130	18.9
5th-grade	134	19.4

SD: Standard deviation

There was also a significant difference in responses to all attitudinal questions when grade level were compared ($p<0.05$), except for the question "Do you attend the HIV/AIDS information and education seminar?" ($p>0.05$).

The students who answered "Yes" most frequently to Q11 were 4th-grade students with a rate of 98.5%. In addition, all grades gave a high rate of "Yes" responses to this question. While the students who most frequently answered "No" (64.2%) to Q12 were 5th-grade students, the students who most frequently answered "Yes" (48.9%) were 1st-grade students. While 5th-grade students were the most likely to answer "No" (23.9%) to Q15, 4th-grade students were the most likely to answer "Yes" (73.1%). The percentages of 5th-grade students who answered "Yes" to S13 and S14 were 93.3% and 84.3%, respectively. The group that most often answered "No" to questions consisted of 1st-year students (Table 3). While the students who most often answered "No" (49.3%) to Q16 were 5th-grade students, the students who most often answered "Yes" (56.4%) were 1st-grade students. While 78.4% of 5th-grade students answered "No" to Q17, 1st-grade students were the most likely to say "Yes" (18.8%). The students who most frequently answered "Yes" to Q18 and S20 were 5th-grade students. While 4th-grade students most frequently answered "No" to Q18, 1st-grade students most frequently answered "No" to Q20 (Table 3). When asked about HIV/AIDS information channels, the first response is the internet (80.8%). The attitudes questions asked in the survey and the answers given by the participants are shown in Table 3.

TABLE 2: Comparison of the participants' answers to the knowledge questions according to their class.

	1st-grade		2nd-grade		3rd-grade		4th-grade		5th-grade			
Answers	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**Test statistic**	**p value**
Q1: Is HIV positivity and AIDS the same thing?												
Yes	29	21.8	35	22.9	45	32.4	43	33.1	31	23.1	χ^2=59.309	0.000
No	51	38.3	70	45.8	64	46	74	56.9	89	66.4		
No idea	53	39.8	48	31.4	30	21.6	13	10	14	10.4		
Q2: Can HIV-positive people have a healthy appearance?												
Yes	113	85	134	87.6	134	96.4	122	93.8	126	94	χ^2=23.809	0.002
No	5	3.8	4	2.6	2	1.4	5	3.8	5	3.7		
No idea	15	11.3	15	9.8	3	2.2	3	2.3	3	2.2		
Q3: Can HIV-infected people live a normal life?												
Yes	63	47.4	88	57.5	98	70.5	92	70.8	106	79.1	χ^2=40.795	0.000
No	20	22.6	30	19.6	24	17.3	20	15.4	15	11.2		
No idea	40	30.1	35	22.9	17	12.2	18	13.8	13	9.7		
Q4: Can HIV positivity be diagnosed with a blood test?												
Yes	105	78.9	122	79.7	116	83.5	114	87.7	117	87.3	χ2=16.490	0.036
No	5	3.8	1	0.7	2	1.4	4	3.1	6	4.5		
No idea	23	17.3	30	19.6	21	15.1	12	9.2	11	8.2		
Q5: Is AIDS a disease for which there is a vaccine?												
Yes	11	8.3	4	2.6	7	5.0	4	3.1	7	5.2	χ^2=35.728	0.000
No	96	72.2	120	78.4	120	86.3	119	91.5	121	90.3		
No idea	26	19.5	29	19	12	8.6	7	5.4	6	4.5		
Q6: Is AIDS a curable disease?												
Yes	22	16.5	27	17.6	16	11.5	29	22.3	31	23.1	χ^2=21.152	0.007
No	78	58.6	78	51	90	64.7	84	64.6	77	57.5		
No idea	33	24.8	48	31.4	33	23.7	17	13.1	26	19.4		
Q7: Do all HIV-positive patients have lesions in their mouths?												
Yes	7	5.3	2	1.3	2	1.4	13	10	21	15.7	χ^2=116.675	0.000
No	52	39.1	75	49	73	52.5	96	73.8	98	73.1		
No idea	74	55.6	76	49.7	64	46	21	16.2	15	11.2		
Q8: Which oral lesions are most common in HIV-positive patients?												
Kaposi sarcoma	-	-	-	-	4	2.9	25	19.2	30	22.4	χ^2=367.003	0.000
Oral hairy leukoplakia	1	0.8	7	4.6	7	5.0	19	14.6	29	21.6		
Oral candidiasis	3	2.3	8	5.2	16	11.5	49	37.7	57	42.5		
Acute necrotizing gingivitis	5	3.8	15	9.8	19	13.7	9	6.9	6	4.5		
No idea	124	93.2	123	80.4	93	66.9	28	21.5	12	9.0		
Q10: Is there a prophylactic use for the infected person in case of an injury by an HIV-positive patient with a percutaneous sharp instrument?												
Yes	32	24.1	48	31.4	61	43.9	65	50	70	52.2	χ^2 =73.612	0.000
No	2	1.5	8	5.2	5	3.6	12	9.2	21	15.7		
No idea	99	74.4	97	63.4	73	52.5	53	40.8	43	32.1		

Since more than one option was selected in Q9, it is not shown in the table; HIV: Human immunodeficiency virus; AIDS: Acquired immune deficiency syndrome

TABLE 3: Comparison of participants' responses to the attitudinal questions by class.

