

HIV/AIDS: KNOWLEDGE AND ATTITUDES OF FIRST AND SECOND YEAR
INDIAN DENTAL STUDENTS

A THESIS

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To the Dean of the Graduate School:

I am submitting herewith a thesis written by Priyanka Lalwani entitled "HIV/AIDS: Knowledge and Attitudes of First and Second Year Indian Dental Students." I have examined this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science with a major in Health Studies.



Dr. Susan Ward, Major Professor

We have read this thesis and recommend its acceptance:





Department Chair

Accepted:



Dean of the Graduate School

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ABSTRACT

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HIV/AIDS: KNOWLEDGE AND ATTITUDES OF FIRST AND SECOND YEAR INDIAN DENTAL STUDENTS

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The increased likelihood of HIV/AIDS infection reaching epidemic heights in South-East Asian countries like India makes it crucial for health care workers, including dentists, to be well informed and adequately prepared to encounter this challenge. Dentists can play an important role in the early diagnosis and detection of HIV/AIDS as many patients present with intra-oral manifestations of the disease (Gerbert, 1987). The attitudes of dental students with regard to AIDS are of prime importance because dental students represent the future of the profession. The purpose of this study was to assess the knowledge of and attitudes related to HIV/AIDS of first and second year Indian dental students. A sample of 66 first and second year students enrolled at Government Dental College and Hospital (GDC&H) in Mumbai, India participated in the study. A survey questionnaire developed by the researcher was utilized to collect data for the study. The findings of this study present insight on how well the dental students are prepared to deal with the HIV/AIDS epidemic in India and what additional efforts are warranted in this direction.

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CHAPTER I

INTRODUCTION

Since the diagnosis of the first Acquired Immunodeficiency Syndrome (AIDS) case in 1981, more than 20 million people have died worldwide and 38 – 40 million are Human Immunodeficiency Virus (HIV) positive. No region in the world has been spared by this deadly epidemic. Home to 60% of the world's population, Asia is fast becoming the center of the epidemic. In Asia, an estimated 7.4 million are currently reported to be HIV positive and in 2003, nearly half a million Asians succumbed to AIDS (UNAIDS, 2004).

In 2003, India accounted for 5.1 million HIV positive cases, the largest number outside of Africa (UNAIDS, 2004). These numbers are likely to be underrepresented because population-based surveys have yet to be conducted in the country. As the population of India grows, so will the number of HIV/AIDS cases. India is currently in a similar position that Africa was almost 15 years ago. By 2010, India may well surpass Africa in the number of HIV/AIDS cases. According to Peter Piot of UNAIDS, "The future of the global epidemic is really at stake in India" (Arora, Cyriac & Jha, 2004). According to epidemiologists who have studied AIDS in Africa, Europe, Asia, and the United States, the Indian epidemic, although in its primitive stage, already has HIV positive numbers thrice that of the United States and ten times that of Europe (Ninian, 2000). A complex variety of factors including denial and stigmatization about

HIV/AIDS, inadequate knowledge, discrimination against women, poverty and illiteracy, weakened health care system, and population explosion, all have been responsible for the escalating HIV/AIDS number in India (Bhattacharya, 2001). One can foresee that the HIV/AIDS epidemic will continue to pose significant challenges to health care professionals, especially in developing countries like India and China, thus leading to an increased utilization of health care services in these countries.

Dentists, like other health care professionals, have also experienced the impact of the disease, especially with the negative publicity and controversy created by the 1991 case of a Florida-based dentist who was held responsible for the transmission of HIV to six of his patients (McCarthy & Koval, 1996). Dentists can play an important role in the early diagnosis and detection of HIV as many patients present with intra-oral signs such as oral candidiasis, hairy leukoplakia, HIV-associated gingivitis and periodontitis. A pathognomonic sign of AIDS is the presence of Kaposi's sarcoma in the mouth - a lesion that has been detected in the oral cavity of more than 51% of the AIDS patients. Since many of the HIV-associated lesions occur in and around the oral cavity, dentists should be knowledgeable of these clinical manifestations. Therapeutic treatment can be administered if HIV infection is detected in its early stages (Gerbert, 1987).

