

## Knowledge and attitude of post-graduate dentistry students regarding HIV-positive patients

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### Original Article

#### Abstract

**BACKGROUND AND AIM:** Human immunodeficiency virus (HIV) can cause a hazardous disease and has severe fatal consequences. The problem of dental treatment in affected patients has still remained a big debate. The objective of this study was to evaluate the knowledge and attitude of post-graduate dentistry students regarding treatment and education of HIV-positive patients.

**METHODS:** This was a cross-sectional descriptive study on the post-graduate students of dentistry in Iran. Samples were collected using consensus method. A valid questionnaire comprising three parts was designed according to previous studies. The questionnaire comprised of a demographic part, general questions and questions regarding knowledge and attitude of the subjects. Answers were collected and Student's *t*-test and Fischer's exact test was used to analyze the data.

**RESULTS:** A total of 380 subjects took part in this study (164 male, 216 female). There were 92 HIV-positive patients. The average score of knowledge was  $14.5 \pm 2.8$  (range = 0-24). The average score of knowledge in male and female participants was  $14.5 \pm 2.8$  and  $14.6 \pm 2.7$  respectively (range = 0-65). There was no significant relationship between knowledge and gender ( $P = 0.70$ ). The average score of attitude was  $44.8 \pm 5.25$  and male residents had a positive attitude in comparison to female residents. Male participants had a significantly more negative attitude toward high risk and HIV-positive patients compared to female residents ( $P = 0.04$ ).

**CONCLUSION:** The results of this study showed that post-graduate students had a positive attitude toward treatment of HIV-positive patients. Also, this study showed that post-graduate students had a good knowledge about the HIV-positive patients. This study shows that post-graduate students of dentistry were eager to learn more about the treatment of HIV-positive patients. Findings of this study also add new concepts to the oral hygiene maintenance of HIV-positive patients and decision making for them.

**KEYWORDS:** Knowledge; Attitude; Dentistry; Human Immunodeficiency Virus (HIV)

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There were over 33 million people affected by HIV at the end of 2012. One new case is added to this number every seven seconds and one person dies from this virus every 11 seconds. At the beginning, male homosexuals and drug abusers were the high risk subjects, but today, the population of HIV is changing

and the number of patients is increasing in other groups as well.<sup>1</sup>

The first case of HIV in Iran was reported in 1987. According to official data of the Iranian Ministry of Health, 67% of the patients are intravenous drug users and 9% are affected through sexual transmission. The major concern is the validity of these data and the

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danger of spreading the disease through different parts of the society. Iran's geopolitical location and its long border with Afghanistan and Pakistan which have a major role in production of world's heroine makes the situation even more complex and Iranian government is faced with the problem of drug transit plus the danger of drug abuse.<sup>1</sup>

According to World Health Organization (WHO) report, it is estimated that about 38 million people were HIV-positive by 2009 and 2.7 million new cases are reported each year.<sup>2</sup> Since the first diagnosis of HIV, 25 million people have died from this disease which affected a total of 63 million people till 2009.<sup>3</sup> The routes of HIV transmission are sexual contact, contaminated blood and blood products and vertically. Recent international studies have indicated that oral lesions (e.g. oral candidiasis and Kaposi sarcoma) occur in as many as 50 to 70 percent of all HIV/AIDS cases. These conditions, which may be preventable and/or treatable with regular dental care, often persist and lead to discomfort, dysfunction, and disability that, if left untreated, can significantly impede quality of life.<sup>4</sup>

Due to the fact that HIV can cause a hazardous disease and have severe fatal consequences along with its unresponsiveness to current medications, the problem of dental treatment in these patients still remains a big debate.

