

KNOWLEDGE, ATTITUDE, AND AWARENESS OF DENTAL UNDERGRADUATE STUDENTS REGARDING HUMAN IMMUNODEFICIENCY VIRUS/ACQUIRED IMMUNODEFICIENCY SYNDROME PATIENTS

RESHMA RAHMAN¹, SANTHOSH KUMAR MP^{2*}

¹Department of Oral and Maxillofacial surgery, Saveetha Dental College, Chennai, Tamil Nadu, India. ²Department of Oral and Maxillofacial Surgery, Saveetha Dental College and Hospital, Chennai, Tamil Nadu, India. Email: santhoshsurgeon@gmail.com

Received: 24 January 2016, Revised and Accepted: 13 February 2017

ABSTRACT

Objective: The aim of the study was to assess the knowledge, awareness, and attitude of dental students toward human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) patients and to know whether knowledge has any influence on the attitude and willingness to treat HIV/AIDS patients.

Methods: A self-administered, structured questionnaire consisting of 19 questions on knowledge, attitude, and awareness about HIV/AIDS was distributed among 100 students randomly belonging to 3rd year, final year, and intern of Saveetha Dental College, Saveetha University, Chennai. The data extracted were tabulated and statistically analyzed using SPSS Version 20.0, and the results were obtained.

Results: The results revealed that many of the respondents demonstrated a good level of knowledge. The total mean knowledge score was 73% (good knowledge). There was a statistically significant difference of knowledge levels among the 3rd-year and final-year students and the interns. The overall mean attitude score was 62.7% (negative attitude). There was no statistically significant difference of attitude among the three groups.

Conclusion: Majority of dental students in our study have good level of knowledge regarding HIV/AIDS. Final-year students had the highest level of knowledge, and 3rd-year students had minimum level of knowledge regarding HIV/AIDS. Irrespective of the year of study, majority of the students showed a negative attitude toward HIV/AIDS patients and only a few among the interns showed a positive approach toward treating HIV patients. Hence, these findings imply that there is a need to improve educational methods to more clearly address misconceptions and attitudes toward the disease.

Keywords: Human immunodeficiency virus/acquired immunodeficiency syndrome, Knowledge, Attitude, Dental students.

© 2017 The Authors. Published by Innovare Academic Sciences Pvt Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>) DOI: <http://dx.doi.org/10.22159/ajpcr.2017.v10i5.17277>

INTRODUCTION

Human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS) is a globally emerging public health problem. It has profoundly affected every aspect of the public health sector [1]. Since the first report on HIV and consequently AIDS which appeared in the early 1980s, new infections have developed despite continued prevention education efforts. The AIDS epidemic generated discrimination and prejudice toward HIV-infected patients. The possibility of HIV transmission in the oral health care is rare if proper precautions are taken [2]. During most dental therapeutic procedures, blood and saliva are often involved, which may contain infectious pathogens and microorganisms. Although there is a small chance of HIV transmission during dental procedures, many dentists are reluctant to treat HIV patients. The reason may be ignorance of HIV-related knowledge and to treat an HIV- positive individual. Some research indicates that as the knowledge of HIV increases, the willingness to treat HIV patients may also increase [3].

Nonetheless, the oral health care environment has become a helpful setting for early detection as most of the lesions of HIV infection are present orally during the first stage of the disease. Willingness to treat patients with HIV appears to be related to knowledge of the disease process, its oral manifestation, and modes of transmission, thus influencing health workers' attitudes and behavior toward the management of HIV/AIDS patients. With improved survival rates due to the success of antiretroviral therapies, it is expected that more HIV-positive patients will require increasingly competent and compassionate

health care, including oral care, in the near future. It is important for dental students to improve their knowledge to enable diagnosis and management of HIV/AIDS patients to have a more positive attitude toward these patients. Furthermore, as their knowledge improves, dental students may understand methods of infection control and how to prevent HIV transmission [4].

The purpose of the present study was to assess the dental undergraduate students' knowledge of HIV/AIDS and their attitude toward and willingness to treat patients with HIV/AIDS. Further, the influence of knowledge of HIV/AIDS on the attitude and willingness to treat HIV/AIDS patients was also studied such as ethical obligations and willingness to treat HIV patients.

