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Evaluation of Knowledge About HIV/Aids Patients Among Dental Students: Findings from Eastern Turkey*

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Abstract

Objective: *It is important that all dentists should have sufficient knowledge of HIV/AIDS patients, and their attitude should meet professional expectations. The purpose of this study was to evaluate Dicle University Dentistry students' knowledge levels and attitudes about HIV/AIDS.*

Methods: *353 students (353/561X 100= 63%) students that were divided into two groups as clinical (4th and 5th grades) and preclinical (1st, 2nd and 3rd grade) cohorts. The assessment was done using questionnaires consisting of four main topics voluntarily between the 2016-2017 academic years. Data analysis was performed using SPSS version 21 (SPSS Inc., Chicago, USA). When applicable, the data were assessed by t-test and Pearson correlation coefficient.*

Results*: The overall response rate to the questionnaire was 62.9 percent. It was noted that 89.99% of students knew HIV/AIDS could infect dental workers while 95.42% were well aware of the mode of transmission of HIV/AIDS. Despite their awareness that HIV patients may infect them, they were poorly informed about the procedure of protection. Also, the information about the oral manifestations of the patient was limited.*

Conclusion: *This study showed that dental students' knowledge in the east part of Turkey about HIV infection and prevention was not adequate.*

Keywords: AIDS, Attitudes, Dental students, HIV, Knowledge.

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Introduction

HIV/AIDS (Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome) is transmitted by body fluids (blood, semen, vaginal secretions, breast milk) is a serious health problem in the world.[1] According to Progress Report 2016 of The World Health Organization (WHO), while the average 36.7 (34.0-39.8) million people infected with HIV are living in the world, 1.1 million people died due to this disease in only 2015. While more than 95% of all HIV-infected cases are seen in developing countries, 80% of cases are seen in sub-Saharan Africa, South and South-east Asia.[2]

In Turkey, following the first HIV (+) case reported in 1985, HIV/AIDS notification was put on the list of notifiable diseases. In 1986, the circular on the screening of all blood and blood products for HIV was put into action, followed by serological tests that have begun in 1987. In 1994, HIV/AIDS notifications were systematized, and in 1996 the National AIDS Commission was established. While 3 cases were reported in 1985, the case number has increased to 21.520 by 31 December 2018. According to the Ministry of Health statement, from 1 January to 31 December 2018, 3.356 newly diagnosed cases included 83,6% males, and most of them 25 - 29 years. It was also noted that 15,8% of cases were foreigners. When the route of transmission is examined, it is known that 49.4% of the cases are sexually transmitted, and 70.8% of the reported cases of sexual transmission are heterosexual.[3]

Dental treatment operations often include blood and saliva that may contain a variety of bloodborne pathogens and microorganisms such as HIV. All dental health care specialists and staff in oral and dental health services fall into the high-risk category in terms of infection. During dental treatment operations, for ensuring effective clinical management against infections, increasing awareness of dental students (as dentists of the future) about infection control and transmission routes of HIV-AIDS is very important.[4-6]

In 1988, the obligation to treat HIV (+) patients by all dentists was declared by the World Health Organization (WHO).[7] According to this obligation, dentists cannot legally refuse to take these patients. Ethical responsibility, lack of knowledge, and concern about being infected with HIV are the most likely reasons to refuse to treat patients infected with HIV.[8] Therefore, it is important that all dental professionals should have adequate knowledge of HIV infection and patient management.[9,10]

HIV virus leading the host vulnerable to diverse types of antigens from bacteria, virus, fungi and protozoa. People suffering from HIV / AIDS exhibit clinically oral manifestations during the early stages of the disease. Therefore, these signs of oral cavity are extremely important for the

presumption for HIV infection. In fact, dentist may be the first health professionals to suspect of positivity. People living with HIV virus may have oral pathognomonic manifestations of AIDS, including oral candidiasis, hairy leucoplakia, Kaposi sarcoma, linear gingival erythema, necrotizing ulcerative gingivitis, necrotizing ulcerative periodontitis, and non-Hodgkin lymphoma. However, the most commonly diagnosed oral lesions are oral candidiasis and hairy leucoplakia, which most important indicators of infection by HIV.[2,9,10]

The purpose of this study was to evaluate and to compare Dicle University Dentistry Faculty clinical and preclinical students' knowledge of HIV/AIDS and its transmission and attitudes about related issues such as infection control regulations, ethical obligations, willingness to treat HIV-positive patients, fear of contracting HIV, and perceptions about HIV-positive patients.