Although the risk of contracting HIV infection in the dental clinic is very slim, dentists continue to exhibit negative attitudes like fear of and reluctance to treat HIV positive patients (Cohen & Grace, 1989). Reported incidences have shown refusal of care and also inappropriate treatment practices while handling HIV positive patients despite explicit guidelines from governing bodies (McCartan & Samaranayake, 1991).

The attitudes of dental students with regard to AIDS are of prime importance because dental students represent the future of the profession. If dental students are not confident about the knowledge of the disease, and are not adequately prepared to treat HIV positive patients, then curbing the growth of the epidemic in countries like India, will be questionable.

Rationale

In light of evidence that the number of HIV/AIDS cases are continually on the rise in developing countries like India, health care professionals including dentists need to be adequately prepared to combat the epidemic. Dental students and dentists have a significant role to play in the battle against HIV/AIDS. Although it is well known that the chances of acquiring HIV infection in the dental clinic is rare and only one such incidence of transmission has been reported so far, dentists continually refuse care to HIV/AIDS patients. As the numbers of individuals infected by the virus continue to rise, dental students and dentists will encounter many more HIV positive cases in their clinical practice than ever before. Thus, it is imperative that dental students acquire adequate knowledge and develop skills to better diagnose and effectively manage HIV/AIDS patients in their clinics (Oliveira, Narendran & Falcao, 2002).

Minimal research has been conducted in developing countries like India to assess the knowledge and attitudes of dental students and dentists in relation to HIV/AIDS. Furthermore, results from the very few studies that have been conducted indicate a definite lacuna in the knowledge of HIV/AIDS among health care workers, including dentists (Nair, Samaranayake, Bhat & Anil, 1995). Adequate knowledge of HIV/AIDS

and accurate perception of associated personal risks will effectively contribute to more positive professional attitudes of dental students and dentists (Chehaitly & Alary, 1995). This in turn, will lead to appropriate, safe, and ethical treatment of all dental patients including those who are HIV positive. Therefore, research that attempts to assess the knowledge and attitudes of dental students toward HIV/AIDS is warranted.

Statement of Purpose

The purpose of this descriptive study was to assess the knowledge of and attitudes related to HIV/AIDS of first and second year dental students enrolled at Government Dental College and Hospital (GDC&H) in Mumbai, India.

Research Questions

The following three research questions were addressed by this descriptive study:

1. What are the sources of information on HIV/AIDS of first and second year dental students enrolled at GDC&H in Mumbai, India?
2. What is the knowledge of HIV/AIDS of first and second year dental students enrolled at GDC&H in Mumbai, India?
3. What are the attitudes related to HIV/AIDS of first and second year dental students enrolled at GDC&H in Mumbai, India?

Hypotheses

The following null hypotheses were tested at the .05 level of significance:

1. There is no significant difference in the overall knowledge level of HIV/AIDS between male and female dental students enrolled at GDC&H in Mumbai, India.

2. There is no significant difference in the overall attitudes toward HIV/AIDS between male and female dental students enrolled at GDC&H in Mumbai, India.
3. There is no significant difference in the overall knowledge level of HIV/AIDS between first and second year dental students enrolled at GDC&H in Mumbai, India.
4. There is no significant difference in the overall attitudes toward HIV/AIDS between first and second year dental students enrolled at GDC&H in Mumbai, India.

Definition of Terms

Knowledge – “Familiarity, awareness, or understanding gained through experience or study” (Morris, 1981, p.725).

Attitudes - “A relatively constant feeling, predisposition, or set of beliefs directed towards an object, person, or situation” (Green and Kreuter, 2005, p.159).

Human Immunodeficiency Virus (HIV) - is a retrovirus that breaks down the body’s immune system leaving the victim vulnerable to a variety of opportunistic infections or malignancies.

Acquired Immunodeficiency Syndrome (AIDS) - is the terminal stage of HIV infection, and has poor prognosis.

Delimitations

The study was subjected to the following delimitations:

1. The study was restricted to the first and second year dental students enrolled at GDC&H in Mumbai, India.

2. The study was restricted to participants who were 18 years and older.
3. The survey questionnaire designed to assess knowledge and attitudes related to HIV/AIDS, addressed questions developed by the researcher.
4. The survey questionnaire used for the study was written in English.