METHODS

A cross-sectional study was conducted during the academic year in November 2016 among the undergraduate dental students of Saveetha Dental College, Saveetha University, Chennai. Ethical approval was obtained from the Institutional Ethical Committee. One hundred students were randomly enrolled in the study including 3rd-year, final-year, and intern students. All students in the study voluntarily completed the questionnaire consisting of 19 close-ended questions. The questionnaire included 13 knowledge and awareness-related questions and 6 attitude-related questions to assess the knowledge, awareness, and attitude of dental students toward HIV/AIDS patients. These questions were pretested for reliability and validity.

Questionnaire: knowledge, attitude, and awareness of dental undergraduate students regarding HIV/AIDS patients

Attitude-related questions

1. Do you willingly treat a patient if your patient is HIV positive?
 - Strongly agree
 - Agree
 - Neutral
 - Disagree
 - Strongly disagree.
2. Treating an HIV positive is ethical responsibility of a dentist.
 - Strongly agree
 - Agree
 - Neutral
 - Disagree
 - Strongly disagree.
3. Treating an HIV patient places a dentist at an increased risk of HIV infection.
 - Strongly agree
 - Agree
 - Neutral
 - Disagree
 - Strongly disagree.
4. The fear among dentists toward patients with HIV or AIDS can be hindrance in providing dental care to HIV patients.
 - Strongly agree
 - Agree
 - Neutral
 - Disagree
 - Strongly disagree.
5. Infection control procedures necessary for treating HIV patients are time-consuming and may affect the work quality of a dentist.
 - Strongly agree
 - Agree
 - Neutral
 - Disagree
 - Strongly disagree.
6. Do you think routine dental care should be a part of the treatment of a patient with HIV/AIDS?
 - Strongly agree
 - Agree
 - Neutral
 - Disagree
 - Strongly disagree.

Knowledge and awareness-related questions

7. Risk of HIV contagion is high; hence, special precautions have to be followed to treat HIV patients.
 - Yes
 - No.
8. Patients with HIV infection can lead a normal life.
 - Yes
 - No.
9. HIV infection can spread by touching.
 - Yes
 - No.
10. Saliva can be a vehicle for transmission of HIV infection.
 - Yes
 - No.
11. HIV patients can be identified by physical appearance.
 - Yes
 - No.
12. Needle prick injury can transmit HIV.
 - Yes
 - No.
13. Aerosols from handpiece can be a vehicle for transmission of HIV.
 - Yes
 - No.
14. ELISA/TRIDOT tests are screening tests for HIV.
 - Yes
 - No.

15. Western blot is a confirmatory test for HIV.
 - Yes
 - No.
16. HIV patients can be suspected from oral manifestations.
 - Yes
 - No.
17. Which host defense cells are primarily affected by AIDS?
 - Macrophages
 - B-lymphocytes
 - T-lymphocytes
 - Do not know.
18. If an individual is demonstrated to carry anti-HIV antibodies, they are;
 - Definitely suffering from AIDS
 - Immune to HIV infection
 - An HIV carrier
 - Do not know.
19. What is the average time interval between contracting HIV and the production of antibodies to it?
 - 6-12 weeks
 - 13-24 weeks
 - 24 weeks to 5 years
 - Do not know.

For the 13 knowledge-related questions, a score of 1 was assigned for every correct answer and a score of 0 for every incorrect answer. Total score of 75% and above, between 50% and 75%, between 25% and 50%, and score <25% was considered as excellent, good, moderate, and weak knowledge, respectively. For the 6 attitude-related questions, the response was rated to five-point Likert scale of strongly agree, agree, neutral, disagree, and strongly disagree. The scores were computed from five to one for a positive attitude and inversely for negative attitude. A score of 75% and above, between 50% and 75%, and <50% was considered as positive, negative, and passive attitude, respectively. Data were collected, statistical analyses for knowledge, attitude, and awareness and descriptive statistics were computed, and results were obtained. Data management and statistical analysis were performed using the statistical software SPSS version 20.0. The data obtained were analyzed using ANOVA test and *post hoc* tests.

RESULTS

The survey was conducted on 100 dental students, of them 27 were 3rd-year students, 39 from final year, and 34 were doing internship. The total mean knowledge score was 73% (good knowledge), and according to the year of study, it was 59.2%, 81.2%, and 75% for 3rd years, 4th years, and interns, respectively (Table 1). Majority of the final years and interns showed excellent knowledge about HIV/AIDS as compared to 3rd years who had knowledge categorized as good (Table 2a and b).

