Original Article

Knowledge and attitude of dental students toward HIV infection in Umm Al-Qura University, Saudi Arabia

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Abstract

Context: Immunodeficiency virus infection is a major health crisis. It can spread to other people by transmission of the body fluid. The knowledge about this viral infection can aid in preventing its transmission and help in delivering successful dental care to these patients. **Aims:** To evaluate the human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS)-related knowledge and attitude of dental students and also to compare knowledge and attitude between a student's gender and different clinical levels (second, third vs. fourth to seventh years). **Settings and Design:** A cross-sectional study was conducted among dental students at the college of dentistry in Umm Al-Qura University in Makkah, KSA. **Methods and Material:** A validated survey was sent electronically to dental students from the second year to seventh year. The questionnaire contained 12 knowledge and 13 attitude questions about treating HIV/AIDS patients. Descriptive statistics were presented for the knowledge and attitude of the dental students about HIV/AIDS. Also, the knowledge and attitude were compared using t-test in relation to gender and clinical year. **Results:** The response rate was 65%. The mean and standard deviation (SD) for the knowledge score was 8.32 ± 1.60 out of 12. There was no significant difference between gender and a student's clinical level. In the majority of the attitude questions, more than half of the students had favorable attitude toward HIV/AIDS subjects. Females had more favorable attitude as well as students with more clinical years of experience. **Conclusions:** Dental students showed acceptable knowledge and positive attitude toward HIV/AIDS patients. Students who were females and with higher clinical years demonstrated better attitude but similar knowledge to males.

Keywords: Attitudes, dental students, HIV/AIDS, immunodeficiency, knowledge

Introduction

Infection by human immunodeficiency virus (HIV) is a global public health concern. Disease control has dramatically improved in recent years; hence, individuals with HIV live a healthier life. Still, the immune system deteriorates, and lower resistances against many infections and even some types of cancer were observed among HIV subjects. Acquired immunodeficiency syndrome (AIDS) is the final stage of HIV infection. It can take several years to develop if not treated.[1]

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The main purpose of the study was to evaluate the HIV/AIDS-related knowledge and attitude of dental students and also to compare the knowledge and attitude between a student's gender and different clinical levels (second, third vs. fourth to seventh years).

Patients with HIV can visit all health care providers including primary care physicians, dentists, and auxiliary staff. Because all health care workers are at risk of contracting HIV, it is critical to assess all health care workers' knowledge and attitude toward HIV and its complications. Some health care providers, however, might be more exposed to risk of HIV transmission than others, partly because of the invasiveness of the procedures that can be performed.

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All health care staff are at risk of HIV infection. The risk of transmission of the virus from the patient to the health care worker is estimated to be 0.30% after a single percutaneous exposure to HIV-infected blood.[2] When compared with other health care providers, dentists have a lower risk of being infected with HIV because of the decreased amount of viral load in saliva, which contains anti-HIV activity.[3]

Globally in 2020, around 37.7 million subjects were infected with HIV/AIDS; 230,000 of them were in the Middle East and North Africa.[4] In Saudi Arabia, the total number of people living with HIV/AIDS was estimated to be 22,952 back in 2015.[5]

HIV spreads in a variety of ways including unprotected sexual intercourse, contaminated needles (mainly concerned with health care staff), tissue donation, and vertical transmission (a transmission from an infected mother to her baby at birth).[6]

There is an increased risk of stress, anxiety, and depression among HIV/AIDS subjects.[7] Infections by HIV can also affect a patient's nervous system with anticipated behavioral changes in their behavior.[8] Because of their HIV status, people living with HIV/AIDS (PLWHA) face significant stigma and discrimination around the world.[9-11] In 2008, a study of 90 countries found that one in four persons living with HIV reported some form of discrimination in health care settings. Furthermore, one in five individuals with HIV reported medical care denial.[12]

According to a study conducted in Jeddah, Saudi Arabia, the rate of discrimination against people living with HIV (PLWH) among dental practitioners was 67.4%. Some of the discriminatory attitudes reported by PLWH toward health care providers included irrelevant questions, uncomfortable interactions, over-use of precautions, refusal of care, unnecessary referrals, delay in treatment, confidentiality breaches, inadequate support, marking PLWH files to alert other health care providers, and fear of infection.[13]

HIV infection is well known to have a negative impact on oral health,[14,15] with 40% of HIV-positive individuals developing oral complications, oral candidiasis, Kaposi sarcoma, and necrotizing ulcerative periodontitis, which are some of the lesions.[14]

