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Knowledge, Attitude and Practice of Dentists Towards Patients With HIV, Hepatitis B and Hepatitis C Infections

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Background: Dental practitioners can be exposed to the human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) during routine work.

Objectives: In this study, the knowledge, attitude, and practice of the dentists in Zahedan were examined on patients with HIV, HBV, and HCV infections.

Materials and Methods: This cross-sectional study was carried out on 100 dentists in Zahedan in 2013. A reliable and valid questionnaire on knowledge, attitude and performance of the dentists toward the infectious diseases of HIV, hepatitis B and C was distributed to all dentists who worked in Zahedan. Data were analyzed using one-way analysis of variance (ANOVA), independent sample t-test and Spearman rank correlation coefficient.

Results: The mean score of the knowledge, attitude and practice of the dentists were 51.45 ± 3.16 out of 63, 20.22 ± 3.74 out of 39 and 64.41 ± 4.49 out of 72, respectively. Most of the participants (95%) believed that the fear and concern of the transmission of HIV, HBV and HCV infections are among the reasons of refusing the infected patients. The relationship between demographic variables and the level of knowledge, attitude, and practice of dentists was not statistically significant.

Conclusions: Although the dentists had a proper knowledge in the field of transmission of HIV, HBV, and HCV infections, fear and concern of being infected make them to refuse these patients. Therefore, training dentists to improve their attitudes toward treatment of these patients is necessary.

Keywords: Knowledge; Attitude; Dentist; HIV

1. Background

The prevalence of the AIDS (acquired immunodeficiency syndrome) continues to increase. Regarding the global estimate, over 40 million people are infected all over the world (1). The prevalence of the HIV infection and AIDS are growing in Iran too. Iran has experienced a 3-fold increase in reported HIV cases with a total number of 1159 new cases from 1999 to 2001 (2). The increase in the incidence of patients with HIV infection in Iran is largely due to injection-drug users. It is also associated with the sexually transmitted diseases which their rates are significantly increasing (3). HBV is a DNA virus that causes viral hepatitis. This type of virus has caused epidemics in some parts of Asia and Africa (4). Infection with HBV and HCV are serious problems worldwide. Although hepatitis B is preventable with vaccine, there is no effective vaccine against HCV infection. According to the World Health Organization (WHO), two billion people in the world have serological evidence of prior HBV infection in whom over 350 million people are chronic carriers and more than 3% (170 million) are infected with HCV (5). Seventy-five percent of the HBV carriers live in Asia, and Iran has a low-to-moderate rank in this regard. According to previous reports, HBV incidence has degraded in Iran dramatically. It may be due to the improvement of the people's knowledge about HBV, the national vaccination program for all newborns, and the vaccination of high-risk groups (5).

Dental treatment often includes direct contact with patients' blood and saliva; therefore, dentists and dental students can be exposed to some microorganisms such as HIV, HBV, and HCV. HIV and viral hepatitis can be transmitted to dental staff by professional exposure, most often by a needle stick injury. However, the risks of infection with HIV, HBV, or HCV by needle stick differ significantly (0.3% for HIV, 3% for HCV and 30%-50% for HBV) (6). Fear of transmission of this virus is one of the reasons why dentists refuse to treat the patients with HIV infection (3).

Despite WHO recommendations to dentists on the treatment of HIV patients, there are some reports in the UK (7), North America (8), and Italy (9) in which, many of the dentists refuse the treatment of HIV patients due to the lack of knowledge about this type of infection. Also it was reported that 40%-70% of the dentists refused the

treatment of patients with HIV and hepatitis infections in Iraq (10). According to a report in the literature, Pakistan among the other countries has the highest proportion of the infected patients with chronic hepatitis and death due to hepatitis B and C (11). Since Zahedan is located near the border of the Pakistan and because of the foreigners' traveling to this region, the attention of dentists to these diseases is important.

2. Objectives

This study aimed at the assessment of the knowledge, attitude and the practice of Iranian dentists towards patients with HIV, hepatitis B and hepatitis C infections.