25.9% of the 3rd years showed moderate knowledge, and among final years and interns, 10.3% and 8.8% showed moderate knowledge on the topic, respectively. 74.1% of the 3rd years showed good knowledge. 28.2% and 38.2% of the final years and interns showed good knowledge, respectively. 61.5% of the final years and 52.9% of the interns showed excellent knowledge whereas none of the 3rd years showed an excellent knowledge on the topic (Table 2a). The results were statistically significant between the groups (Table 2b). Table 3 shows the correct responses for the entire survey. Table 4 shows percentage of correct responses for knowledge-related questions. Comparison of knowledge levels between groups is shown in Tables 5-7.

Table 1: Mean knowledge score

3 rd -year students	Final-year students	Interns
59.26%	81.28%	75%

**Table 2a: Knowledge score level of knowledge and awareness *
year crosstab**

Level of knowledge and awareness	Year			Total
	3 rd year	4 th year	Intern	
Moderate				
Count	7	4	3	14
% within year	25.9	10.3	8.8	14.0
Good				
Count	20	11	13	44
% within year	74.1	28.2	38.2	44.0
Excellent				
Count	0	24	18	42
% within year	0.0	61.5*	52.9*	42.0
Total				
Count	27	39	34	100
% within year	100.0	100.0	100.0	100.0

Table 2b: Chi-square tests

Correlation	Value	df	Asymptotic significant (2-sided)
Pearson Chi-square	27.656 ^a	4	0.000
Likelihood ratio	37.438	4	0.000
Linear-by-linear association	13.643	1	0.000
Number of valid cases	100		

^a2 cells (22.2%) have expected count<5. The minimum expected count is 3.78

Table 3: Correct responses

Year	3 rd years (%)	Final years (%)	Interns (%)
Knowledge	69.2	81.6	77.3
Attitude	32.7	35	40.6

Table 4: Knowledge of HIV/AIDS (correct responses)

Questions	Third years (%)	Final years (%)	Interns (%)
Risk of HIV contagion is high hence special precautions have to be followed to treat HIV patients	55.6	84.6	64.7
Patients with HIV infection can lead a normal life	74.1	82.1	70.6
HIV infection can spread by touching	81.5	92.3	97.1
Saliva can be a vehicle for transmission of HIV infection	33.3	76.9	67.6
HIV patients can be identified by physical appearance	37	64.1	82.4
Needle prick injury can transmit HIV	66.7	76.9	79.4
Aerosols from handpiece can be a vehicle for transmission of HIV	25.9	79.5	17.6
ELISA/TRIDOT tests are screening tests for HIV	74.1	74.4	88.2
Western blot is a confirmatory test for HIV	70.4	92.3	91.2
HIV patients can be suspected from oral manifestation	74.1	89.7	91.2
Which host defense cells are primarily affected by AIDS?	74.1	48.7	73.5
If an individual is demonstrated to carry anti-HIV antibodies, they are	66.7	61.5	55.9
What is the average time interval between contracting HIV and the production of antibodies to it?	63	61.5	64.7

Table 5: Descriptives

Knowledge and awareness (%)							
Year	N	Mean±SD	Standard error	95% Confidence interval for mean		Minimum	Maximum
				Lower bound	Upper bound		
3 rd year	27	59.26±12.380	2.383	54.36	64.16	40	70
4 th year	39	81.28±19.759	3.164	74.88	87.69	40	100
Intern	34	75.00±14.822	2.542	69.83	80.17	40	90
Total	100	73.20±18.525	1.853	69.52	76.88	40	100

Oneway

Post hoc tests

The study showed that the overall mean attitude score was 62.7%, and according to the year of study, it was 61.4%, 61.6%, and 65% for 3rd years, final years, and internees, respectively (Table 8). Majority of the students showed negative attitude toward HIV patients. Only 11.8% of the students showed a positive attitude toward the HIV patients and those were only from the internees. 96.3% of the 3rd years showed a negative attitude. 100% of the final years and 88.2% of the internees showed a negative attitude. 3.7% of the 3rd years showed passive attitude, and none of the final years and internees showed passive attitude toward HIV patients (Table 9a). The results were not statistically significant between the groups (Table 9b). Frequencies and percentage of responses toward attitude are shown in Table 10. Comparison of attitude between groups is shown in Table 11-13.