Fear of HIV infection or AIDS phobia among health care providers, including dentists, has been identified as a major barrier to successful delivery of dental care to PLWHA.[16,17] The willingness to treat HIV/AIDS patients among dental students appears to be related to their knowledge of the disease, recognition of oral manifestations, and understanding of the modes of transmission.[18] Appropriate knowledge about HIV also appears to be linked with lower levels of stigmatizing attitudes or negative predictors of stigma and discrimination among health care workers.[19,20] Therefore, to assess the adequacy of HIV/AIDS education in curricula, it is essential to gain insight into students' knowledge of HIV/AIDS and their attitudes about how to effectively treat HIV/AIDS patients.[21] The aim of this study was to evaluate the knowledge and attitudes of dental students and to compare HIV/AIDS-related knowledge and attitudes between males and females as well as pre-clinical and clinical students.

Materials and Methods

Study participants and sampling

This study was a cross-sectional survey. The study subjects consisted of dental students at the college of dentistry from the 2nd year to 6th year students as well as dental interns (completing 1 year of supervised clinical duties).

Study design and setting

The closed survey used in this study had a high degree of internal consistency and was adopted from a previous survey that was conducted among Iranians by Sadeghi, M., and Hakimi, H.[22] The survey was pilot-tested with around 30 convenient participants mostly to measure the duration of completion and for feedback on potential concerns in implementation. The online survey included four parts over four pages. The first part consisted of an introduction and giving consent on participation. Also, the duration required to complete the survey was shown in this part. The second and third parts consisted of 12 and 13 close-ended knowledge and attitude questions about HIV/AIDS, respectively. The last part asked about the gender and year of study.

The survey instrument was sent electronically via e-mails. The collected responses were stored on the survey website, encrypted using AES 256-based encryption.[23] Data were collected from Umm Al-Qura University dental students between February 28, 2021 and April 12, 2021. Each page of the survey cannot be passed until all items are completed; incomplete responses were still recorded and marked as incomplete. To prevent duplicate entries from the same user, links were closed after completing the survey and it could not be re-opened by the participant.

The number of students and e-mail addresses of the students were obtained from the academic office, college of dentistry. A unique survey tracked link was generated for each participant so that reminders were sent for non-respondents. There were a total of 332 students, 161 male and 171 female students and 101 pre-clinical and 231 clinical students.

Statistical analysis

The frequency and percentage of the responses were used to describe each knowledge and attitude question. The response to knowledge was coded as 0 for a wrong answer and 1 for a correct answer. The total knowledge variable was created by summing all 12 knowledge questions. The response to attitude questions was coded as 1 for 'Strongly disagree', 2 for 'Disagree', 3 for 'Neutral', 4 for 'Agree', and 5 for 'Strongly agree'. Reverse coding was used for question numbers 1, 3, 5, and 8. The total attitude variable was created by summing all 13 questions. Total knowledge and attitude were described using mean and standard

deviation (SD). A higher score indicated better knowledge and attitude. Also, the totals were compared between gender and clinical years using two-sample independent Student t-test. Analysis was performed on participants who completed the survey. A comparison was made between those who completed the survey and those who did not in relation to gender and clinical years. Pre-clinical years included second and third years, whereas the clinical years included fourth, fifth, and sixth years in addition to the internship year. All analyses were completed using STATA, version 15.1 (StataCorp LP, CollegeStation, Texas). A *P* value of 0.05 or less was considered statistically significant.

Ethical consideration

The procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975 and have obtained an ethical approval from an ethical committee.

Results

The response rate to the electronic survey was 65%. The frequency and percentage of correct response to each knowledge question are shown in Table 1. More than 90% of the participating students correctly responded to the following items: needle stick injury can transmit HIV, HIV/AIDS can infect dental workers, and medical workers had a higher risk for cross-infection. More than 80% of the students correctly answered the questions about diagnosing HIV/AIDS with oral manifestations, hepatitis B being more communicable than HIV/AIDS, and enzyme-linked immunosorbent assay (ELISA) being a screening tool for HIV. More than 60% of the participants knew about the meaning of a negative HIV test, saliva being a vehicle for transmission of AIDS, infection control measures, and the presence of large quantities of HIV in the saliva of HIV/AIDS patients. About 54% of the students correctly answered the question for definitive testing for HIV/AIDS. The lowest correct response, about 44%, was for sterilization methods.