3. Materials and Methods

To carry out this cross-sectional study, all dentists who worked in the private, government clinics, or the dental offices in Zahedan were enrolled. A validated questionnaire (2, 5, 6) was used to collect the data. The questionnaire consisted of four parts: first, demographic information (age, sex, work experience, place of education, and workplaces); second, evaluation of dentists' knowledge (consisted of 21 questions) about the infectious diseases of HIV/AIDS, hepatitis B and C (each correct answer received three points, two points for "do not know" answers, and one point for incorrect answers); third, assessment of dentists' attitudes regarding these diseases (included 13 items and assessed by a three-point Likert scale 3 = agree, 2 = uncertain, 1 = disagree); fourth, evaluation of dentist's performance (consisted of 18 items with 4-answer formats of always, often, sometimes, and none). Finally, scores of knowledge, attitude and practice were classified into three levels: good, moderate, and poor, as shown in Table 1.

Questionnaires were distributed in dental workplaces and collected in the same session. Data were analyzed by statistical software SPSS v. 19, one-way ANOVA, independent sample t-test and Spearman rank correlation coefficient. $P < 0.05$ were considered statistically significant.

4. Results

In this study, the knowledge, attitude, and practice of Iranian dentists towards the patients with HIV/AIDS, hepatitis B and hepatitis C infections were investigated. Of the total 100 general dentists, 42 (42%) were female and 58 (58%) were men. Their mean age was 34 ± 6.86 years (range: 25-54 years). Most dentists (42%) were in the age group of 30-40 years and the lowest number of them (3%) was in the age group of 50-60 years. About 64% of dentists had less than ten years' experience, and the remaining had ten years or more experience. Results also showed that 97% of dentists have graduated from the state universities and most of them (60%) were working only in their dental office. According to the findings, the mean score of knowledge, attitude, and practice of dentists were 51.45 ± 3.16 out of 63, 20.22 ± 3.74 out of 39, and 64.41 ± 4.49 out of 72, respectively, which is shown in Figure 1.

According to Table 2, the majority of dentists (over 89%) had chosen the correct answers about the transmission infections of HIV/AIDS, HBV and HCV. The lowest percentage of the correct answers was about the prevalence of hepatitis B (12%) and hepatitis C (19%) in Iran. Thirty-nine percent of the dentists said that people with hepatitis C and B should receive dental treatment in the hospital (Table 2).

Ninety-two percent of the dentists believed that they are anxious about increasing the risk of the HIV and hepatitis infections transmission while treating them. Also 95% of respondents agreed that dentists should consider every patient to be potentially infectious. Seventy-three percent of the dentists said that they prefer not to treat patients who are HIV-positive and 70% of dentists believed that infected patients should be treated at a specialist clinic (Table 3).

Almost all the dentists (99%) always wore gloves and used new gloves for each patient. A large majority used a face mask (93%), but only a small group (55%) changed it between patients. The use of protective eyeglasses was 75%. Only 13% of dentists were willing to assist with the centers that provide services to patients infected with HIV, HBV, and HCV. Autoclave and dry-heat sterilization were the most common methods of decontamination recorded in this study (Table 4).

Spearman rank correlation analysis showed a positive correlation between knowledge and attitude of dentists toward patients with HIV, HBV, and HCV ($r = 0.21$, $P = 0.04$). There were no significant correlations between knowledge and practice or attitude and practice of dentists ($r = -0.15$, $P = 0.13$ and $r = 0.13$, $P = 0.2$ respectively). In this study, according to the statistical sample t-test and one-way ANOVA, no statistically significant difference was found between demographic variables and the level of knowledge, attitude, and practice of the dentists (Table 5).

Table 1. Levels of Knowledge, Attitude, and Practice of Dentists

	Poor	Moderate	Good
Knowledge	21-35	36-50	51-63
Attitude	13-21	22-30	31-39
Practice	18-36	37-54	55-72