Materials and Methods

The Ethics Committee of Dicle University approved the study protocol with numbers 2015-34 and dated 30 December 2015. This cross-sectional survey was carried out in Faculty of Dentistry, Dicle University, Diyarbakir, between the 2016-2017 academic year. A modified version of a self-administered anonymous questionnaire was used. This tool has been successfully tested.[11,12]

The dental curriculum in Turkey is five years. The total population of Faculty of Dentistry is 561 persons as clinical (4^{th} and 5^{th} grades = 215 students) and preclinical (1^{st}, $2^{nd,}$ and 3^{rd} graders = 346 students). Because our questionnaire was held on a voluntary basis, only 353 students (199 preclinical and 154 clinical) of the total 561 students participated as a volunteer in the survey study. The study population's expected number was a minimum of 229 (N: 561, Confidence level: 95%, with confidence interval +/- 5). The response rate was 62,92 %.

The questionnaire occurred from four main topics.

Section 1; Demographic information, which includes age, gender, and school year.

Section 2; Knowledge of HIV infection, transmission routes, and adequacy of their knowledge about HIV-positive patients (Table 1). The eighteen knowledge questions were answered using the options "Correct" and "Incorrect". Each correct answer was scored 2 points. Maximum score 36 (18 x 2 = 36) was translated as 100 percent. Scores were classified into four groups according to the mean percentage of correct answers: less than 25 percent (weak), between 25 and 50 percent (moderate), between 50 and 75 percent (good), and more than 75 percent (excellent).

Table 1. *Dental students who gave correct responses to knowledge statements about HIV/AIDS, by percentage of total respondents.*

HIV/AIDS patients can contaminate dental workers. (True)	**89.99**
HIV/AIDS patients can be diagnosed with oral manifestations. (True)	**60.85**
HIV infection can be transmitted through; blood or tissue transplantation, needle stinging or open wounds, sexual intercourse and from mother to fetus and with mother's milk. (True)	**95.42**
Saliva can be a vehicle for the transmission of AIDS. (False)	**31.99**
HIV is a virus that is extremely weak. Virus within blood, sperm, and vaginal fluid can remain viable up to 1 hour in the external environment. (True)	**24.92**
For the destruction of the virus in the infected items, it is sufficient that wait within diluted sodium carbonate (1:10) for 10 minutes. (True)	**21.99**
Western blot is a definite test for HIV/AIDS diagnosis. (True)	**29.71**
ELISA is a screening test for HIV infection. (True)	**52.14**
Hepatitis B is more communicable than HIV/AIDS. (True)	**75.13**
Infection control methods for hepatitis B provide adequate protection against the transmission of HIV. (True)	**30.07**
There is a lot of HIV in the saliva of HIV/AIDS patients. (False)	**25.49**
CPR in patients with AIDS can transmit HIV infection. (False)	**29.42**
All sterilization methods have cidal effects against HIV. (True)	**54.88**
HIV can transmit through sweating; skin touching; someone else's towel; shaking hands; kissing cheeks; food and beverage; sharing dish; pool and toilet use; to share the same house; to wear someone else's clothes. (False)	**48.7**
HIV can be transmitted through aerosols by handpieces. (False)	**33.9**
If the needle of HIV / AIDS patient sank into my hand, it is beneficial that immediately washing my hands with soap and water at least 20s, then alcohol-riding. (True)	**55.14**

Section 3; Oral manifestations of HIV / AIDS patients (Table 2). The answer section of these fifteen questions was 'yes' or 'no'.

Table 2. Dental students' knowledge about oral manifestations of AIDS, by percentage of total respondents

Oral manifestations	**Percentage**
Oral candidiasis	48.43
Major aphthous	10.54
Kaposi's sarcoma	33.9
Acute necrotizing ulcerative gingivitis	23.01
Severe periodontitis	39.82
Cytomegalovirus	5.12
Gingivitis	34.47
Xerostomia	22.22
Hairy leukoplakia	27.35
Salivary gland infection	28.69
Herpes zoster	10.82
Herpes simplex	18.85
Lichen planus	20.17
Condyloma	7.97
Papilloma	11.96

Section 4; Behaviors related to the treatment of HIV-positive patients, legal responsibilities, and willingness to treatment were asked (Table 3). Answers were taken according to the Likert scale (strongly agree, agree, neutral, disagree, and strongly disagree). The maximum score is 85 (17x5=85). Scores were classified into three groups: more than 75 percent (positive), between 50 and 75 percent (passive), and less than 50 percent (negative).