Table 1: HIV/AIDS-related knowledge of dental students

Knowledge statement	Agree	Disagree
HIV/AIDS patients can infect dental workers	208 (96.30%)[a]	8 (3.70%)
HIV/AIDS patients can be diagnosed with oral manifestations	192 (88.89%)[a]	24 (11.11%)
Needle stick injury during dental treatment can transmit HIV	211 (97.69%)[a]	5 (2.31%)
Hepatitis B is more communicable than HIV/AIDS	184 (85.19%)[a]	32 (14.81%)
Medical staff are more prone for cross-infection	198 (91.67%)[a]	18 (8.33%)
The negative HIV tests surely indicate that the persons are free of viruses	84 (38.89%)	132 (61.11%)[a]
Western blot is a definite test for HIV/AIDS diagnosis	117 (54.17%)[a]	99 (45.83%)
ELISA is a screening test for HIV infection	181 (83.80%)[a]	35 (16.20%)
Saliva can be a vehicle for the transmission of AIDS	80 (37.04%)	136 (62.96%)[a]
Infection control methods for Hepatitis B provide adequate protection against the transmission of HIV	154 (71.30%)[a]	62 (28.70%)
There is a lot of HIV in the saliva of HIV/AIDS patients	67 (31.02%)	149 (68.98%)[a]
All sterilization methods have cidal effects against HIV	122 (56.48%)	94 (43.52%)[a]

[a]Correct response to the statement

For the attitude questions related to HIV/AIDS [Table 2], more than half of the students (62%) strongly disagreed or disagreed with the statement 'Treatment of HIV/AIDS patients means wasting national resources'. About 64.81% of the participating students considered dental patients as potentially infectious. Only 5% of the students were willing to end a friendship with an HIV friend. About 70% of the participants agreed or strongly agreed that HIV/AIDS patients were part of the community health. A little more than or around one-third of the subjects had a neutral view on the following: treating HIV/AIDS patients at a separate ward, moral responsibility to treat HIV/AIDS patients, obligation to treat HIV/AIDS patients, HIV/AIDS can live a normal life, being safe when treating HIV/AIDS patients, treating HIV/AIDS patients, and performing cardiopulmonary resuscitation (CPR) for HIV/AIDS patients. Only 39% agreed or strongly agreed that their knowledge was adequate to treat HIV/AIDS patients. The mean (standard deviation) for the total knowledge questions was 8.32 (1.60); the maximum possible score was 12. The mean was not significantly different (*P*-value = 0.13) between males (mean = 8.16 ± 1.66) and females (mean = 8.5 ± 1.53). Also, there was no significant difference (*P*-value = 0.175) between pre-clinical (mean = 8.52 ± 1.66) and clinical (mean = 8.21 ± 1.56) years. The mean (SD) score for the total attitude questions was 45.37 (7.02). Female students (mean score = 46.27) had slightly more favorable attitude (*P*-value = 0.05) toward HIV/AIDS than male students (mean = 44.4 ± 7.02). Students at the clinical years (mean score = 46.6 ± 7.38) had more favorable attitudes (*P*-value = 0.0006) toward HIV/AIDS patients compared to students who did not treat patients at the clinics (mean = 43.23 ± 5.78) [Table 3].

Discussion

The current study evaluated the knowledge and attitudes toward HIV/AIDS patients among dental students. The study included 332 students, 161 male and 171 female students, and 101 pre-clinical and 231 clinical students with a response rate of 65.17%.

Students' knowledge of HIV/AIDS patients was on average very good in our study, and this knowledge was also associated with a positive attitude. Dental students' knowledge and attitude were not significantly associated with gender or clinical stage unlike other previous studies.[24-28] The majority of students agreed that "HIV/AIDS patients can infect dental workers" in knowledge statements.

Table 2: Responses of dental students to HIV/AIDS-related attitude statements

Attitude statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Treatment of HIV/AIDS patients means wasting national resources[a]	69 (31.94%)	64 (29.63%)	60 (27.78%)	15 (6.94%)	8 (3.70%)
All dental patients should be considered potentially infectious	20 (9.26%)	13 (6.02%)	43 (19.91%)	51 (23.61%)	89 (41.20%)
If I know that my friend has HIV infection, I end the friendship[a]	116 (53.70%)	62 (28.70%)	27 (12.50%)	7 (3.24%)	4 (1.85%)
Supporting HIV/AIDS patients improves community health	12 (5.56%)	10 (4.63%)	43 (19.91%)	69 (31.94%)	82 (37.96%)
HIV/AIDS patients should be treated at a separate ward[a]	18 (8.33%)	36 (16.67%)	83 (38.43%)	56 (25.93%)	23 (10.65%)
I am morally responsible to treat HIV/AIDS patients	8 (3.70%)	30 (13.89%)	80 (37.04%)	70 (32.41%)	28 (12.96%)
HIV/AIDS patients can live with others in the same place	9 (4.17%)	33 (15.28%)	55 (25.46%)	78 (36.11%)	41 (18.98%)
I am not obliged to treat HIV/AIDS patients[a]	20 (9.26%)	59 (27.31%)	81 (37.50%)	39 (18.06%)	17 (7.87%)
HIV/AIDS patients can lead a normal life	3 (1.39%)	27 (12.50%)	67 (31.02%)	83 (38.43%)	36 (16.67%)
I can safely treat HIV/AIDS patients	13 (6.02%)	34 (15.74%)	72 (33.33%)	72 (33.33%)	25 (11.57%)
I will treat HIV/AIDS patients	12 (5.56%)	23 (10.65%)	68 (31.48%)	84 (38.89%)	29 (13.43%)
My knowledge about infection control is enough to treat HIV/AIDS patients	21 (9.72%)	51 (23.61%)	61 (28.24%)	55 (25.46%)	28 (12.96%)
I will perform CPR if HIV/AIDS patients need it	17 (7.87%)	24 (11.11%)	79 (36.57%)	66 (30.56%)	30 (13.89%)