Limitations

The study was subjected to the following limitation:

1. As a sample of convenience was used for the study, the participants were not representative of all the first and second year dental college students in India.

Assumptions

For the purpose of the study, the researcher made the following assumptions:

1. The survey questionnaire utilized for the study was valid.
2. The participants of the study were able to read and comprehend the survey questionnaire.
3. The participants of the study provided honest responses to the survey questionnaire.

Importance of the Study

The increased likelihood of HIV/AIDS infection reaching epidemic heights in South-East Asian countries like India makes it crucial for health care workers including dentists, to be well informed and adequately prepared to encounter this challenge. As future dentists, dental students hold negative attitudes and biases toward HIV positive patients. These negative attitudes will only further aggravate the epidemic.

Medical professionals, including dentists, can provide important information about HIV, and can serve as a sentinel population to measure knowledge and attitudes regarding HIV/AIDS (Buskin, Lin, Houyuan, Tianji & McGough, 2002). In light of this, any research that attempts to assess knowledge and attitudes of dental students towards HIV/AIDS will be of great benefit to the entire health care profession.

CHAPTER II

REVIEW OF LITERATURE

The review of literature was done to provide empirical basis for the study. Very few studies have assessed the knowledge and attitudes of dental students toward HIV/AIDS. Even fewer have assessed these variables among dental students and dentists in India. Due to lack of research with dental students, the literature review will discuss studies that have assessed these variables in relation to dentists all over the world.

With almost twenty years of existence, HIV/AIDS has become one of the greatest epidemics to affect mankind. More people die of AIDS each year than any other infectious disease. HIV/AIDS has been declared as a global crisis. Over the last twenty years different strains of the virus have continued to infect humans. Although new anti-retroviral drugs have been developed to treat infected individuals, there is neither a cure for the disease nor a vaccine to prevent it (Hwang, 2001). Despite increased human efforts, HIV/AIDS numbers are continually on the rise. As of December 2003, almost 20 million people have died of AIDS and approximately 38 million people are living with the virus. In 2003 alone, almost 5 million individuals became newly infected accounting for the greatest number in one year since discovery of the virus in 1981; in the same year almost 3 million individuals died of AIDS (UNAIDS, 2004).

The epidemic varies geographically with some countries being more affected than the others, and within these countries, there seems to be variations between states,

provinces, and districts in the rate of infection (UNAIDS, 2004). Although, initially diagnosed in developed countries, the disease is now firmly entrenched in the developing countries of the world. The epidemic seems to be advancing unchecked in Asian countries like India and China. It is believed that many of these Asian countries have yet to reach the epidemiological “set point” for the disease (Cock & Weiss, 2000). In 2003, almost 0.5 million Asians died of AIDS and about 1 million people became newly infected (UNAIDS, 2004). Asian countries like India and China account for more than one-third of the world’s population, and the course of the epidemic in these two countries will dictate its future (Cock & Weiss, 2000).

Epidemiology of HIV/AIDS in India

India is not only drawing global attention because of its population explosion but also because of its deteriorating health care conditions (Patil, Somasundaram, & Goyal, 2002). The first AIDS case in India was detected in 1986 in Chennai in a commercial sex worker. Since then, the epidemic has expanded vigorously in various states and provinces of India. Although only 0.7% of its 1 billion population is HIV positive, India accounts for the maximum number of cases than any other nation in the world (Solomon, Chakraborty, & Yephthomi, 2004). As of 2004, at least 5 million Indians are estimated to be HIV positive. In the coming years, India is going to experience an explosion of HIV/AIDS cases. In 2002, the United States National Intelligence Council projected that about 20 - 25 million Indians will be living with the virus by 2010. If no effective interventions are implemented at the earliest by the Indian government, then the virus is

expected to infect almost 51 million Indians by 2015, as projected by thoroughly researched mathematical models (Arora, Cyriac & Jha, 2004).

