



# **Knowledge and Attitude Concerning the Dental Treatment of Patients with HIV/AIDS among Dental Students and Dentists in Saudi Arabia**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

## **Article Information**

DOI: 10.9734/JPRI/2021/v33i48B33289

### Editor(s):

(1) Jongwha Chang, University of Texas, College of Pharmacy, USA.

(2) Takashi Ikeno, National Institute of Mental Health, National Center of Neurology and Psychiatry, Japan.

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(2) George O. Chukwuma, Nnamdi Azikiwe University, Nigeria.

(3) Edmond Puca, University Hospital Center, Albania.

Complete Peer review History: <https://www.sdiarticle4.com/review-history/75879>

**Original Research Article**

**Received 08 September 2021**

**Accepted 03 November 2021**

**Published 10 November 2021**

## **ABSTRACT**

**Aims:** to assess the HIV/AIDS-related knowledge and attitude among dental students and dentists in KSA, to explore the association between the dental students' knowledge toward HIV, their age, gender, and academic year and to compare the level of knowledge among dental students, interns, and dentists.

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**Study design:** This is an observational cross-sectional study.

**Place and Duration of Study:** Conducted in Saudi Arabia at Jeddah, Riyadh, Almadina, Hail, Dammam, Jazan, and Sakaka cities from December 2020 to August 2021.

**Methodology:** Self-administered questionnaires were used to collect data. Background information and HIV/AIDS-related knowledge and attitudes were collected using a self-administered -based questionnaire, the first section assessed demographic data, while the second section assessed knowledge and attitudes towards dental treatment for HIV/AIDS patients.

**Results:** The total number of participants was 461. The percentage of age distribution 49.7% were 30 years. Following; knowledge-based group 50.5%, 1.5% and 47.1% 14 considered blood, saliva are possible HIV origins. 83.3% believe that HIV is transfusion origin. 15 While, 3.3% considered disease is contiguous and 4.8% believe it is due to sharing of food.

**Conclusion:** Current study reveals a lack of knowledge and attitude among dental students 17 and dentists, with insignificant variations. More education regarding AIDS patients is needed 18 in dentistry community.

*Keywords: HIV; awareness; AIDS; dental treatment.*

## ABBREVIATIONS

*HIV* : Human Immunodeficiency Virus;

*HAART* : Highly Active Antiretroviral Therapy.

## 1. INTRODUCTION

The human immunodeficiency virus (HIV) harms the immune system by attacking a kind of white blood cell that contributes in infection defense [1]. It might lead to acquired immunodeficiency syndrome (AIDS), the most severe stage of HIV infection, if left untreated [2]. When the first incidence of HIV was found in Saudi Arabia in 1984, the country launched an HIV screening program for blood and blood products [3]. Human Immunodeficiency Virus (HIV) created many health and socioeconomic challenges across the world, and the discovery of Highly Active Antiretroviral Therapy (HAART) was responsible for a huge reduction in HIV morbidity and mortality [4]. With higher survival rates, it is expected that more HIV-positive individuals, whether or not they are aware of their serologic status, may seek dental care in the near future [5]. Furthermore, patients still have oral symptoms such as caries, periodontal disease, and aphthous stomatitis after receiving HAART [4]. Oral care is crucial for HIV patients' nutritional intake, medication effectiveness, treatment success rate, and overall quality of life [6].

The World Health Organization declared in 1988 that treating HIV patients is an obligation for all dentists [7]. The knowledge and attitude of dental practitioners have been proven in several studies to be an important factor in providing dental treatment [4]. Several studies have been

undertaken throughout the years to measure dental students' and practitioners' knowledge and attitudes about HIV patients. According to a survey conducted in Brazil in 2015, 54.3% of dentistry students have a negative attitude [8]. Another study published in Korea in 2011 indicated that dentists had sufficient understanding of HIV/AIDS and have a relatively positive attitude toward patients [9]. In China, the findings found that more than half of the participants have a good understanding of HIV/AIDS but have a negative attitude about it [10]. According to a study conducted in Jizan, Saudi Arabia, dental students at Jazan University had low HIV/AIDS knowledge and attitudes when compared to students in other countries [11]. Our study was undertaken on a larger scale, including more than one city in Saudi Arabia (Jeddah, Riyadh, Almadina, Hail, Dammam, Jazan, and Sakaka). We aimed to assess the HIV/AIDS-related knowledge and attitude among dental students and dentists in KSA, to explore the association between the dental students' knowledge toward HIV, their age, gender, and academic year and to compare the level of knowledge among dental students, interns, and dentists.