In the literature, many researchers confirmed the validity of this questionnaire.[1,4,7,8,10,11] This questionnaire was translated to Turkish, because it is a major education language in Turkey. Data analysis was performed using SPSS version 21. When applicable, the data were assessed by *t*-test and Pearson correlation coefficient. A p-value of <0.05 was considered statistically significant with the level of 95 percent confidence.

Table 3. Responses of dental students to questions about their attitudes toward HIV/AIDS patients, by the percentage of total respondents Attitudes Statement

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Treatment of HIV/AIDS patients means wasting national resources.	4.91	6.64	8.38	30.92	49.13
All dental patients should be considered potentially infectious.	35.36	43.47	6.37	11.3	3.47
If I know that my friend has HIV infection, I end the friendship.	4.04	5.78	16.47	34.1	39.59
Supporting HIV/AIDS patients improves community health.	41.9	41.04	9.24	4.91	2.89
Dentists with HIV/AIDS should not be allowed to treat patients.	8.4	13.33	20.57	31.3	26.37
HIV/AIDS patients should be treated in a separate ward.	34.39	42.77	10.11	9.82	2.89
A blood test should be taken for diagnosis of HIV infection in all dental patients.	23.69	43.93	19.07	11.84	1.44
I am morally responsible to treat HIV/AIDS patients.	32.36	43.64	14.73	6.06	3.17
HIV/AIDS patients can live with others in the same place.	19.94	47.39	18.78	10.69	3.17
I am not obligated to treat HIV/AIDS patients.	6.64	15.31	13.87	40.17	23.98
HIV/AIDS patients can lead a normal life.	26.08	51.59	12.46	8.4	1.44
I can safely treat HIV/AIDS patients.	17.34	39.59	32.65	8.09	2.31
I will treat HIV/AIDS patients.	20.8	44.5	25.14	5.78	3.75
My knowledge about infection control is enough to treat HIV/AIDS patients.	5.49	19.94	28.61	34.39	11.56
I worry about being infected with HIV by my patients.	15.02	51.44	19.65	10.98	2.89
I will do CPR if HIV/AIDS patients need it.	17.63	43.64	29.47	7.22	2.02
It is my right to know if my patients are infected by HIV.	66.86	25.58	4.36	2.61	0.58

Result

The overall response rate to the questionnaire was 62.9 % (353 from 561students). The results indicated that 56.4 % of the students were in preclinic. 43.6 % of the respondents of the surveys were female. The total mean knowledge score was 56.26 % (good knowledge), as 56.91 % for males and 55.44 % for females.

The knowledge scores of 5.3 %, 20.7 %, 62.6 %, and 11.4 % of the students were excellent, good, moderate, and weak, respectively. There was no statistically significant difference between male and female students (p-value > 0.05). The total rate of correct responses ranged from 2 to 28. The maximum value for the question "HIV infection can be transmitted through; blood or tissue transplantation, needle stinging or open wounds, sexual intercourse and from mother to fetus and with mother's milk" was 95.42 %; and the minimum value for the question "For the destruction of the virus in the infected items, it is sufficient to soak with diluted sodium carbonate (1:10) for 10 minutes" was 21.99 %.

Regarding oral manifestations, 48.43 % correctly identified oral candidiasis, 39.82 % severe periodontitis, and 34.47 % gingivitis (Table II). There were no significant differences between attitude scores by gender.

The results showed the overall mean attitude score was 50.91 % (passive attitudes; 50.95 % for males and 50.86 % for females), with the following distribution: 35.8 % positive, 61.8 % passive, and 2.6 % negative attitudes. In other words, only 2.6 % had professional attitudes. The attitudes score ranged from 0 to 80. The statement "It is my right to know if my patients are infected by HIV" obtained the higher positive attitude score, and the statement "Treatment of HIV/AIDS patients means wasting national resources" obtained the higher negative attitude score.