Africa has been the center of HIV epidemic for years but now the spotlight is on India. The epidemic in India is a combination of several different epidemics seen in different parts of the country. Large number of commercial sex workers, mobile male workers (primarily truck drivers), a high prevalence of STD's, and low-reported condom use, all have contributed to the expanding epidemic. The most common route of transmission has been heterosexual contact accounting for 83% of the cases, 4% through intravenous drug use, less than 4% through blood and blood products, and about 7.5% through other modes. For the data that has been documented, infection rates are found to be higher among males (76%) than in females (23%); however infection among women is constantly on the rise in India and worldwide. About 41% of the AIDS cases are between 15 – 29 years of age group, 46% are between 30 – 44 years, and about 9% are more than 45 years old. As evident, the majority of the AIDS cases fall between 15 – 49 years of age group. Globally, this age group is the most sexually active and hence at a greater risk of contraction of the disease (Ghosh, 2002).

Denial that HIV is a serious problem, and stigmatization of HIV positive individuals are two major obstacles in India's fight against HIV/AIDS. The population of the country is escalating. A large sector of the Indian population lives below poverty line. Illiteracy (42% of Indian adults) and lack of HIV awareness among people aggravates the situation. Lack of testing centers in the rural areas leads to unsatisfactory levels of HIV/AIDS diagnosis. Discrimination against women especially in the rural areas, and

their inability to protect themselves and negotiate for safer sex, accounts for increased rate of HIV infection in this population. As a developing nation, India cannot afford to provide anti-retro viral treatment to all its infected citizens nor implement HIV/AIDS programs to their full effect. In addition, the health care workers do not have adequate education and are not confident to handle the HIV/AIDS patients (Solomon, Chakraborty, Yephthomi, 2004). Because of the tendency in the culture to believe in myths and superstitions, there is denial even amongst the health care professionals in India about the gravity of the epidemic, thereby fueling the existing condition (Ponton & Lees, 1998).

Knowledge and Attitude of health care professionals in India toward HIV/AIDS

According to a recent action-based peer implemented study conducted by the Asia Pacific Network of People Living with HIV/AIDS (APN+), major areas of discrimination was identified within the health sector in India, Indonesia, Thailand and the Philippines. Fifteen percent of the interviewed participants (N = 764 HIV positive) were denied treatment and 17% had experienced a delay in the provision of health care services (Paxton, Gonzales, Uppakaew, Abraham, Okta, Green, Nair, Merati, Thephthein, Marin, & Quesada, 2005). A strong misconception among health care professionals that HIV can be transmitted through airborne droplets, leads to refusal of treatment of many AIDS patients in private as well as government hospitals in India. Some hospitals even set aside separate wards to isolate HIV/AIDS patients (Daniel, 2003).

According to a report in the national press, a 38-year old drug addict was refused treatment by doctors at a prestigious hospital in India. In yet another instance, a patient when tested positive for HIV was relocated to an unintended isolated ward. A placard

was placed on his chest and above his bed announcing his condition, staff at the hospital refused to treat him, resulting in his death within a few hours (Ninian, 2000). In a study conducted in 1994 to assess the knowledge, attitudes and practices of Indian health care workers in relation to HIV/AIDS, it was found that 65% of the servants had not heard of AIDS, 85% of the nursing personnel did not follow the Universal Safety Precautions (USP), 13.5% of the medical residents thought that HIV was not transmitted through blood and 30% of the visiting consultants would avoid contact with an HIV positive patient (Menon, & Bharucha, 1994). Health care professionals can serve as the key force in the battle against HIV/AIDS epidemic. Inadequate knowledge and fear of contagion can negatively impact the health care professionals' attitude and treatment practices toward HIV positive patients, thereby aggravating the course of the epidemic in countries like India and China, with global implications (Paxton et al, 2005).