## 2. MATERIAL AND METHODS

### 2.1 Study Design

A cross-sectional, survey-based study was done among dental students starting from 4th year-interns and dentists in Saudi Arabia at Jeddah, Riyadh, Almadina, Hail, Dammam, Jazan, and Sakaka cities from December 2020 to August 2021.

## 2.2 Data Collection

Self-administered questionnaires were used to collect data. Background information and HIV/AIDS-related knowledge and attitudes were collected using a self-administered -based questionnaire, the first section assessed demographic data, while the second section assessed knowledge and attitudes towards dental treatment for HIV/AIDS patients.

## 2.3 Statistical Analyses and Sample Size Calculation

This study was analyzed with IBM SPSS version 23 (IBM Corp., Armonk, N.Y., USA) and visually presented with GraphPad Prism version 8 (IBM Corp., Armonk, N.Y., USA) (GraphPad Software, Inc., San Diego, CA, USA). For categorical and nominal variables, simple descriptive statistics in the form of counts and percentages were used to define the characteristics of the study variables. Continuous variables, on the other hand, are represented by mean and standard deviations. As dependent variables, two domains were used. These two domains were Knowledge and Attitude Score, which were converted to correct and incorrect for knowledge and positive and negative for attitude using the questions in each domain. It was represented by the numbers 1 and 0. The score was calculated and converted to a hundred-point scale using a simple additive method. An independent t-test was used to compare the domains to demographical data and indicators for two-group means, and a One-Way ANOVA with Least Significant Difference (LSD) as a post hoc test was used for more than two-group means. The normal distribution assumption was used in these tests. Finally, the null hypothesis was rejected if the p-value was less than 0.05. The sample size calculated with a 95% confidence level; a 5% margin of error is acceptable. The statistical analysis included a total of 461 eligible participants who completed the questionnaire and were examined.

## 3. RESULTS AND DISCUSSION

Data was collected during the period from December 2020 to August 2021. A total of 461 the participants' ages were between 22 to 55 years old with mean age of 25.15 years old (SD 3.3). Out of the 461 participants 59% were women and 41% were men. Most of these were younger than 25 years old (49.7%) and younger than 30 years old (41.9%) and consequently makes the remaining 8.5% to be older than 30

years old. As for the type of academic year, there are interns (17.8%) and students from 6th year (24.3%), 5th year (10.8%) and 4th year (12.8%) and more than a quarter were dentists (34.3%) already. The participants were from different cities of Al Madinah (21.3%), Dammam (10.4%), Hail (9.1%), Jazan (17.8%), Jeddah (19.5%), Riyadh (18.2%) and Sakaka (3.7%). A total of 462 participants met the eligibility criteria and were included in the statistical analysis. The socio-demographic characteristics of the participants are shown in (Table 1).

### 3.1 Knowledge-based Characteristics of the Participants

The participants were given 6 sets of questions that measured their knowledge regarding infection mode of transmission, proper treatments for infected patients and the adherent risks associated with infected patients. As shown on Table 2, the different participants think that the possible sources of HIV are blood (50.5%), saliva (1.5%) and both blood and saliva (47.1%). Most of the participants think that the possible route of HIV infection is by transfusion from an HIV-infected person (83.3%) and there are a few who thinks that it can be route by shaking hands or hugging (3.3%) and drinking or eating from the same HIV patient's plate (4.8%). In terms of the risk of transmission of HIV infection (regardless of clinical precautions), many believed that it can be transmitted from patient to dentist or to another patient (81.8%) while only 12.6% did not believe this and 5.6% didn't have an idea. Additionally, a reverse situation of transmission was also asked to the participants and similarly, many believed that both HIV/AIDS and hepatitis can be transmitted from dentist to patients (76.4%) while only 17.4% did not believe this and 6.3% didn't have an idea. Regarding medication, 29.7% of the participants think that antivirals like acyclovir and amantadine can be used to treat HIV/AIDS while 39.7% don't believe this and 30.6% don't have an idea. As for how to treat infected patients, most of the participants have not experienced such a situation (47.1%). Those that have experience, 13.9% treat same as the non-infected patients while 23.4% cautiously treat patients in isolated rooms, 9.1% relieve chief complaint and refer to specialists, 3.9% refer to specialists due to unsuitable treatment conditions and 2.6% have mentioned other means of treatment such as wearing PPE, double mask and gloves and refusal to treat and refer immediately to hospitals (Table 2).