Oberoi et al. studied 427 dental student from India in 2014 and the willingness to treat HIV-positive patients among dental students was 67.0%, and 74.20% were confident about treating a patient with HIV.<sup>5</sup> Bennett et al. showed that 71% of the 671 studied dentists did not show a positive attitude to perform dental procedures for HIV-positive patients and most of the dentists referred high risk patients.<sup>6</sup> A similar result was obtained by Lewis et al., most of the dentists preferred not to work for HIV-positive patients and believed that these patients should be treated in tertiary special

clinics.<sup>7</sup> Studies have revealed two reasons for not working on HIV-positive patients: first, the risk of losing other patients due to accepting to work for HIV-positive patients and second, risk of disease transmission from patient to the dentist.<sup>7</sup>

Information regarding the differences in oral health maintenance and performing procedures on these patients or high risk subjects, and training of dental staff is an important issue which should be well addressed. American Dental Association (ADA) reports still emphasize on the importance of providing efficient oral health services and providing different services to the patients who do not receive enough care. The safety issues on treating these patients and the necessity to educate pre- and post-graduate students makes teaching them an important topic. The question that arises here is whether dental staffs are prepared to work for these patients and whether they are willing to treat them or not.<sup>8</sup>

Considering the safety of working for HIV-positive patients, the question is whether the students are appropriately prepared to work with these patients and whether they have received enough education about infection control and are ready to work for them or not. It is also noticeable that HIV-positive patients are considered as patients with special needs and it is preferable that an expert person works for them to minimize the risk of infection and time consumed to do the procedure. These facts highlight the role of post-graduate students in treatment of these patients. Curriculums of dental schools reveal that most of the education regarding treatment of HIV-positive patients is limited to an abstract introduction to the disease, oral manifestations and infection control in these patients.<sup>7,8</sup>

This study was designed to evaluate knowledge and attitude of Iranian post-graduate students about treating HIV-positive patients. It is noticeable that despite the fact that several studies have been conducted on students, people from general population and

prisoners,<sup>6,9-12</sup> a few studies have been done in dental schools<sup>6,12</sup> but none has addressed dentistry post-graduate students.

### Methods

This was a cross-sectional descriptive study performed on post-graduate students of dentistry in Iran (2012-2013). First, a questionnaire was designed according to previous studies.<sup>7,13</sup> The questionnaire comprised of a demographic part, general questions and questions regarding knowledge and attitude of the subjects. Validity of the questionnaire was evaluated by 10 specialists in Kerman, Iran. They were asked to express their opinion on each question by these phrases: totally appropriate, appropriate, no idea, inappropriate and totally inappropriate.

After evaluation by the specialists, comprehensibility of the questions was evaluated. In total, the questionnaire had 18 questions; three questions were inappropriate according to the experts' opinion and were excluded from the questionnaire. Therefore, validity of the questionnaire was good. Its overall validity was 79% and the validity coefficient (Cronbach's  $\alpha$ ) for each question was between 77-89 percent. Reliability of the questionnaire was 0.8 considered to be good.

The final questionnaire comprised of 28 questions plus demographic data (age, sex). The questionnaire was distributed by a senior student through email. Post-graduate Students of all dental schools in Iran (Isfahan, Tabriz, Tehran, Zahedan, Shahid Beheshti, Kerman, Shiraz, Mashhad, Shahed, Yazd, Azad University of Tehran, Khorasegan and Qazvin) were asked to fill the forms. Confidentiality was guaranteed and subjects were asked to freely express their opinion. Questionnaires were designed un-identified and un-addressed. To analyze the data, in knowledge section, for each correct answer, 2 scores were given, for each wrong answer 0 score and for not answering, 1 score was given (average = 0-24 scores).<sup>7,14</sup> To evaluate the attitude section, questions were designed

so that the answers were as totally agree, agree, no idea, disagree and totally disagree and a score of 5 to 0 was given to the answers subsequently (average = 0-65 scores). Fischer's exact test, Student's t-test, chi-square and regression test were used to analyze the data using SPSS (version 18.0, SPSS Inc., Chicago, IL, USA).