Knowledge and Attitudes of Dentists toward HIV/AIDS

Dentists, like other health care professionals, exhibit concerns about providing treatment to HIV/AIDS patients. Despite the slim chances of contracting HIV infection in the clinic, dentists show disturbing reluctance to treat these patients, including refusal of treatment in many instances (McCartan, & Samaranayake, 1991). Barriers to caring for HIV positive patients as expressed by dentists include - fear of contracting the infection, resistance by staff, fear of losing potential HIV negative patients, and perceived lack of adequate clinical skills (Gerbert, Maguire, Badner, Greenspan, Barnes, & Carlton, 1988). This matter is of serious concern as dentists can provide both diagnostic and therapeutic care for these patients. Many HIV positive patients present with lesions in and around the

oral cavity like oral candidiasis, oral herpes simplex, and oral hairy leukoplakia, with other head and neck manifestations in about 45% of the patients. Kaposi's sarcoma, a lesion characteristic of HIV infection can be diagnosed in the oral cavity of more than 51% of the patients who have AIDS. Accurate and early diagnosis of these lesions by the dentists can lead to therapeutic treatment of AIDS patients (Gerbert, 1987). As the incidence of HIV infection continues to rise, dentists will encounter many more HIV positive patients in their clinical practice. Thus, it becomes imperative to monitor knowledge of and attitudes related to HIV/AIDS held by dentists.

In a study conducted with California dentists to ascertain their attitudes, knowledge and behavior regarding infection control and HIV/AIDS, it was found that dentists demonstrated moderate knowledge about HIV/AIDS and nearly three-quarter of the dentists were reluctant to treat AIDS patients (Gerbert, 1987). In a similar study conducted among dentists in Ireland, it was found that one half of the respondents reported saliva as a route of transmission for HIV and around 10% respondents identified insect bites and hairdressers as a source of transmission. Forty -eight percent of these respondents informed that they would implement additional precautionary measures in the treatment of family and friends of HIV positive patients (McCartan, & Samaranayake, 1991). Inadequate knowledge instills more fear about the infection, affecting the attitude and behavior of dentists toward treatment of HIV/AIDS patients.

Since the identification of the first AIDS case in 1981, more scientific information is available in terms of nature and transmission of the virus. In spite of this, dentists fail to demonstrate adequate knowledge. In a recent study conducted in 2003, 46% of the

dentists in South Cheshire in United Kingdom (UK) incorrectly identified saliva as a mode of transmission of HIV in the dental clinic. A few others incorrectly identified mucus, tears and sweat which suggest that there is still a considerable uncertainty about the infection (Crossley, 2004). If the dentists in developed countries like the United States and the United Kingdom demonstrate moderate knowledge about HIV, the knowledge level of dentists in developing countries like India and China becomes questionable.

In a study conducted in 1999 to assess knowledge and attitudes of Chinese dentists toward HIV/AIDS, it was disturbing to note that 40% of the dentists had poor knowledge of the infection and believed that HIV could not be transmitted via blood. Almost 80% of these respondents identified saliva as a main mode of transmission of the virus. Eighty five percent of the dentists did not sterilize the handpieces while treating patients (Du, Jiang, Wu, & Bedi, 2002).

Knowledge and Attitudes of Indian Dentists toward HIV/AIDS

Very limited research of this nature has been conducted with the dental population in India. It is disturbing to note that the researcher could trace only one such study that assessed the knowledge and attitudes of Indian dentists and clinical dental students toward HIV/AIDS. Sixty nine percent of the respondents of this 1994 study estimated that there was more than a 1% risk of contracting HIV infection through a needle-stick injury and almost 90% of the respondents believed that the likelihood of HIV transmission in the dental clinic is very likely/likely. Around 10 – 15% did not know the answers to a large number of knowledge-based questions on HIV/AIDS (Nair,

Samaranayake, Bhat, & Anil, 1995). Extensive efforts in the education and clinical training of dentists toward HIV/AIDS especially in countries like India are warranted.