DISCUSSION

In our study, majority of the students' knowledge scores were good or excellent; however, the willingness to treat HIV patients was nonprofessional. Final-year students and interns showed higher level of knowledge about HIV/AIDS as compared to 3rd-year students. These results are similar to findings reported by Sadhegi *et al.* [5] among Iranian dental students, Ryalat *et al.* [6] among Jordanian dental students, and Brailo *et al.* [7] among Croatian dental students. Several studies have shown that HIV/AIDS-related knowledge improves as one progress through the curriculum, and this improved knowledge has been correlated with improved and positive attitudes toward treating patients living with HIV/AIDS [8-10].

In the present study, a rather surprising fact indicated that only about 60% of the students knew the average time interval between HIV infection and detection of HIV antibodies in the blood and other fluids, which was similar to results from the study by Ryalat *et al.* [6]. In addition, there was considerable ambiguity as to whether an individual carrying HIV antibodies constitutes an HIV carrier. Disappointingly,

Table 6: ANOVA

Knowledge and awareness (%)					
Relation	Sum of squares	df	Mean square	F	Signification
Between groups	7904.917	2	3952.459	14.706	0.000
Within groups	26071.083	97	268.774		
Total	33976.000	99			

Table 7: Multiple comparisons

Knowledge and awareness (%) Tukey HSD						
(I) year	(J) year	Mean difference (I-J)	Standard error	Signification	95% Confidence interval	
					Lower bound	Upper bound
3 rd year	4 th year	-22.023*	4.104	0.000	-31.79	-12.25
	Intern	-15.741*	4.226	0.001	-25.80	-5.68
4 th year	3 rd year	22.023*	4.104	0.000	12.25	31.79
	Intern	6.282	3.847	0.237	-2.87	15.44
Intern	3 rd year	15.741*	4.226	0.001	5.68	25.80
	4 th year	-6.282	3.847	0.237	-15.44	2.87

*The mean difference is significant at the 0.05 level

Table 8: Mean attitude score

3 rd years (%)	Final years (%)	Interns (%)
61.4	61.6	65

Table 9a: Attitude score level of attitude*year

Crosstab				
Level of attitude	Year			Total
	3 rd year	4 th year	Intern	
Positive				
Count	0	0	4	4
% within year	0.0	0.0	11.8	4.0
Negative				
Count	26	39	30	95
% within year	96.3	100.0	88.2	95.0*
Passive				
Count	1	0	0	1
% within year	3.7	0.0	0.0	1.0
Total				
Count	27	39	34	100
% within year	100.0	100.0	100.0	100.0

Table 9b: Chi-square tests

Correlation	Value	df	Asymptotic significant (two-sided)
Pearson Chi-square	10.740*	4	0.030
Likelihood ratio	11.523	4	0.021
Linear-by-Linear association	7.645	1	0.006
Number of valid cases	100		

*6 cells (66.7%) have expected count<5. The minimum expected count is 0.27

some students even thought that carrying anti-HIV antibodies indicated immunity against the disease. These results indicate that the dental students have inadequate knowledge of HIV virology and need substantial improvement in their education regarding the disease, which has also been reported in similar studies [11,12].

Administration of proper dental care to HIV/AIDS patients must be based on precise recognition of oral lesions associated with

HIV/AIDS. It is satisfactory that most students knew the relation between oral manifestations of HIV/AIDS. However, not every HIV patient has symptoms associated with the disease, such as Kaposi sarcoma, oral candidiasis, and oral hairy leukoplakia, and these classic oral manifestations may also be seen in patients not infected with HIV/AIDS. Taken together, these observations regarding the knowledge of HIV/AIDS indicate that dental students need to acquire additional knowledge concerning the disease.

Seacat *et al.* [13] in their study indicated that both knowledge of HIV and attributions of patient responsibility for illness were predictive of negative attitudes toward treatment. As knowledge levels increased, students showed positive attitudes in treating patient with HIV/AIDS, which is also demonstrated in the study by Sadhegi *et al.* [5]. Disappointingly, the majority of students (94.8%) in our study showed negative (nonprofessional) attitudes toward patients infected with HIV, with only 3.9% having a positive attitude. This is emphasized by the fact that more than half of the students in our study agreed or strongly agreed that there existed a high risk of HIV infection in everyday patient treatment. Kuthy *et al.* [14,15] demonstrated the importance of treating patients with HIV and the student willingness to treat these patients increased with clinical experience. Given that none of the students in this study had previous clinical experience, their attitudes and willingness may be improved as their clinical experience and related knowledge increases.