**Table 1. Socio-demographics characteristics of the study participants (n=461)**

		Count	%
<b>Demographics</b>		<b>461</b>	<b>100.0</b>
Gender	Male	189	41.0
	Female	272	59.0
Age	Lessthan25yearsold	229	49.7
	25-29years old	193	41.9
	30years old andabove	39	8.5
Academicyear	4thyear	59	12.8
	5thyear	50	10.8
	6thyear	112	24.3
	Dentist	158	34.3
Thecity	Internship	82	17.8
	AlMadinah	98	21.3
	Dammam	48	10.4
	Hail	42	9.1
	Jazan	82	17.8
	Jeddah	90	19.5
	Riyadh	84	18.2
	Sakaka	17	3.7

**Table 2. Knowledge characteristics of the participants (n=461)**

Variables	Total	Count	%
		<b>461</b>	<b>100.0</b>
What do you think the possible infectionsourcesofHIVare?	PatientinfectedwithHIVsaliva.	7	1.5
	PatientinfectedwithHIVblood.	233	50.5
	PatientsinfectedwithHIVbloodandsaliva.	217	47.1
	Idon'tknow	4	0.9
What do you think of possible routes of HIVinfection?	bytransfusionfromanHIV-infectedperson	384	83.3
	byshakinghandsorhugginganHIV-infectedperson	15	3.3
	by drinking or eating from the same HIVpatient'splates	22	4.8
	Idon'tknow	40	8.7
Regardless of clinical precautions, there is riskfor HIV/AIDS transmission from patient todentistoranotherpatient.	Yes	377	81.8
	No	58	12.6
	Don'tknow	26	5.6
Regardless of clinical precautions, there is ariskforHIV/AIDSandhepatitistransmissionfromdentistto patient.	Yes	352	76.4
	No	80	17.4
	Don'tknow	29	6.3
Can antiviral medications (e.g., acyclovir,amantadine)beusedtotreatHIV/AIDS?	Yes	137	29.7
	No	183	39.7
	Don'tknow	141	30.6
How did you treat patients with HIVinfection/AIDS?	No experience	217	47.1

Variables	Count	%
<b>Total</b>	<b>461</b>	<b>100.0</b>
Same as non-infected patients	64	13.9
Treatment cautiously in isolated rooms after patient's agreement	108	23.4
Relieving chief complaint and referring to specialists	42	9.1
Referring to specialists due to unsuitable treatment conditions	18	3.9
Others	12	2.6

**Table 3. Attitude-based Characteristics of the Participants towards HIV/AIDS transmission**

Variables	Count	%
Total	461	100.0
Regardless of clinical precautions, there is risk for HIV/AIDS transmission from patient to dentist or another patient.	Yes	377
	No	58
	Don't know	26
Regardless of clinical precautions, there is a risk for HIV/AIDS and hepatitis transmission from dentist to patient.	Yes	352
	No	80
	Don't know	29
Can antiviral medications (e.g. acyclovir, amantadine) be used to treat HIV/AIDS?	Yes	137
	No	183
	Don't know	141
Dentists should have the opportunity to refuse to treat patients with HIV/AIDS.	Yes	151
	No	248
	Don't know	62
Fear and concern about being infected with HIV/AIDS is one of the reasons to refuse infected patients.	Yes	338
	No	91
	Don't know	32

**Table 4. Experiences during practice of profession and sources of information**

Variables	Count	%
Total	461	100.0
What do you think of cross-contamination after treatment of HIV infected/AIDS patients?	Large risk despite routine disinfection and sterilization	226
	Low risk with careful disinfection and sterilization	162
	Very low risk with routine disinfection and sterilization	52
	No risk	21
Willing to work with the centers that service the patients infected with HIV/AIDS?	Yes	227
	No	115
	Don't know	119
Do the students of dental college consider HIV/AIDS as an important disease for KSA and for the world?	Yes	354
	No	35
	Don't know	72
Your main sources of HIV management are from?	Dental school	401
	Social media / google	43
	Your friend/family	8
	Others	9
	<b>Count</b>	<b>%</b>
Total	9	100.0
Other	Books	1
	Collectively between dental school and	1