### Results

A total number of 420 questionnaires were emailed and 380 were filled by the subjects (overall response rate: 90.5%, male response rate: 89.1%, female response rate: 91.5%). One hundred sixty-four male (43.1%) and 216 female (56.9%) subject with the average age of  $28.5 \pm 4$  years participated in this study.

Regarding the question about previous treatment of HIV-positive patient, 24.3% ( $n = 92$ ; 42 women, 50 men) of the subjects answered yes and the other participants who said no declared causes such as not countering such a patient, fear of disease transmission and inability to fully control infection. No significant relationship was found between gender, age and treating HIV-positive patients ( $P = 0.09$  and  $P = 0.08$ , respectively). About 59% (155 subjects; 80 women and 75 men) had previously participated in educational programs regarding infection control principles in HIV-positive patients.

Table 1 shows the results of survey on attitude. The most positive answers (totally agree) were given to the questions 13, 4 and 7 and the most negative answers were given to questions 5, 10, 1 and 8. Maximum score of attitude section was 62 and minimum was 27 ( $44.8 \pm 5.25$ ). The average score of attitude in male participants was  $45.6 \pm 5.8$  and in female subjects, it was  $44.6 \pm 4.8$ .

Table 2 demonstrates the answers to attitude section based on gender. There was a significant positive relationship between positive answers to questions 5, 6 and 10 and gender. This study revealed that there was no significant relationship between attitude score and gender ( $P = 0.11$ ).

**Table 1.** Answers of post-graduate dentistry students to attitude questions

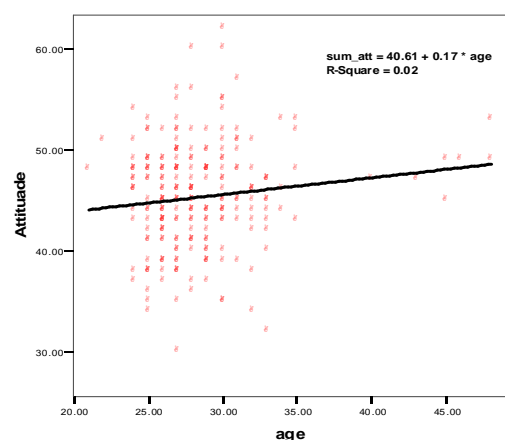
Number	Question	SA	A	NA-NDA	DA	SDA
1	Meeting an individual who is HIV-positive would influence my decision to treat HIV positive patients in the future.	47	138	74	77	43
2	Learning about persons from different backgrounds by being in a discussion group would be helpful.	43	195	87	40	24
3	Reading case reports from patients with infectious diseases would help me to be a better provider for these patients.	63	201	63	31	22
4	Treating an HIV positive patient with close clinical supervision would give me more confidence in treating these patients in the future.	108	183	37	28	26
5	Because of the level of risk involved in treating homosexual patients, I would prefer not to treat them.	33	86	84	130	48
6	Because of the level of risk involved in treating intravenous drug users, I would prefer not to treat them.	34	106	66	131	11
7	If it became revealed that patients with infectious communicable diseases are treated in a dental practice, some patients might leave the practice.	79	195	37	11	26
8	I am very concerned about contracting an infectious communicable disease from my patients.	47	107	69	120	37
9	I would prefer not to treat a patient who is currently using intravenous drugs.	37	92	74	134	11
10	I would prefer not to treat a patient who has a homosexual or bisexual orientation.	41	107	71	115	46
11	Dentists have a professional obligation to treat patients with HIV/AIDS.	72	170	73	39	26
12	I am currently working in a work environment where people with HIV are in the work place.	43	129	94	78	36
13	I think that drug addiction is a disease that needs to be treated.	111	176	41	32	20

SA: Strongly agree; A: Agree; NA-NDA: Neither agree nor disagree; DA: Disagree; SDA: Strongly disagree

There was a significant positive relationship between age and attitude score ( $P = 0.04$ ). This study showed that residents with older age had a more positive attitude toward treating HIV-positive patients compared to younger ones (Figure 1).