	1st-grade		2nd-grade		3rd-grade		4th-grade		5th-grade			
Answers	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**Test statistic**	**p value**
Q11: Does the medical staff have the right to know that their patient has AIDS?												
Yes	124	93.2	137	89.5	134	96.4	128	98.5	124	92.5	χ^2=20.119	0.005
No	3	2.3	8	5.2	-	-	2	1.5	7	5.2		
No idea	6	4.5	8	5.2	5	3.6	-	-	3	2.2		
Q12: Any patient undergoing a dental procedure should have a blood test for HIV infection.												
Yes	65	48.9	73	47.7	66	47.5	45	34.6	29	21.6	χ^2=63.646	0.000
No	32	24.1	41	26.8	48	34.5	58	44.6	86	64.2		
No idea	36	27.1	39	25.5	25	18	27	20.8	19	14.2		
Q13: All patients in dental clinics should be treated as HIV positive.												
Yes	80	60.2	128	83.7	127	91.4	120	92.3	125	93.3	χ^2=82.414	0.000
No	15	11.3	11	7.2	3	2.2	4	3.1	5	3.7		
No idea	38	28.6	14	9.2	9	6.5	6	4.6	4	3.0		
Q14: Would you allow a patient to receive dental treatment if they stated they were HIV positive?												
Yes	53	39.8	70	45.8	80	57.6	84	64.6	113	84.3	χ^2=70.380	0.000
No	24	18	18	11.8	14	10	13	10	7	5.2		
No idea	56	42.2	65	42.5	45	32.4	33	25.4	14	10.4		
Q15: Are you concerned that the patient could transmit HIV to you during a dental procedure?												
Yes	64	48.2	102	66.7	92	66.2	95	73.1	90	67.2	χ^2=40.155	0.000
No	24	18	26	17	26	18.7	13	10	32	23.9		
No idea	45	33.8	25	16.2	21	15.1	22	16.9	12	9.0		
Q16: Inform the family of the HIV-positive patient about the disease.												
Yes	75	56.4	74	48.4	68	48.9	53	40.8	36	26.9	χ^2=38.232	0.000
No	28	21.1	39	25.5	42	30.2	38	29.2	66	49.3		
No idea	30	22.6	40	26.1	29	20.9	39	30	32	23.9		
Q17: HIV-positive dentists should not be allowed to work.												
Yes	25	18.8	24	15.7	19	13.7	19	14.6	8	6.0	χ^2=44.571	0.000
No	54	40.6	73	47.7	80	57.6	71	54.6	105	78.4		
No idea	54	40.6	56	36.6	40	28.8	40	30.8	21	15.7		
Q18: Do you subject the dental instruments you use on HIV-positive patients to various disinfection and sterilization procedures after use?												
Yes	112	84.2	111	72.5	94	67.6	101	77.7	119	88.8	χ^2=33.482	0.000
No	7	5.3	24	15.7	27	19.4	22	16.9	13	9.7		
No idea	14	10.5	18	11.8	18	12.9	7	5.4	2	1.5		
Q20: Would you like to attend meetings or training sessions to update your knowledge about HIV/AIDS?												
Yes	123	92.5	143	93.5	131	94.2	127	97.7	127	94.8	χ^2=3.934	0.415
No	10	7.5	10	6.5	8	5.8	3	2.3	7	5.2		

Since more than one option was selected in Q19, it is not shown in the table; AIDS: Acquired immune deficiency syndrome; HIV: Human immunodeficiency virus.