Variables	Count	%
internet		
Combination	1	11.1
Dental management books & my seniors	1	11.1
Dental school +google	1	11.1
Dental school and articles	1	11.1
Dental school and social media	1	11.1
Google scholar	1	11.1
Reading all sources regarding it and self learning regarding this subject	1	11.1

### 3.2 Attitude-based Characteristics of the Participants

In this study, most of the participants feel threatened almost every day (26.5%), 1-2 times per week (9.1%), 1-2 times per month(9.8%), 1-2 times per year (19.5%) while 35.1% of the participants never feel threatened with infectious diseases by patient’s saliva or blood during dental procedures. So, as to the willingness to work in centers that service patients infected with HIV/AIDS, 49.2% should be willing while 24.9% are not willing and 25.8% don’t know at the moment. Whether participants should have the opportunity to refuse to provide dental treatment to patients infected with HIV/AIDS, 32.8% of the participants will refuse if given the chance while 53.8% won’t refuse while the remaining 13.4% are neutral about it. Considering the reason for refusal, it was “fear and concern about being infected with HIV/AIDS as the main reason” for the 73.3% of the participants and not to the 19.7% while the 6.9% don’t know the reason for refusal (Table 3).

### 3.3 Experiences and Sources of Information

Experiences during practice of profession and sources of information that may affect the level of knowledge and attitude towards HIV/AIDS infection were also determined. In this study, participants were asked of the incidence of being pricked by a sharp dental instrument within a year. As shown on Table 4, most of the participants experienced this less than 5 times (51.4%), 5-9 times (4.8%), 10-20 times (3.5%) and above 20 times (2.4%) while 38% didn’t have any experience of this. As to experiences of giving dental treatment to patients with HIV infection, there are participants that have experienced above 10 patients (1.3%), 6-10 patients (2.4%), 2-5 patients and mostly did not experience this but identified the possibility (56.4%) and no possibility (33.4%).In terms of

whether students of dental college consider HIV/AIDS as an important disease for KSA and for the world, the majority did (76.8%) while 7.6% did not and 15.6% don’t know. The main sources of information of the participants were dental school (87%), social media/google (9.3%), friends/family (1.7%) while the remaining 2% identified other sources such as books, internet materials and combination of books and internet.

### 3.4 Knowledge Score on HIV/AIDS of the Participants

The participants were given 6 sets of questions that measured their knowledge regarding infection mode of transmission, proper treatments for infected patients and the adherent risks associated with infected patients. Correct responses were given a score of one (1) and zero (0) for the incorrect responses. The overall knowledge score was computed by adding all the correct responses and the highest possible score individually is 6.

The average knowledge score of the 461 participants is 55.93 (min 0 max 100, SD 19). Only half of the participants correctly responded that the possible source of HIV is blood (50.5%) and the other half of the participants incorrectly think saliva as a source of HIV infection (49.5%). Majority correctly identified that the possible route to HIV/AIDS infection is by transfusion from an infected person (83.3%) and only few thinks that shaking/hugging and eating together with an infected person (16.7%). Also, the majority of the participants have correct knowledge that regardless of clinical precautions, the risk of infection transmission is possible from patients to dentist (81.8%) and as well as from dentists to patients (76.4%).

In terms of treatment, the majority of the participants treat patients with HIV/AIDS infection incorrectly (86.1%) and only very few treat

patients the same as non-infected persons (13.9%) correctly. Also, only few of the participants correctly think that antivirals can be used to treat HIV/AIDS (29.7%) and the remaining 70.3% incorrectly think it can't.

The distribution of participants' knowledge on HIV/AIDS is presented on Fig. 1. The important information that can be gleaned from this figure is where most of the participants have lower and higher knowledge. In this figure, it shows that how to properly treat patients with HIV/AIDS during dental schedules and knowledge on the use of antivirals to treat this infection are among the lowest wherein only less than 30% of the population are knowledgeable about this on the other hand, it is on the possible route of HIV/AIDS infection and as well as the risk for HIV/AIDS transmission both from patients to dentist and dentist to patients is where the population are more knowledgeable about where 76-83% of the participants knew about this matter [12-14].