Maximum score of knowledge was 24 and minimum score was 7 ( $14.5 \pm 2.8$ ) (Table 3).

The average score of knowledge in male subjects was  $14.5 \pm 2.8$ , for the female participants, it was  $14.6 \pm 2.7$ . There was no significant relationship between knowledge and gender ( $P = 0.70$ ) (Table 4).

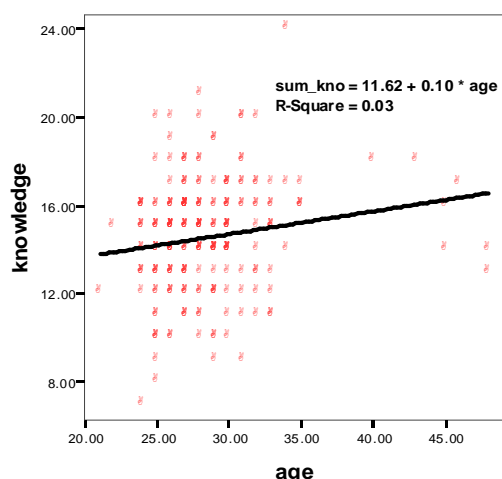
**Figure 1.** Mean attitude score according to age

**Table 2.** Answer of post-graduate dentistry students to attitude questions according to the gender

Questions	SA		A		NA-NDA		DA		SDA		P
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	
1	19	28	58	80	29	45	33	44	26	17	0.63
2	24	19	81	114	31	47	17	23	12	12	0.32
3	30	33	95	106	27	36	16	15	10	12	0.53
4	50	58	73	110	18	19	13	15	11	15	0.26
5	15	18	36	52	30	54	54	76	30	18	0.01*
6	16	18	38	68	25	41	57	74	26	17	0.02*
7	40	39	78	117	16	21	18	25	12	14	0.45
8	25	22	41	66	32	37	48	72	18	19	0.40
9	17	20	33	59	32	42	57	77	24	19	0.20
10	21	20	31	76	31	40	50	65	30	16	<0.01*
11	31	41	73	97	29	44	18	21	14	12	0.80
12	23	20	66	63	35	59	31	47	19	17	0.14
13	44	67	77	99	18	23	17	15	11	9	0.32

SA: Strongly agree; A: Agree; NA-NDA: Neither agree nor disagree; DA: Disagree; SDA: Strongly disagree  
\*Significant

Besides, there was a significant relationship between age and knowledge score ( $P = 0.01$ ). In other words, residents with older age had more knowledge about treating HIV patients compared to younger ones (Figure 2).

**Figure 2.** Mean knowledge score according to age

In addition, this study showed that there was no significant relationship between year of

study and attitude score and score of knowledge ( $P = 0.12$  and  $P = 0.09$ , respectively).

## Discussion

The results of this study revealed that only 24.3% of the subjects had previously provided services for HIV-positive patients. Data from a survey on 206 dentists from Chicago in 1989 revealed that only 16% of the subjects tend to work for HIV-positive patients.<sup>4</sup> Bennett et al. showed that 29% of the dentists were willing to work for these patients and about 90% of the dentist referred these patients to the dental schools, specialty clinics or specialists offices.<sup>9</sup> Lewis et al. showed that most of the dentists tend to refer these patients to the specialty clinics.<sup>6</sup> Oberoi et al. studied 427 dental students from India in 2014 and the willingness to treat HIV positive patients among dental students was 67.0%, and 74.20% were confident about treating a patient with HIV.<sup>5</sup> One study showed that Sixty-eight percent of the dentists declined appointment requests from