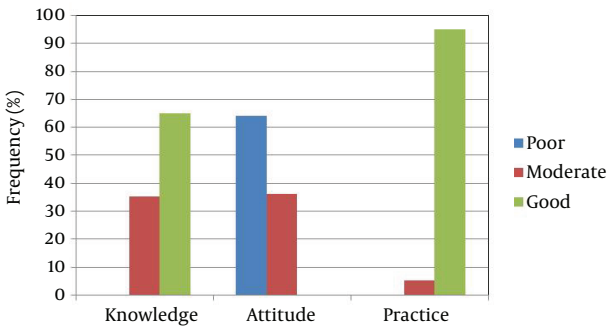

Figure 1. Comparison of the Knowledge, Attitude, and Practice of Dentists

Table 2. Dentists' Knowledge Regarding HIV/AIDS, Hepatitis B Virus, and Hepatitis C Virus infections (n = 100) [a,b]

Questions	Yes	Do Not Know	No	Correct Answer
Can HIV/AIDS be transmitted from mother to child?	96	4	0	96
Can HIV be transmitted through air or water?	2	9	89	89
Can HIV be transmitted through social contact (shaking hands, kissing, sharing glasses, clothes, etc.)?	4	1	95	95
Can HIV be transmitted through saliva?	19	18	63	63
Can HIV be completely cured with antiretroviral therapy?	15	31	54	54
Can antiviral medications (e.g. acyclovir, amantadine) be used to treat HIV/AIDS?	47	16	37	37
Can patients with HIV/AIDS donate blood?	8	1	91	91
Is post-exposure HIV prophylaxis recommended after a needlestick injury?	68	16	16	68
Can HIV infection develop into AIDS within a year?	69	7	24	24
Is the risk of HIV infection after a needlestick about 50%-75%?	11	25	64	64
Is hepatitis B mainly transmitted through sexual contact or blood?	96	2	2	96
In health care professionals, can hepatitis B be transmitted through blood splashing into mucous membranes of the eye or mouth?	98	1	1	98
In health care professionals, can hepatitis B be transmitted through mechanical skin injury?	89	7	4	89
Can hepatitis B virus and hepatitis C virus infections result in chronic hepatitis and liver cancer?	90	9	1	90
Is a vaccine for hepatitis C available?	8	40	52	52
Should individuals with hepatitis B or C infection receive dental treatment in hospital?	39	21	40	40
Is the risk of hepatitis C infection after a needlestick about 10%-20%?	21	40	39	39
Is vaccination against hepatitis B an efficient protection against infection after an infected needlestick?	40	19	41	40
Is transmission after needlestick higher for HBV in comparison with HIV?	83	13	4	83
Is prevalence of HBV lower than 1% in Iranian population?	59	29	12	12
Is prevalence of HCV lower than 1% in Iranian population?	19	62	19	19

[a] Abbreviations: HIV, human immunodeficiency virus, HBV; hepatitis B virus; HCV, hepatitis C virus.
[b] Data are presented as %.

Table 3. Dentists' Attitudes Toward Patients With HIV/AIDS, Hepatitis B Virus, and Hepatitis C Virus Infection (n = 100) [a,b]

Statement	Level of Agreement With Statement		
	Agree	Uncertain	Disagree
I would prefer not to treat patients who are HIV-positive.	73	10	17
Dentists should have the opportunity to refuse to treat patients with HIV or hepatitis.	72	16	12
Patients with HIV or hepatitis should receive dental treatment in specialized clinics.	70	19	11
If I found out that my longtime patient had HIV or hepatitis, I would stop treating him.	23	15	62
Fear and concern about being infected with HIV, HBV, and HCV is one of the reasons to refuse infected patients.	95	2	3
Dentists are anxious about increasing the transmission risk of the HIV and hepatitis infections while treating them.	92	0	8
Regardless of clinical precautions, transmission risk of the HIV and hepatitis exist from patient to dentist.	63	2	35
Regardless of clinical precautions, transmission risk of HIV and hepatitis exist from dentist to patient.	52	8	40
Regardless of clinical precautions, transmission risk of HIV and hepatitis exist from patient to patient.	52	4	44
Dentists have a professional obligation to treat HIV-positive patients.	67	16	17
Infection control for prevention of HIV transmission should be more than those for the prevention of HBV.	70	8	22
Infection control principles are adequate for the prevention of transmission of the HIV and hepatitis.	52	19	29
All patients should be considered potentially infectious.	95	0	5

[a] Abbreviations: HIV, human immunodeficiency virus, HBV; hepatitis B virus; HCV, hepatitis C virus.
[b] Data are presented as %.