### 3.5 Attitude Score on HIV/AIDS of the Participants

There are 5 sets of questions given to the participants in order to determine their attitude towards risk associated with getting the infection from their working area together with their fears and concerns. A negative attitude was given the score of zero (0) while one (1) for a positive attitude. The highest possible score individually for this matter is 5 points. The overall attitude score was computed by adding all the positive responses and the highest possible score individually for this matter is 5 points.

The average attitude score of this population (N=461) is 49.33 (min 0 max 100, SD 20.8). There are more participants that feel negatively (69.9%) about the threat of infection by patients' saliva or blood during dental procedures while only 35.1% have a positive attitude about this. The same numbers were observed on the attitude about cross-contamination after treatment of HIV infected/AIDS patients. There was almost equal distribution of positive and negative attitude observed among the participants in terms of willingness to work with the centers that service the patients infected with HIV/AIDS (49.2% and 50.8%, respectively) and if dentist should have the opportunity to refuse to treat patients with HIV/AIDS (53.8% and 46.2%, respectively). When asked about whether fear and concern of being infected with HIV/AIDS is one of the reasons to refuse infected patients, the majority of the participants showed a positive attitude (73.3%) towards this and only 26.7% were negative about it. The distribution of participants' attitude on HIV/AIDS is presented on Figure 2. The important information that can be extracted from this figure is in what aspect most of the participants have negative and/or positive attitudes. In this figure, it shows that "cross- contamination after treatment of HIV/AIDS infected patients" and as well as "threatened by patients' saliva/blood during dental procedures with infectious diseases" are the aspects where most of the participants have the negative attitude. On the other hand, the aspect where the participants showed the most positive attitudes were observed on whether "fear and concern of being infected with HIV/AIDS is one of the reasons to refuse infected patients".