**Table 3.** Answer of post-graduate dentistry students to knowledge questions

Questions	Yes	No	Do not know
Saliva has been found to be a vehicle for the transmission of HIV	111	264	5
All patients should be considered potentially infected with HIV	361	13	6
Infection control methods for hepatitis B provide adequate protection against the transmission of HIV	323	86	29
The HIV virus is destroyed with all methods of sterilization	278	87	15
Application of chlorhexidine is essential before all dental procedures in HIV-infected patients	191	85	104
P24 is the screening test for the diagnosis of HIV infection	81	74	225
Intravenous drug is The most common route of HIV transmission in Iran	288	58	34
The UV radiation destroys HIV virus	181	81	118
HIV virus remains for a week on contaminated instruments and the environment	43	299	38
Oral manifestations of HIV lesions include lesions characterized by red-blue or purple plaques or nodules	188	118	74
The risk of HIV infections after a needle stick injury is about 45-50 percent.	29	305	46
Hepatitis B is known to be more infectious than HIV/AIDS	349	15	16

HIV: Human immunodeficiency virus; UV: Ultraviolet

patients with HIV.<sup>5</sup> Previous studies regarding the attitude of dentists have demonstrated that many of the dentists did not agree to work for these patients due to reasons including

exposure of the dental staff and other patients to the disease and loss of patients. Prevalence of anti-homosexuality among health care providers may affect their professionalism.<sup>7,14,15</sup>

**Table 4.** Answer of post-graduate dentistry students to knowledge questions according to the gender

Questions	Yes		No		Do not know		P
	Men	Women	Men	Women	Men	Women	
1	69	42	143	121	3	2	0.20
2	208	153	5	8	4	3	0.30
3	185	138	44	42	16	13	0.80
4	152	126	54	34	11	4	0.15
5	107	84	50	35	60	44	0.90
6	41	40	39	35	135	90	1.90
7	160	128	35	23	22	12	0.40
8	105	76	43	38	62	50	0.70
9	29	14	166	133	21	17	0.20
10	98	90	67	51	51	23	0.02*
11	21	18	169	136	30	16	1.90
12	200	149	9	6	7	9	0.43

\*Significant

Almost half of the subjects had already participated in educational programs on HIV. Educational curriculum of the dental schools throughout the world provides education in form of class lectures, clinical tutorials and oral presentations regarding treatment of HIV-positive patients. Despite the fact that knowledge of health care providers about this disease and treatment of the affected patients has increased, a few improvements have been made on fear of working for these patients and practically, it has had no effect on tendency to work for these patients.<sup>7,13</sup>

Educational curriculum of general course for dentistry only comprises of two theoretical concepts on treatment and infection control of HIV-positive patients plus oral manifestation of the disease. There is no such class provided in post-graduate level for the residents and they receive no education on these concepts.<sup>7,13</sup>

This study showed that 40% of the subjects consider their curriculum good for the treatment of HIV-positive patients which is consistent with study by Seacat and Inglehart.<sup>7</sup> Nearly all of the participants (95%) thought that each patient should be considered infected which is consistent with Seacat and Inglehart study (99.5%). About 31% of the subjects chose the wrong answer for the oral manifestations of HIV and 19.5% said that they do not know the manifestations. With regard to the same question, Seacat and Inglehart<sup>7</sup> showed that 32.2% made the wrong choice or said they do not know the answer to this question that this was similar to others studies.<sup>5</sup>

With regard to the question about needle stick and the risk of disease transmission, 80.3% made the right choice which is consistent with Seacat and Inglehart study.<sup>7</sup> In this study, 49.6% disagreed or totally disagreed with working for homosexuals and 45.8% disagreed with working for the addict patients. In Seacat and Inglehart study, most of the subjects were disagree with working for the HIV-positive patients.<sup>7</sup> There is not a

positive attitude in Iranian society toward homosexuality and addiction and these people do not have an accepted social norm. This disagreement might be due to incomprehension of the disease transmission risks, lack of enough facilities and lack of education. Undoubtedly, increasing the skills and self-esteem in facing HIV-positive patients causes tendency toward doing procedures on these patients.