Table 4. Infection Control Practices in Iranian Dentists (n = 100) [a,b]

Statement	Answer			
	Always	Often	Sometimes	None
Use latex gloves	99	1	0	0
Change gloves between patients	99	1	0	0
Use facemask	93	5	2	0
Change face mask between patients	55	20	21	4
Use gown	68	9	13	10
Wash hands before treatment	63	27	9	1
Wash hands after treatment	85	10	5	0
Change dental unit cover daily	84	7	5	4
Use protective glasses	75	15	9	1
Wash protective glasses	64	19	16	1
Cover all instrument to prevent contamination	73	20	7	0
Recap needles	88	7	5	0
Use gown for patient	98	1	1	0
Sterilized your instruments by autoclave or dry heat	96	3	1	0
Accepting patients with HIV, hepatitis B and C infections	26	25	38	11
Willing to work with the centers that service the patients infected with HIV, HBV and HCV	13	24	39	24
Existence of fear and concern during treatment of the patients with HIV, hepatitis B and C infections	66	23	11	0

[a] Abbreviations: HIV, human immunodeficiency virus, HBV; hepatitis B virus; HCV, hepatitis C virus.
[b] Data are presented as %.

Table 5. Relationship Between Dentists' Knowledge, Attitudes and Practices Toward Patients With Human Immunodeficiency Virus, Hepatitis B Virus, and Hepatitis C Virus With Demographic Characteristics (n = 100) [a]

Demographic characteristic	Knowledge	P value	Attitude	P value	Practice	P value
Gender		0.22				0.97
Female	51.90 ± 3.00		19.86 ± 3.69	0.41	64.42 ± 3.85	
Male	51.12 ± 3.27		20.48 ± 3.78		64.39 ± 4.93	
Age, y		0.71		0.51		0.43
20-29	51.63 ± 3.56		19.61 ± 3.35		63.69 ± 5.35	
30-39	51.23 ± 3.01		20.19 ± 3.79		64.92 ± 3.33	
40-49	51.31 ± 2.76		21.18 ± 4.32		64.09 ± 5.15	
> 50	53.33 ± 4.5		20.33 ± 1.52		67.33 ± 2.51	
Work Experience		0.48		0.44		0.41
<10 years	51.28 ± 3.22		20 ± 3.73		64.68 ± 4.28	
≤10 years	51.57 ± 3/09		20.61 ± 3.77		63.91 ± 4.86	
Place of education		0.94				0.72
State university	51.43 ± 3.21		20.2 ± 3.75	0.72	64.38 ± 4.52	
Non-state university	51.33 ± 0.57		21 ± 4		65.33 ± 3.78	
Work place		0.67		0.44		0.10
Dental office	51.76 ± 3.18		20.58 ± 3.58		64.61 ± 3.94	
Government clinic	50.61 ± 2.43		18.84 ± 4.20		66.23 ± 3.76	
Private clinic	51.00 ± 3.97		20.92 ± 4.32		61.53 ± 6.65	
Government and private clinic	50.25 ± 4.11		18.75 ± 3.77		64.75 ± 4.11	
Government, private clinic, and dental office	51.70 ± 2.58		19.5 ± 3.20		64.40 ± 4.40	

[a] Data are presented as Mean ± SD.

5. Discussion

Dentists may encounter patients infected with HIV, HBV, and HCV. Therefore, knowledge, attitude, and practice of them play an important role in improving their health and society's health status. In this study, the knowledge, attitude, and practice of dentists in Zahedan regarding these infectious diseases were examined.