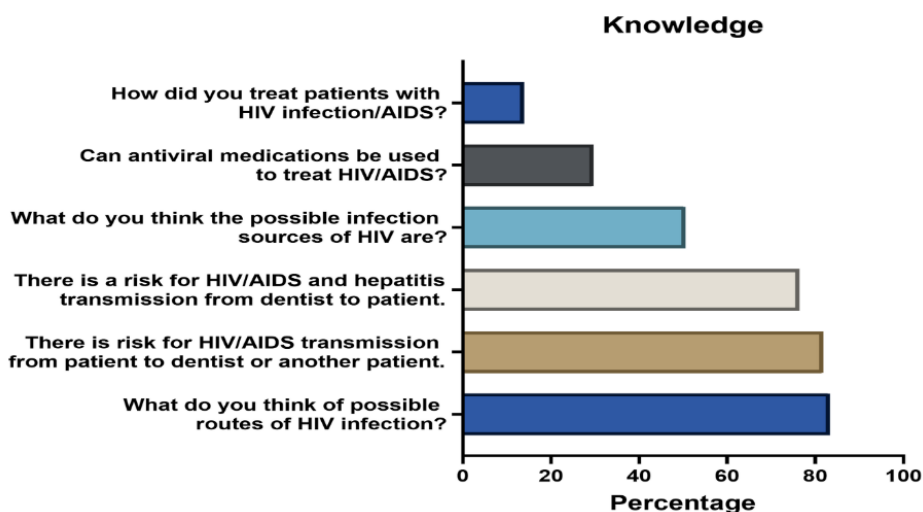


Fig. 1. Knowledge profile

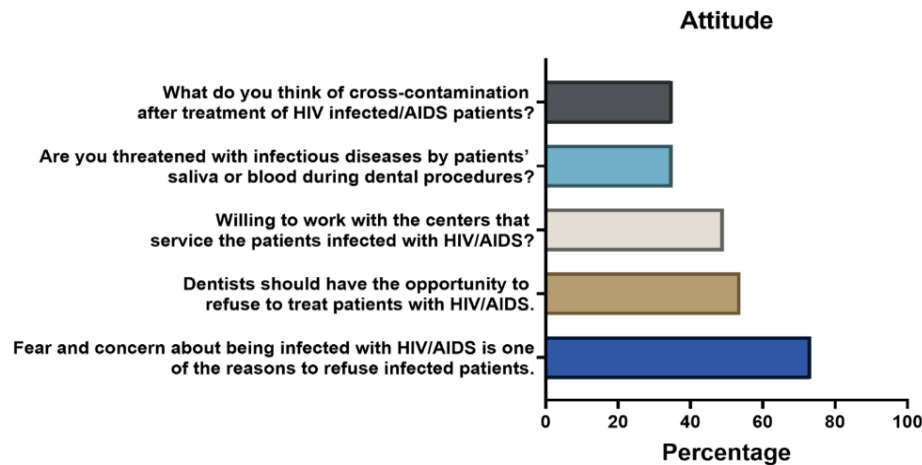


Fig. 2. Attitude profile

Demographics association to Knowledge and Attitude Score To determine whether the participants' level of knowledge and attitude towards HIV/AIDS is affected with demographic aspects, statistical analysis was conducted. In this study results revealed that both the level of knowledge and attitude of the participants were significantly different based on the city where the participants come from ( $p < 0.001$ ). Furthermore, participants from Jeddah showed the highest knowledge score (62.04, SD +/- 15.8) while the lowest knowledge score (45.10, SD +/- 20.2) was observed in Sakaka. However, further analysis found that certain knowledge aspects of the participants from Jeddah and Jazan are significantly different from Dammam, Hail and Sakaka. With regards to the attitude, the highest positive score was observed from participants in Jeddah (61.11, SD +/- 20.6) again while the lowest score was observed from the participants in Hail (40.95, SD +/- 18.7). In addition, participants from Riyadh, Hail and Jeddah were further found to have significant differences in terms of their attitude towards HIV/AIDS.

#### Experiences and Sources of Information Association to Knowledge and Attitude Score:

The knowledge and attitude of the participants were also analyzed against some experiences and sources of HIV/AIDS information. The level of knowledge was found significantly different based on the experience of the participants in treating patients with HIV infection/AIDS ( $p = 0.028$ ). Highest knowledge score (62.12, SD +/- 24) was found to participants having treatment experienced to 6- 10 patients while the lowest knowledge score (51.95, SD +/- 18.8) was found to participants without this experience and not open for any possibility. A significant difference in

certain knowledge between participants without experience who are open to possibility of treatment from those without experience but close to the possibility of treatment was also found. Concerning other factors, in this study the attitude of the participants towards HIV infection/AIDS were found to be significantly different based on the number of times the participants were pricked by sharp dental instrument ( $p = 0.005$ ) and whether the students of dental college consider HIV/AIDS as an important disease for KSA and for the world ( $p < 0.001$ ). Moreover, there was a significant difference on the attitude score when the participants had experience of being pricked less than five (5) times from those without experience at all. Similarly, there is a significant difference in the attitude of participants who agree "that students of dental college consider HIV/AIDS as an important disease for KSA and for the world" and those who don't agree.

#### 4. DISCUSSION

HIV is a global disease that has a negative influence on patient quality of life and is becoming more common [7]. AIDS affects around 38 million people worldwide, making it one of the most epidemic diseases in modern history [8]. HIV spreads through the exchange of infected bodily fluids via contaminated needles. If left untreated, HIV usually develops to AIDS within a few years. Because HIV/AIDS is a chronic condition, there are greater chances to meet HIV/AIDS patients in dentistry clinics [9]. Many national and international studies have been conducted to assess dentistry students' and practitioners' knowledge and attitudes concerning the care of HIV-positive individuals.



The purpose of this study was to analyze the knowledge and attitudes of dental students and dentists in Saudi Arabia about HIV/AIDS. A self-administered closed-ended questionnaire was used as a study tool based on previous studies [4,10].

The results of this study revealed that the average degree of knowledge was moderate, indicating that the participants had a good understanding of how HIV infection develops. Approximately 50.5 percent of dental students and dentists are aware that blood might be a source of HIV transmission. Many of the participants, however, were unaware that the virus could not be transmitted by saliva. Dental care providers are often hesitant to treat HIV/AIDS because they are unaware that the viral load in the saliva is so low that it cannot spread the infection [15-17]. Furthermore, numerous researchers have found that saliva is not a source of infection. Inhibition of HIV1 in the oral cavity is aided by crude salivary mucus and purified salivary mucins (Peacocke et al., 2012). In addition, the study found that dentists had sufficient expertise to sustain good infection control and HIV/AIDS therapy. However, as much as they treat healthy people, respondents claimed they avoid active treatment or referrals. Around 83.3% of the respondents were confident in their knowledge of the virus's infectious mechanism. Some of them, however, have no prior experience treating these patients.