DISCUSSION

Although AIDS, which has been causing serious health and socioeconomic problems since its discovery in the United States in 1980, has a lower prevalence in our country than in other countries, the fact that the number of cases has tripled since 2010 is currently a cause for concern.[1] In parallel with this increase, the number of dentists confronted with AIDS cases is also increasing day by day. Oral ulcers, extensive caries, and periodontal problems may occur during illness, and even dentists may be the first to suspect HIV/AIDS. Our study examined dental students' knowledge and attitudes about HIV/AIDS at different grade levels. The clinical picture that results from the presence of many pathogens that become susceptible to HIV infection in the host is called AIDS. When asked if HIV and AIDS are the same phenomenon, 50.5% of the participants answered "No". However, in the 2019 survey of dentists conducted by İnce, 69.8% answered "Yes" to a similar question.[6] In addition, in a study conducted in 2019, it was observed that most students who participated in the survey did not correctly answer the question about the detection of HIV positivity by blood tests, whereas in our study, we received mostly correct answers to a similar question.[8] This difference in rate may indicate that younger generations are more aware of the difference between HIV and AIDS and that awareness of HIV/AIDS has increased with the increased use of social media.

Comparing the correct answers to the HIV/AIDS vaccination/treatment questions in a survey involving students without health care training with surveys of dental students participating in our study and dentists participating in the İnce's study and found that the correct answers were quite inadequate.[6,9] In this study, the researcher stated that it is important to take the necessary precautions to improve the HIV/AIDS knowledge of students who do not have health education and to take the necessary precautions to educate them. One of the most striking findings of our study relates to the oral tissue changes caused by HIV/AIDS. To date, approximately 40 oral symptoms have been reported in association with HIV infection. Oral candidiasis is most common in AIDS patients due to suppression of the immune system. These lesions may be the first sign of HIV infection in most patients. This is followed by hairy leukoplakia, Kaposi's sarcoma, ulcerations, herpes simplex, papillomas, and periodontal disease.[10] Li et al. found that the majority of students had adequate knowledge of Kaposi's sarcoma, oral candidiasis, and oral hairy leukoplakia, which are the main oral symptoms of AIDS.[11] In a study conducted by Ryalat et al. with 3rd and 5th grade students, the option of oral candidiasis was found to be the most common oral symptom of HIV/AIDS in both groups.[12] We found that the participants in our study had inadequate knowledge about this topic. This is a very important finding because it may lead to overlooking potential HIV/AIDS patients. Moreover, the responses to the question about information on prophylactic use are not satisfactory because of possible transmission of HIV/AIDS. In accordance with this result, it can be said that education on HIV/AIDS prevention protocol is inadequate. This result is very important for dentists because penetrating injuries are very common during the treatment process. Dentists may avoid treating HIV-positive patients for fear of HIV transmission through blood and saliva. This is related to the lack of knowledge about the modes of transmission during treatment and the development of the disease. Increasing knowledge about HIV among dentists and dental students has led to an increased desire to treat HIV-positive patients.[7] In our survey, the most commonly cited routes of HIV transmission were "blood route, injection, and parenteral contact." In the study by Jain et al., among dental students, the percentage of those who believe that HIV-positive patients can transmit infection through saliva is 36.9%.[13] In the study by Ryalat et al., respondents agreed with the statement that the risk of infection after contact with the blood of an HIV-positive patient is very high.[12] Student agreement with the statement that contact with the saliva of an HIV-positive patient is highly infectious suggests that their knowledge of the modes of HIV transmission is inadequate. HIV has been isolated from saliva, but HIV transmission through saliva alone has not yet been reported. In addition, most students in our study agreed that all patients should potentially be considered HIV

positive. Similar results have been obtained in previous studies on this topic.[7,14] Many previous studies have questioned the treatment attitudes of students toward HIV-positive patients, and it was found that the majority of participating students were positive about treating HIV-positive patients.[7,11,12] However, the acceptance rate of students participating in our study is lower than that of students participating in other studies. World Health Organization has stated that all dentists must treat HIV patients since 1988. From an ethical perspective, dentists are responsible for the care of patients with infectious diseases. The concern of dentists and students to be infected with HIV may hinder the practical and theoretical treatment of infectious diseases and related problems. It was found that the majority of students agreed that HIV can be transmitted during dental treatment. Parallel results have been found in other survey studies on this topic.[1,8,11] The results of this study should be interpreted with caution because of low willingness to treat HIV/AIDS patients. Students' knowledge about HIV needs to be improved in order to change their future attitudes and eliminate discrimination against those infected with HIV/AIDS.