5.1. Knowledge

In the present study, the mean knowledge score was 51.45 ± 3.16, (out of 63) and 65% of dentists participating in this study had a good knowledge. Vitale et al. (12) showed that, most of the dentists in Italy had a proper knowledge about the transmission patterns of HIV, HBV, and HCV. However, in Askarian et al. study (3), the level of knowledge about the modes of transmission of HIV was low. Also in Al-Sandook et al. study (10), the knowledge regarding the HIV and hepatitis B and C was low. Batool et al. (13) showed that, most of the dentists were well-aware of the etiology and modes of transmission of HBV and HCV, but there was some lack of knowledge in this matter. Based on their study, 7% of the dentists were unaware of HBV vaccine and 25% of them noted that vaccine for hepatitis C is available. In the present study, 8% of the dentists noted about the existence of hepatitis C vaccine; although this ratio is lower than Batool et al. report (13); nevertheless, it brings up a concern because almost all the dentists should be aware of existence of the HBV and HCV vaccine. In the present study, there were no statistically significant differences between the level of the dentist's knowledge and their demographic information, which is consistent with the Crossley study (14). In Askarian et al. study (3), level of the knowledge about the modes of HIV transmission was significantly associated with the education level. Also in Al-Sandook et al. study (10), the level of the dentist's knowledge on the infection of HIV, HBV, and HCV had a significant correlation with education and gender.

5.2. Attitude

The mean score of dentists' attitudes towards patients infected with HIV, HBV and HCV was 20.22 ± 3.74, which indicated poor attitude in 64% of the dentists. Most of the dentists (95%) believed that the fear and concern about being infected with HIV, HBV and HCV is one of the reasons to refuse the infected patients. More than half of the dentists (63%) believed that, despite clinical precautions, there is a risk of transmission of HIV and hepatitis infection from patient to dentist. In our study, 73% of the dentists refused to treat HIV-positive patients. Only 17% of the dentists tend to treat these kinds of patients. Similar to the present study, in Al-Sandook et al. report (10) , 40%-70% of the dentists refused the treat these patients. However, in studies of Gachigo et al. (15) in Kenya and Askarian et al. (3) in Iran, most of the dentists were willing to treat HIV-positive patients.

In our study, the majority (67%) of responders stated that they have a professional duty towards the treatment of HIV and HBV positive patients which is in agreement with Crossley report (14). In the Askarian et al. and Maupome et al. reports (3, 16), 89% and 77.7% of dentists emphasized that it was their professional and ethical duty to treat these patients. Also in previous studies, it has been shown that a sense of moral responsibility is important in accepting the infectious patients (8). Therefore, it is one of the strongest factors, which can predict the avoidance of treating these patients. In this study, there was no statistically significant difference between dentist's attitudes and demographics data. Also, in Savabi et al. report (17), there was no significant correlation between gender, educational place, and work experience with dentist's attitude. But the attitude of the specialist dentists was better than general dentists.

5.3. Practice

In the present study, the average of the dentist's practice scores was 64.41 ± 4.49, indicating that the optimal performance of 95% the dentists. One of the reasons which caused the dentists performed their duty by considering the principles of infection control, was their training in recent years. For example, using the gloves, gown and face masks by the dentists was 99%, 98% and 93%, respectively. With regard to some studies which have been carried out in Iran and Mexico (3, 16), the majority of dentists used gloves and face masks in treating with the patients which agrees with our present results. In contrast with this study, Al-Sandook et al. (10) reported that only 2.38% of the dentists used three main protection tools (gloves, glasses, face masks), which is very lower than the reports from other developing countries. Although hand washing is considered as one of the basic principles of the infection control, compliance by some dentists is lower than ideal (3).

In the present study, 63% of the dentists reported that they washed their hands before treatment and 85% of them after treatment. In a study in Italy and United States (18, 19), this ratio was reported 79% and 59%, respectively. Since the face mask is considered a source of contamination, it must be changed during the work every 20 minutes of usage because it becomes saturated with many microorganisms. Therefore, the dentists who use a face mask all day are at the greater risk of cross-infection than the dentists who do not use (10). In this study, almost half of the dentists reported that they always change their face masks between patients. As mentioned above, wearing gloves and face masks are more important than other infection control measures because these are more visible and acceptable by the patients. In this study, there was no significant correlation between dentist's practice and demographic information. However, in the study of Savabi et al. (17), dentist's practice was better in private and government clinics than dental offices. Askarian et

al. (3), showed that dentists with more experience had better performance. Because of the poor attitude of the dentists towards the patients with HIV, HBV and HCV infections, educational programs are recommended to eliminate the fear and concern towards hepatitis and HIV infections.

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