Statements that were reversely scored (i.e., strongly agree, 1 point; strongly disagree, 5 points)

Table 3: Comparison of HIV/AIDS knowledge and attitude of students in relation to gender and clinical stage

	n (%)	Knowledge		*P*	Attitude		*P*
		Mean	SD		Mean	SD	
Gender							
Males	111 (51.39)	8.16	1.66	0.1268	44.4	7.02	0.0512
Females	105 (48.61)	8.50	1.53		46.27	6.92	
Clinical stage							
Pre-clinical	79 (36.57)	8.52	1.66	0.175	43.23	5.78	
Clinical	137 (63.43)	8.21	1.56		46.60	7.38	0.0006

SD: standard deviation. *P*-values were produced using the two-sample independent t-test

They also agreed that "Hepatitis B is more communicable than HIV/AIDS" and that "Medical staff are more prone to cross-infection," which demonstrated adequate knowledge that can be translated into infection control practices. More than half of the students disagreed that "Saliva can be a vehicle for the transmission of AIDS" and "There is a lot of HIV in the saliva of HIV/AIDS patients"; saliva exposure carries a much lower risk of transmission than blood exposure.[3] Only about half of the students agreed that "All sterilization methods have cidal effects against HIV,". This could be because of a lack of knowledge about the various methods of sterilization and their impact on the HIV.

The attitudes of dental students toward treating HIV/AIDS patients were found to be mostly positive. Previous studies showed similar findings with more favorable attitude in our study than studies performed in Iran and Taiwan.[22,29] Around 38% of the students agreed that they had enough knowledge about infection control to treat HIV/AIDS patients, which is similar to other studies that were performed in Nigeria and Malaysia.[18,28] The ability to treat infected patients safely, feeling moral responsibility, and believing that HIV/AIDS patients can live with others were all significant attitude factors associated with willingness to treat these patients.

The questionnaire used in this study was adopted from a prior study with high internal consistency.[22] The same questionnaire was also used in many previous studies.[24,25,29,30]

Although most of the dental students had a very good knowledge and were well prepared to manage patients clinically, it is critical that these students develop not only the necessary practical skills, such as infection control rules, but also attitudes toward preparing themselves to treat HIV/AIDS patients as future dentists. To achieve these goals, the dental school curriculum must be improved.

One of the limitations of the study was not evaluating the effect of social class, income, parental education, and residency area as variables to be examined. Another limitation was sampling only dental students from one dental school. Our findings were mostly in agreement with other studies conducted using various sample segments of the population including primary care providers[31] and among medical students.[32] Future research might include more than one dental study and/or other health care professionals. The response rate (65%) was reasonable but, arguably, could be increased by using more than one data collection method. Selection bias cannot be ruled out with studies relied upon voluntary participation.

Primary care providers should be equipped with the sufficient knowledge and tools to be able to practice safe medical care without needless exposure to infection. Dentists could be the first practitioners to refer a patient to a medical counterpart if they are well-versed in the oral manifestations of HIV and its modes of transmission. By doing so, the spread of HIV infection in a population can be better controlled. Although students in our study showed acceptable knowledge and a favorable attitude, additional training can achieve superior care. Moreover, inter-health profession collaboration and better communication are necessary to improve the care of HIV patients.

Conclusion

Students showed acceptable knowledge and favorable attitude toward treating subjects with HIV/AIDS. Female students and those with more clinical years showed more favorable attitude but parallel knowledge toward HIV/AIDS subjects.

Ethical approval

The study was approved by the biomedical ethics committee at Umm Al-Qura University, approval no. HAPO-02-K-012-2021-01-523.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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