There were no significant differences (p-value > 0.05) between attitude scores by gender (Table III). According to the Pearson correlation coefficient, students with higher knowledge scores had more positive attitudes towards HIV/AIDS patients ($r=0.257$, $p<0.0005$). Our findings showed that there a significant correlation between the school year of the students and their level of basic knowledge ($r=0.368$, $p<0.0005$). It means that the more advanced students had a higher basic knowledge.

Discussion

The overall response number to this cross-sectional questionnaire was 353 dental students in our study, similar to the number of students participating in studies in a previous survey that was published by Alsamghan[12] (363 students), and Fotedar *et al.*[13], (164 students). 199 dental students in the preclinical years and 154 dental students in the clinical years responded to this survey.

Due to the increase in cases of HIV-infected patients, medical and dental care of these patients will increase[1,7,14], thus dental students and dentists will be required to improve their management ability of HIV.[15] The total mean knowledge (56.26 percent good) is less than the study of Sadeghi *et al.* (82.1 percent).[11] Also, Alsamghan reported a slightly higher score (62.7) than our findings.[12]

The findings showed that there a significant correlation between the school year of the students and their level of basic knowledge ($r=0.368$, $p<0.0005$). It means that the more advanced students had a higher basic knowledge.

In the current study, the statement "HIV infection can be transmitted through; blood or tissue transplantation, needle stinging or open wounds, sexual intercourse and from mother to fetus and with mother's milk" had the highest percentage of correct responses (95.42 percent). Sadeghi *et al.*[11], and Fotedar[13] also reported one of the highest percentages of correct responses to this knowledge question. Al- Salihy *et al.*[16] showed health care workers in Iraq have a good level of knowledge about vertical transmission of disease. Also, the statement "For the destruction of the virus in the infected items, it is sufficient that wait within diluted sodium carbonate (1:10) for 10 minutes" had the lowest percentage of correct responses (21.99 percent) by dental students. This indicated that students know that HIV / AIDS patients may contaminate themselves, and unfortunately, they do not know how to protect from it.

31.99 percent of students stated that "Saliva can be a mode for the transmission of AIDS"; 25.49 percent of students thought that "There is a lot of HIV in the saliva of infected patients". 29.42 percent believed that "CPR in patients with AIDS can transmit HIV infection". In the literature, there is no report of transmission with saliva in the clinic due to the infectivity of HIV is inhibited by glandular saliva function.[17] But almost half of the students believe that saliva may transmit the virus, and most of them do not know that it is a weak virus and sensitive to sterilization and disinfection processes. Therefore, most of the students (66.46%) worry about being infected with HIV by patients.

Oral manifestations are important indicators of some systemic diseases. One of them is HIV infection. Therefore, dentists have a critical responsibility to detect HIV infection. The most common oral manifestations are Kaposi's sarcoma, oral candidiasis, and oral hairy leukoplakia.[18-20] Relationships of HIV and oral candidiasis, severe periodontitis, and gingivitis were known by the students; 48.3 percent, 39.82 percent, 34.47 percent, respectively. Although it is one of the most common oral manifestations of the HIV, only 33.9 percent of the students were aware of the relationships between HIV and Kaposi's sarcoma. In this study, the dental students' knowledge of

oral manifestations of HIV infection is less compared to Iranian, Indian, and Saudi Arabia dental students' knowledge, as reported by Sadeghi *et al.*[11], Awad[12] and Fotedar *at el.*[13].

In our study, the overall attitude score was 50.91 percent, which is comparable to the study reported by Sadeghi *et al*. (57.4 percent)[11] and Fotedar *et al*. (65.6)[13]; however, it was less than the results of Seacat *et al.*[21] (81.1 percent). According to the results of Albujeer *et al.*[22], the level of attitude of Iraqi dentistry students was 21.4%, which was also intermediate, and none of them occupied the "good" attitude category. Al- Salihy *et al.*[16] also showed the same result among Iraqi health care workers. This result was well below the data of our study.

In the current study, 77.16% of students stated that "HIV/AIDS patients should be treated at a separate ward"; 56.93 percent of students stated that "I can safely treat HIV/AIDS patients". 65.3 percent responded that "I will treat HIV/AIDS patients" in this study, but Sadeghi *et al*. (11) reported only 11.6 percent and one previous study.[23] However, at Albujeer *et al*.' s[22] study; the appropriate attitude rates to given the questions by Iraq dentistry students respectively are; 89% "Treatment of HIV/AIDS patients requires special dental clinics", 33% "One can safely treat HIV/AIDS patients", and 50% "I will be treating HIV/AIDS patients for elective treatment". According to these results, about half of Iraq dentistry students stated that they would treat HIV/AIDS patients, but they said that separate clinics are needed because they think they cannot safely treat HIV/AIDS patients. The current students, too, are afraid of cross-infection, they prefer to treat HIV/AIDS patients in a separate place; but most of them (65.3) are more willing to treat them.