It is notable that 50% of the students were aware that treating HIV patients is their ethical responsibility, but then they refused to treat them. The findings of this study should be interpreted with caution since the level of willingness to treat HIV/AIDS-infected patients was low. In our study, the mean of students' knowledge about HIV/AIDS patients was good, but this knowledge was not significantly associated with the willingness to treat HIV/AIDS patients. Similarly, in a study in Iran [5], only 1% of dental students exhibited positive attitudes toward HIV/AIDS-infected patient treatment, meaning that professional attitudes on this subject remain poor despite the excellent/good knowledge of students. Furthermore, the fact that increased professional knowledge does not translate to acceptance of HIV/AIDS patients has also been shown in other studies [16-19].

Through increasing student knowledge about HIV, this study aims to change future doctors' attitudes and eliminate the discrimination against people infected with HIV/AIDS. Given these considerations, other educational methods should also be applied. It is possible that negative attitudes might change through face-to-face contact with

Table 10: Attitude toward and willingness to treat HIV/AIDS patients

Questions	3 rd years (%)	Final years (%)	Interns (%)
Do you willingly treat a patient if your patient is HIV positive?	7 (25.9)	13 (33.4)	13 (38.3)
Treating an HIV positive is ethical responsibility of a dentist	14 (51.8)	14 (35.9)	22 (64.7)
Treating an HIV patient places a dentist at an increased risk of HIV infection	4 (14.8)	13 (33.3)	14 (41.2)
The fear among dentists toward patients with HIV or AIDS can be hindrance in providing dental care to HIV patients	9 (33.3)	10 (25.6)	7 (20.6)
Infection control procedures necessary for treating HIV patients are time-consuming and may affect the work quality of a dentist	7 (25.9)	22 (56.4)	13 (38.2)
Do you think routine dental care should be a part of the treatment of a patient with HIV/AIDS?	12 (44.4)	10 (25.6)	15 (44.2)

Table 11: Descriptives

Attitude (%)							
Year	N	Mean±SD	Standard error	95% confidence interval for mean		Minimum	Maximum
				Lower bound	Upper bound		
3 rd year	27	61.48±6.293	1.211	58.99	63.97	50	73
4 th year	39	61.62±5.508	0.882	59.84	63.41	53	70
Intern	34	65.00±7.665	1.315	62.33	67.67	53	77
Total	100	62.73±6.656	0.666	61.41	64.05	50	77

Table 12: ANOVA

Attitude (%)						
Relation	Sum of squares	Df	Mean square	F	Significant	
Between groups	264.997	2	132.499	3.119	0.049	
Within groups	4121.225	97	42.487			
Total	4386.222	99				

Table 13: Multiple comparisons

Attitude (%) Tukey HSD							
(I) year	(J) year	Mean difference (I-J)	Standard error	Significant	95% confidence interval		
					Lower bound	Upper bound	
3 rd year	4 th year	-0.142	1.632	0.996	-4.03	3.74	
	Intern	-3.519	1.680	0.096	-7.52	0.48	
4 th year	3 rd year	0.142	1.632	0.996	-3.74	4.03	
	Intern	-3.376	1.529	0.075	-7.02	0.26	
Intern	3 rd year	3.519	1.680	0.096	-0.48	7.52	
	4 th year	3.376	1.529	0.075	-0.26	7.02	

people having a stigmatizing condition [20]. Therefore, efforts should be made to invite HIV/AIDS-infected people to colleges to talk to students about their illnesses. Furthermore, awareness should be created among the students regarding the benefits of anti-retroviral treatment when initiated at the earlier stages of the disease [21]. The limitation of the present study is that it did not include dental students from other institutions or other parts of the country or from other grades and the sample size was relatively small.

CONCLUSION

Majority of dental students in our study have good level of knowledge regarding HIV/AIDS. Final-year students had the highest level of knowledge and 3rd-year students had minimum level of knowledge regarding HIV/AIDS. Irrespective of the year of study, majority of the students showed a negative attitude toward HIV/AIDS patients and only a few among the interns showed a positive approach toward treating HIV patients. Hence, these findings imply that there is a need to improve educational methods to more clearly address misconceptions and attitudes toward the disease.