Nearly half of the subjects agreed with group discussions and treatment of these patients in residency to achieve more skills and 76.6% of the subjects believed that treating an HIV-positive patient under precise clinical watchfulness increases the confidence of the doctors which is consistent with Seacat and Inglehart study.<sup>7</sup>

It seems that theoretical education of the post-graduate students beside clinical education in clinics and offices with precise supervision enhances the level of services given to these patients.

Results revealed that 94.3% of the subjects had high knowledge regarding HIV. This finding is consistent with Ayranci<sup>16</sup> and Seacat and Inglehart studies.<sup>7</sup> While studies conducted by Tefera et al. on rural population of Etiopia,<sup>17</sup> Rad et al. (Kerman Population),<sup>18</sup> Al-Serouri et al. (Yemens general Population),<sup>19</sup> Montazeri (Tehran Population),<sup>20</sup> Ramphoma and Naidoo,<sup>21</sup> AlMuzaini et al.<sup>22</sup> and Prabhu et al.<sup>23</sup> have shown a lower level of knowledge.

In another study by Jaiswal et al. on high school students, the level of knowledge was reported to be very low.<sup>24</sup> Undoubtedly, knowledge of residents should be higher than the general population due to their higher education and more in-depth studies.

In this study, the mean score of knowledge from 12 questions was  $14.5 \pm 2.8$  (range = 0-24). Although the score of knowledge section was not significantly different among male and female subjects but female participants had a higher level of knowledge. Similar to this finding, level of knowledge was reported to be

higher in female subjects compared to male ones in others studies.<sup>6,18-27</sup> Level of knowledge was higher in female participants in Seacat and Inglehart study<sup>7</sup> which is similar to Brook et al. study.<sup>28</sup> Despite these reports, Agrawal et al. demonstrated that boys had a better knowledge compared to girls.<sup>29</sup>

This study revealed that 29.2% of the subjects considered saliva as a media for virus transmission. Studies have demonstrated that saliva alone cannot transmit the disease and only saliva with blood can transmit the disease.<sup>17,19,20</sup> Similar to this study, Rad et al.<sup>18</sup> and Tavooosi et al.<sup>11</sup> showed that 30% of the participants believed that saliva can transmit the HIV. Therefore it seems that the level of knowledge about the virus propagation method is low, so a good educational program seems to be necessary for the pre- and post-graduate students and this may lead to decreased psychosocial distresses.

About 45% of the subjects had no problem with working in an environment which an HIV-positive person is working in. Rad et al. showed that 30.1% of the subjects agreed with the participation of HIV-positive patients in social programs and 49.1% agreed with quarantining HIV-positive patients.<sup>18</sup>

Seacat and Inglehart<sup>7</sup> and Tavooosi et al.<sup>11</sup> showed that about one third of the students disagreed with sitting near an infected person which is similar to Brook et al. study.<sup>28</sup> In Merakou et al. study, only 5% of the students expressed that they will deny their HIV friends.<sup>30</sup> This study was conducted after 15 years of HIV prevention in Greek Schools.

One third of the Indian students in Agrawal et al. study disagreed with entrance of infected person into universities.<sup>29</sup> This study is consistent with Krasnik and Wangel<sup>31</sup> and Ross.<sup>32</sup>

### Conclusion

The results of this study showed that post-graduate students had a positive attitude toward treatment of HIV-positive patients. Also, this study showed that post-graduate students had a good knowledge about HIV infection. It is also necessary to provide theoretical and practical education with enhancement of these programs for prevention and control of the disease which will lead to achieving more skills and enhancing self-esteem. Also due to fear and anxiety of some of the subjects about the transmission of the disease or loss of patients due to accepting to work for HIV-positive patients, it is necessary to strictly perform infection control procedures in dental offices beside enhancing the level of knowledge in society about the transmission routes of this disease.

### Conflict of Interests

Authors have no conflict of interest.

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