In terms of the correlation between knowledge, attitudes with cities, participants from Jeddah rated highest in terms of knowledge and attitude. The exposure to a large number of patients and the variability of cases could be one explanation for these variances. This finding has only confirmed our confidence that the more interactions there are, the more positive the attitude becomes. It also emphasizes the need of providing knowledge, particularly to participants from other cities. The study's findings revealed that dental school supplied the greatest amount of knowledge. This implies that it is the most effective strategy to keep health-care workers informed about new issues. Friends, on the other hand, are relied upon less as a source of knowledge. Participants who were frequently infected by a sharp needle injury showed behavioral changes and an unfavorable influence on how they acted toward patients, with those injured more than five times having a higher effect. Fear of being injured could be the source of such negative attitude. In addition, our study

showed that a practitioner's understanding of HIV patient management is closely linked to the number of patients they treat; practitioners who treat 6-10 patients have the highest knowledge score. Certainly, this is not the case for students who treat 1-2 patients per day on average and have little exposure to and experience with them.

Eighty nine percent of our respondents never treat an HIV patient that has been identified. Our findings are similar to those of Jung-Chul Park et al., who found that 93% of participants answered the same for this question [4]. According to 73% of the respondents, fear is one of the reasons [18]. It has been evidenced that the risk of HIV infection in the workplace is low. After a percutaneous exposure incidence, the risk of transmitting the virus from HIV-infected blood is regarded very low [19]. It's only 0.3%, therefore they should all keep their fears in control and treat HIV patients professionally and without discrimination [19]. This is also reflected in the refusal percentage of providing treatment to HIV patients. It was 25.8%, somewhat higher than a survey of dentistry students conducted in Kuwait, where we had 25.8% compared to 34.5% in that study [20]. Furthermore, when compared to Nigeria, a country with a large AIDS patient population, the refusal rate of dentistry students to treatment is around 41% [19]. This could be due to many factors, including a lack of understanding of patients' rights or a higher likelihood of having HIV patients in their clinics. Surprisingly, only 53.8% of our participants agreed that giving dental care for HIV patients is required by law, which is greater than a Malaysian study that found only 27.7% believe they should treat HIV patients [20]. However, the World Health Organization (WHO) ruled in 1988 that dentists are required to treat HIV patients [21]. Because of recent advancements in HIV medical therapy, HIV infection has been transformed from a lethal and terminal disease to a chronic illness that requires continuing maintenance and careful monitoring. Despite having a moderate level of knowledge, dentists and dental care personnel have a negative perception. We must protect our patients from any psychological injury, which necessitates the implementation of discrimination and patient rights awareness programs. It should be necessary for all health care workers, not just dentists and dental students. The majority of HIV/AIDS research falls into this category. They looked at attitudes in relation to knowledge levels and came to the conclusion that more continuous education is required to improve negative

attitudes [4]. This is why we have multiple study groups ranging from fourth-year dental students to practicing dentists to determine which groups have less knowledge and are more negative. This could be beneficial if we concentrate on the groups with the lowest knowledge and attitude scores. Another advantage of our study is that it spans seven cities in Saudi Arabia, allowing us to enroll students from a variety of institutions. Rather than covering just one town or college, this provides a more comprehensive perspective. Our study, however, has certain limitations. The number of people that are taking part is quite small. More research has to be done with larger sample numbers.

## 5. CONCLUSION

Between dental students and dentists, there was a substantial lack of knowledge and attitude, with insignificant variances. More education on AIDS patients is needed in our dentistry community. Health seminars, service training, continuing education, school curricula, and other activities would provide the most efficient and effective ways of spreading HIV/AIDS awareness. Hence, a more positive attitude toward the treatment of these patients is expected.

## CONSENT AND ETHICAL APPROVAL

All participants provided written consent, and the ethical approval was granted by the Research Ethics Committee at Hail University in Hail, Saudi Arabia.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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