Knowledge and Attitude of Dental Students toward HIV/AIDS

Results from all the previous investigations indicate inadequate knowledge and limited clinical training of dentists in handling HIV/AIDS patients. If dentists are not confident in their ability to treat HIV positive patients in their clinical practice, not much can be expected of the dental students. Dental students represent the future of the profession. With the rapidly increasing number of HIV cases, it is more likely that the dental students, future dentists, will encounter many more AIDS patients in their clinical practice than ever before. It is imperative that dental students acquire adequate knowledge and clinical skills, to better diagnose and treat HIV/AIDS patients. Limited studies have assessed knowledge and attitudes of dental students toward HIV/AIDS. In a study conducted with Brazilian dental students in 2002, 93% of the students believed to have an increased risk of HIV transmission in the dental clinic due to occupational exposure. More than half of these students notified that they did not have adequate information and skills to maintain optimal infection control in their university clinics. More than 96% of the dental students indicated the need for special training during their undergraduate year, for better care and management of HIV/AIDS patients (Oliviera, Narendran, & Falcao, 2002). In a noteworthy study conducted right after the Florida case of 1991, 59% of junior and senior and 50% of freshmen students at Buffalo School of Dental Medicine, New York indicated that they would not continue in dentistry if they found out they were HIV positive.

Bennett, Weyant and Simon surveyed 181 first-, second-, and fourth-year dental students at a large urban university using a 44-item self-administered anonymous survey questionnaire. Despite that fact that all the students had received sufficient HIV/AIDS education, 77% of them still believed that HIV positive patients should be treated in special care units. Almost one-third of these respondents believed that they had the right to refuse treatment to HIV positive patients (Bennett, Weyant, & Simon, 1993). Academic year in the dental school is not a strong predictor of the knowledge and attitudes of students toward HIV/AIDS. In a study conducted to examine differences in the knowledge of HIV/ AIDS between freshmen and graduating dental students, no statistically significant differences were found between the two groups in their knowledge score. However, one unusual finding of the study was the significant difference in the attitude score between the two groups, with freshmen exhibiting more favorable attitudes ($F = 6.09, p = .02$) which contradicts several other studies which indicate that students' attitudes toward HIV/AIDS improve with patient contact (Anderson, Call, & Vojir, 1994).

Summary

Limited studies that have assessed the knowledge and attitudes of dentists toward HIV/AIDS indicate inadequate knowledge and insufficient clinical training. Health care professionals including dentists are expected to have strong knowledge of the facts about HIV/AIDS but the studies show otherwise. Results from the very few studies that are done with health care professionals in India are disturbing. Health care professionals in India, including dentists, demonstrate limited knowledge on HIV/AIDS as compared to

their counterparts in other countries. Dental students, a population that needs to be well prepared to fight the battle against HIV/AIDS have been neglected. Data from the very limited studies that have assessed the knowledge and attitudes of dental students toward HIV/AIDS suggests need for changes in the undergraduate curriculum to better prepare the students for their clinical practice.

CHAPTER III

METHODOLOGY

Research focused on the assessment of knowledge and attitudes of dental students toward HIV/AIDS is scarce. Even fewer studies of this nature have been conducted in developing countries like India where HIV/AIDS poses a serious threat to the health of the nation. The primary objective of the study was to assess the knowledge and attitude of first and second year Indian dental students toward HIV/AIDS, suggest recommendations, and contribute to the body of knowledge of the medical and dental community.

Sampling

The study sample was comprised of first and second year dental students enrolled at Government Dental College and Hospital (GDC&H) in Mumbai, India. Dental hygiene and dental technician students were not included in the study. The study was restricted to participants 18 years and older. A total of 69 first and second year dental students volunteered for the study. Three participants were not included in the final analyses because they were under 18 years of age. Of the total 66 participants, 30 (45%) were first year and 36 (55%) were second year dental students.

Protection of Human Participants

The study proposal was reviewed by the Institutional Review Board (IRB) of Texas Woman's University (TWU) located in Denton, Texas and also by a research

review committee at GDC&H in Mumbai, India. Upon review, the study was granted exempt status by the IRB at TWU (Appendix A). Likewise, duly signed written permission to collect data was obtained from the Dean of GDC&H in Mumbai, India (Appendix B). In lieu of an informed consent of the participants, the following statement was included at the start page of the survey questionnaire, “The return of your survey questionnaire constitutes your informed consent to act as a participant in the study”(Appendix C). To assure anonymity, the researcher did not collect any identifying information such as the name or roll number from the participants.