CONCLUSION

Due to the increase in the number of HIV/AIDS patients in our country and in the world, and the extension of life through effective treatments, it is a reality that dentists will encounter these patients more and more frequently due to oral and dental health problems. For this reason, it is becoming more and more important every day to improve the level of knowledge of dental students about this disease and change their wrong attitudes. The number of participants in the survey we conducted is higher than other surveys on this topic.[6-8,11,12] Therefore, we believe the results are more informative. Although most of the students who participated in our survey had a largely correct knowledge about HIV/AIDS, some questions regarding their attitudes seemed to need improvement. No significant difference was found between preclinical and clinical students in their responses to either the knowledge or attitude questions. However, it appears that the higher the grade level and the more experience working with patients in the clinic, the higher the knowledge level and the lower the prejudice. As a result, regular training should be conducted to increase dental students' awareness of HIV/AIDS, and faculty curricula should be revised regarding this topic, as undergraduate courses are the most effective way to increase knowledge levels.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Candan Paksoy;* ***Design:*** *Candan Paksoy;* ***Control/Supervision:*** *Candan Paksoy;* ***Data Collection and/or Processing:*** *Candan Paksoy, Elif Polat;* ***Analysis and/or Interpretation:*** *Candan Paksoy, Elif Polat;* ***Literature Review:*** *Candan Paksoy, Elif Polat;* ***Writing the Article:*** *Candan Paksoy, Elif Polat;* ***Critical Review:*** *Candan Paksoy, Elif Polat.*

REFERENCES

1. Bulut ÖE. Diş hekimliği pratiğini ilgilendiren enfeksiyöz hastalıklar. Günaydın M, Saniç A, Gürler B, editörler. 4. Ulusal Sterilizasyon Dezenfeksiyon Kongresi. Ankara: Bilimsel Tıp Yayınevi; 2005. p.154-66. [Link]
2. Mehra B, Bhattar S, Bhalla P, Rawat D. Rapid Tests versus ELISA for screening of HIV infection: our experience from a voluntary counselling and testing facility of a tertiary care centre in North India. ISRN AIDS. 2014;2014:296840. [Crossref] [PubMed] [PMC]
3. Hsu DC, O'Connell RJ. Progress in HIV vaccine development. Hum Vaccin Immunother. 2017;13(5):1018-30. [Crossref] [PubMed] [PMC]
4. Pau AK, George JM. Antiretroviral therapy: current drugs. Infect Dis Clin North Am. 2014;28(3):371-402. [Crossref] [PubMed] [PMC]
5. Deeks SG, Overbaugh J, Phillips A, Buchbinder S. HIV infection. Nat Rev Dis Primers. 2015;1:15035. [Crossref] [PubMed]
6. İnce N. Diş Hekimlerinin HIV/AIDS ve oral lezyonlar hakkındaki bilgi düzeyi ve tutumlarının değerlendirilmesi [Evaluation of knowledge and attitudes of dentists about HIV/AIDS and oral lesions]. Konuralp Med J. 2019;11(2):202-7. [Link]
7. Singh VP, Osman IS, Rahmat NA, Bakar NAA, Razak NFNA, Nettem S. Knowledge and attitude of dental students towards HIV/AIDS patients in Melaka, Malaysia. Malays J Med Sci. 2017;24(3):73-82. [Crossref] [PubMed] [PMC]
8. Lorosa AH, Pereira CM, Hussne RP, Silva-Boghossian CM. Evaluation of dental students' knowledge and patient care towards HIV/AIDS individuals. Eur J Dent Educ. 2019;23(2):212-9. [Crossref] [PubMed]
9. Avcıkurt AS. Balıkesir Üniversitesi öğrencilerinin HIV/AIDS hakkındaki bilgi düzeyi ve tutumlarının değerlendirilmesi [Evaluation of knowledge and attitudes on HIV/AIDS of Balıkesir University student]. Balıkesir Health Sci J. 2014;3(2):79-86. [Link]
10. Cangül S, Adıgüzel Ö, Erpaçal B, Sonkaya E, Tekin S, Satıcı Ö. Evaluation of dentists' and dentistry faculty students' knowledge about HIV/AIDS and approaches to the HIV/AIDS patients. Selcuk Dent J. 2020;7(2):273-9. [Link]
11. Li R, Dong W, He W, Liu Y. Chinese dental students' knowledge and attitudes toward HIV/AIDS. J Dent Sci. 2016;11(1):72-8. [Crossref] [PubMed] [PMC]
12. Ryalat ST, Sawair FA, Shayyab MH, Amin WM. The knowledge and attitude about HIV/AIDS among Jordanian dental students: (Clinical versus pre clinical students) at the University of Jordan. BMC Res Notes. 2011;4:191. [Crossref] [PubMed] [PMC]
13. Jain M, Mathur A, Kumar S, Dagli R, Prabu D, Kulkarni S. Knowledge and attitude among dental students of Udaipur, India towards HIV/AIDS. J Oral Health Community Dent. 2008;2(2):30-5. [Crossref]
14. Lee C, Fan Y, Starr JR, Dogon IL. Dentists' and dental students' attitudes, knowledge, preparedness, and willingness related to treatment of people living with HIV/AIDS in China. J Public Health Dent. 2017;77(1):30-8. [Crossref] [PubMed]