In this study, 78.83% of students stated that each patient should be considered potentially infectious in this survey. This result was less than the results reported by Sadeghi *et al.*[11] (65.7 percent); although these findings are comparable to Fotedar *et al.*[13] (about one-third of the students). Some HIV/AIDS patients hide their illness from dental professionals due to fear of rejection of dental care, so this result is acceptable.[11] According to this statement, the Centers for Disease Control and Prevention declared that standard infection control preventions must be strictly followed with every patient for infection control.[24]

In this study, 21.95 % of the students stated that "I am not obligated to treat HIV/AIDS patients," which is less than the results of Sadeghi *et al*. (49.7 percent).[11] In 1988, the obligation to treat HIV-positive patients by all dentists was declared by the World Health Organization (WHO).[7] According to this obligation, dentists cannot legally refuse to take these patients. Also, 76 percent of the students stated that "I am morally responsible to treat HIV/AIDS patients". In this context, students

are aware of the ethical and moral responsibility of treating these patients; therefore, they only need to know more about the transmission of the disease, prevention methods, and oral manifestations.

In this survey, it was understood that students with higher knowledge scores had significantly more positive attitudes towards HIV/AIDS patients by Pearson correlation coefficient ($r=0.257$, $p<0.0005$). The findings of the present study were in line with the studies performed by several investigators who found that higher knowledge scores about HIV/AIDS among students were significantly associated with a more positive attitude to treat HIV-infected patients.[11,16,25] However, a previous study reported that there is no correlation between knowledge and attitude scores about HIV infection among students.[26] it was observed that there was no clear correlation between knowledge of HIV infection and the education year of the students. The expectation from this result was higher knowledge in the clinical group than preclinical group. This result was different than most of the other previous studies.[11,13,23] In our study, the reasons for this situation may be due to Turkey have a conservative society, and emotional reactions could play a significant role when answered the questionnaire.

Conclusion

This study showed that the knowledge of Eastern Turkey's dental students about HIV infection and prevention was not high. Especially, lack of some basic information such as Kaposi's sarcoma and transmission routes of HIV were some of the significant findings.

According to these findings regarding HIV-infected patients' management, they need to complete their knowledge and improve their attitudes. For example, students are well aware of how the HIV virus is transmitted but lacks knowledge of cleaning from contact surfaces. Also, lecturers should improve the dental school curriculum to prepare them for future dentists about HIV/AIDS patient management. Because this study showed that students with higher knowledge scores had more positive attitudes towards HIV/AIDS patients. The current study population did not represent the entire country. Fortunately, Diyarbakir is a developing and receiving heavily immigration city. For better results of knowledge and attitudes towards HIV/AIDS of dental students, similar further studies are needed in other dental schools in Turkey.

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Declaration of Interest

The authors have no conflicts of interest relevant to this article.