REFERENCES

- Arora DE, Dang RA, Kumar RA. Rising prevalence of opportunistic infections. *Int J Pharm Pharm Sci* 2012;4(2):1-2.
- Scully C, Greenspan JS. Human immunodeficiency virus (HIV) transmission in dentistry. *J Dent Res* 2006;85(9):794-800.
- Robert LM, Bell DM. HIV transmission in the health-care setting: Risk to health-care workers and patients. *Infect Dis Clin North Am* 1994;8:319-29.
- Tarantola A, Abiteboul D, Rachline A. Infection risks following accidental exposure to blood or body fluids in health care workers: A review of pathogens transmitted in published cases. *Am J Infect Control* 2006;34(6):367-75.
- Sadeghi M, Hakimi H. Iranian dental students knowledge of and attitudes towards HIV/AIDS patients. *J Dent Educ* 2009;73:740-5.
- Ryalat ST, Sawair FA, Shayyab MH, Amin WM. The knowledge and attitude about HIV/AIDS among Jordanian dental students: (Clinical versus preclinical students) at the university of Jordan. *BMC Res Notes* 2011;4:191.
- Brailo V, Pelivan I, Škaričić J, Vuletić M, Dulčić N, Cerjan-Leticia G. Treating patients with HIV and hepatitis B and C infections: Croatian dental students knowledge, attitudes, and risk perceptions. *J Dent Educ* 2011;75(8):1115-26.

8. Erasmus S, Luiters S, Brijal P. Oral hygiene and dental students knowledge, attitudes, and behaviour in managing HIV/AIDS patients. *Int J Dent Hyg* 2005;3:213-7.
9. Seacat JP, Inglehart MR. Education about treating patients with HIV infection/AIDS: The student perspective. *J Dent Educ* 2003;67(6):630-40.
10. Cohen LA, Romberg E, Grace EG, Barnes DM. Attitudes of advanced dental education students toward individuals with AIDS. *J Dent Educ* 2005;69(8):896-900.
11. Azodo C, Umoh A, Ezeja E, Ukpebor M. A survey of HIV related knowledge and attitude among dental nursing students in South Western Nigeria. *Benin J Postgrad Med* 2007;9:1-12.
12. Alsamghan AS. Knowledge and attitude of male dental students toward HIV/AIDS in King Khalid University, Saudi Arabia. *Int J Public Health Epidemiol* 2012;1(1):1-8.
13. Seacat JD, Litt MD, Daniels AS. Dental students treating patients living with HIV/AIDS: The influence of attitudes and HIV knowledge. *J Dent Educ* 2009;73:437-44.
14. Kuthy RA, Heller KE, Riniker KJ, McQuistan MR, Qian F. Students opinions about treating vulnerable populations immediately after completing community-based clinical experiences. *J Dent Educ* 2007;71(5):646-54.
15. Kuthy RA, McQuistan MR, Riniker KJ, Heller KE, Qian F. Students comfort level in treating vulnerable populations and future willingness to treat: Results prior to extramural participation. *J Dent Educ* 2005;69(12):1307-14.
16. Azodo CC, Ehigiator O, Oboro HO, Ehizele AO, Umoh A, Ezeja EB, *et al.* Nigerian dental students willingness to treat HIV-positive patients. *J Dent Educ* 2010;74(4):446-52.
17. Li R, Dong W, He W, Liu Y. Chinese dental students knowledge and attitudes toward HIV/AIDS. *J Dent Sci* 2016;11:72-8.
18. Rungsiyanont S, Lam-Ubol A, Vacharotayangul P, Sappayatosok K. Thai dental practitioners knowledge and attitudes regarding patients with HIV. *J Dent Educ* 2013;77(9):1202-8.
19. Borsum KM, Gjermo PE. Relationship between knowledge and attitude regarding HIV/AIDS among dental school employees and students. *Eur J Dent Educ* 2004;8:105-10.
20. Quartey JB. Impact of HIV on the practice of dentistry in Houston, Texas. *Tex Dent J* 1998;115(11):45-56.
21. Kolgiri V, Patil VW, Nagar V. Correlation of total antioxidant status (TAS) with DNA damage in HIV/AIDS patients. *Int J Pharm Pharm Sci* 2016;8(6):240-4.