References

1. Cohen, L. A., Romberg, E., Grace, E. G., & Barnes, D. M. Attitudes of advanced dental education students toward individuals with AIDS, 2005. J Dent Educ 2005;69(8):896-900.
2. World Health Organization. Prevent HIV, Test and Treat All; Who Support for Country Impact: Progress Report 2016; p8. World Health Organization, Geneva, Switzerland (WHO/HIV/2016.24).
3. T.C. Ministry of Health. Turkey HIV / AIDS, Control Program (2019-2024). T.C. Ministry of Health, Turkey Public Health Center, Strategy Development Department, Ankara, Turkey. 2019; p10-12.
4. Hu SW, Lai HR, Liao PH. Comparing dental students' knowledge of and attitudes toward hepatitis B virus, hepatitis C virus, and HIV-infected patients in Taiwan, 2004. AIDS Patient Care STDS 2004;18(10):587–93.
5. Askarian M, Mirzaei K, Assadian O. Iranians' attitudes about possible human immunode ciency virus transmission in dental settings, 2007. Infect Control Hosp Epidemiol 2007;28(2):234-7.
6. Division of HIV/AIDS Prevention Maximizing Impact. DHAP Annual Report 2012. Centers for Disease Control and Prevention National. 2013, Atlanta, GA.
7. Oliveira ER, Narendran S, Falcao A. Brazilian dental students' knowledge and attitudes towards HIV infection, 2002. AIDS Care 2002;14(4):569-76.
8. McCarthy GM, Koval JJ, MacDonald JK. Factors associated with refusal to treat HIV-infected patients: The results of a national survey of dentists in Canada, 1999. Am J Public Health 1999;89(4):541-5.
9. Erasmus S, Luiters S, Brijlal P. Oral Hygiene and dental student's knowledge, attitude and behavior in managing HIV/AIDS patients, 2005. Int J Dent Hyg 2005;3(4):213-7.
10. Pagliari AV, Garbin CA, Garbin AJ. HIV attitudes and practices among professors in a Brazilian dental school, 2004. J Dent Educ 2004;68(12):1278-85.
11. Sadeghi M, Hakimi H. Iranian dental students' knowledge of and attitudes towards HIV/AIDS patients, 2009. J Dent Educ 2009;73(6):740-5.
12. Alsamghan, Awad S. Knowledge and attitude of male dental students toward HIV/AIDS in King Khalid University, Saudi Arabia, 2012. International Journal of Public Health and Epidemiology. 2012;1(1): 001-9.
13. Fotedar, S., Sharma, K. R., Sogi, G. M., Fotedar, V., & Chauhan, A. Knowledge and attitudes about HIV/AIDS of students in H.P. Government Dental College and Hospital, Shimla, India, 2013. J Dent Educ 2013;77(9):1218-24.
14. Kitaura, H., Adachi, N., Kobayashi, K., & Yamada, T. Knowledge and attitudes of Japanese dental health care workers towards HIV-related disease, 1997. J Dent 1997;25(3-4):279-83.
15. Darling M, Arendorf T, Samaranayake LP. Oral care of HIV-infected patients: the knowledge and attitudes of South African dentists, 1992. J Dent Assoc S Afr 1992;47(9):399-402.
16. Al-Salihy SR, Enad OM. Knowledge and attitude of health care workers in Baquba Teaching Hospital toward HIV/AIDS infection. Iraqi Journal of Public Health. 2017 Sep 20;1(2):42-6
17. Borsum KM, Gjermo PE. Relationship between knowledge and attitudes regarding HIV/AIDS among dental school employees and students, 2004. Eur J Dent Educ 2004;8(3):105-10.
18. Tappuni AR, Fleming GJ. The effect of antiretroviral therapy on the prevalence of oral manifestations in HIV-infected patients: a UK study. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2001;92(6):623-628.
19. Barr CE. Oral diseases in HIV-1 infection, 1992. Dysphagia 1992;7(3):126-37.
20. Classification and diagnostic criteria for oral lesions in HIV infection. EC-Clearinghouse on Oral Problems Related to HIV Infection and WHO Collaborating Centre on Oral Manifestations of the Immunodeficiency Virus. J Oral Pathol Med 1993;22(7):289-91.

21. Seacat JP, Inglehart MR. Education about treating patients with HIV infections/AIDS: the student perspective, 2003. J Dent Educ 2003;67(6):630-40.
22. Albujeer AN, Shamshiri AR, Taher A. HIV/AIDS awareness among Iraqi medical and dental students. Journal of International Society of Preventive & Community Dentistry. 2015 Sep;5(5):372.
23. Aggarwal A, Panat SR. Knowledge, attitude, and behavior in managing patients with HIV/AIDS among a group of Indian dental students, 2013. J Dent Educ 2013;77(9):1209-17.
24. Guide to Infection Prevention for Outpatient Settings: Minimum Expectations for Safe Care. CDC. Version 2.3 / September 2016.
25. Shan V, Shethwala ND, Bala DV. Knowledge, attitude and health behavior of dental students towards HIV patients, 2011. Healthline, Journal of Indian Association of Preventive and Social Medicine 2011;2(1):58-60.
26. Patil P, Sreenivasan V, Goel A. Knowledge of HIV/AIDS and attitude of dental students towards HIV/AIDS patients: A cross-sectional survey, 2011. Journal of Education and Ethics in Dentistry 2011;1(2):59-63.