Procedure

In January 2005, self-administered anonymous survey questionnaires were distributed to the first and second year dental students enrolled at GDC&H in Mumbai, India. The survey questionnaires were distributed at the end of a scheduled class which meant that students who were not present at that time did not receive the survey. Hence, there were differences in the participation rate of first and second year dental students. Prior to survey distribution, the researcher informed the study participants about the nature of the study. Participation in the study was voluntary and anonymous. The study participants were requested to respond with honesty to the survey questionnaire. To assure anonymity, participants were asked not to include any identifying information, such as their name or roll number on the questionnaire. The participants were notified that the return of their surveys was indicative of their informed consent to participate in the study. The completion of the survey took less than twenty minutes. The study

participants were informed to deposit their surveys in the drop-box placed outside the classroom. The surveys were collected by the researcher at the end of the day.

Instrumentation

A self-administered structured survey questionnaire was developed for the study (Appendix C). Both the knowledge and attitude items related to HIV/AIDS were developed by the researcher based on a review of literature. The survey questionnaire covered demographic data on age, sex and academic classification. The survey questionnaire also comprised of 15 closed-ended questions and 2 open-ended questions, to measure knowledge of the study participants on HIV/AIDS. The knowledge section addressed multiple-choice questions on: sources of information on HIV/AIDS, modes of transmission, risk groups, and preventive measures in the dental clinic. Participants were required to respond to the questions with a “true”, “false” or a “don’t know” response. Two open-ended questions were included in the survey to collect detailed information on the knowledge of infection control measures and also on the education and type of training the study participants had received in relation to HIV/AIDS.

The 13-item attitudinal section of the survey focused on issues related with willingness to treat HIV positive patients, ethical responsibility of dentists toward HIV/AIDS patients, willingness to work with the other dentists who are HIV positive, confidence in practicing possible universal precautions and attitude toward further education and training on HIV/AIDS. A six-point Likert scale (1 = strongly disagree, 6 = strongly agree) was utilized to determine the degree to which respondents agreed or disagreed with each attitudinal item on the survey questionnaire.

To establish content validity, the survey questionnaire was reviewed by two medical experts; a Medical doctor from India pursuing a graduate degree at TWU, and a physician at TWU Student Health Services. Upon recommendations from the expert panel, changes were incorporated in the survey questionnaire as necessary. Prior to data collection, the survey was also reviewed by the researcher's committee at TWU.

The test-retest method was utilized to measure the reliability of the instrument. The survey questionnaire was distributed at a two week's interval to 18 Indian student volunteers enrolled at TWU. The Pearson product-moment correlation coefficient was found to be 0.755. Cronbach's alpha was also computed to estimate the internal consistency of the instrument. In order to increase the value of alpha from 0.60 to 0.68, item number 15 of the knowledge section "A rubber dam should be used while treating HIV patients" was eliminated from the final survey questionnaire.

Data Analysis

Descriptive statistics were used to analyze the data. Because a majority of the data was categorical, frequencies and percentage distributions were used to describe the sample, and chi square tests of association were used to test for significance between the categorical variables. Independent sample *t* tests were also utilized to test for differences between the levels of the demographic variables on the knowledge and attitude scores.

Summary

The primary objective of the study was to assess the knowledge of and attitudes related to HIV/AIDS of first and second year Indian dental students enrolled at GDC&H in Mumbai, India. The study was well received by the participating institution. The

responses to the survey will indicate the level of knowledge and the type of attitude held by dental students in relation to HIV/AIDS. Based upon the results, specific recommendations will be put forth by the researcher that could be utilized to develop appropriate educational modules on HIV/AIDS, to better prepare the Indian dental students in the fight against HIV.

CHAPTER IV

RESULTS

The raging epidemic of HIV/AIDS in developing countries like India and China is bound to have global implications. Health care professionals, including dentists, will have a major role to play in curbing the growth of this epidemic. Research focused on the assessment of knowledge and attitudes of dental students toward HIV/AIDS is scarce. Even fewer studies of this nature have been conducted in developing countries like India, where HIV/AIDS poses a serious threat to the health of the nation. The primary objective of the study was to assess the knowledge of and attitude related to HIV/AIDS of the first and second year Indian dental students enrolled at GDC&H in Mumbai, India. A pre-tested instrument developed by the researcher was utilized for data collection.

Demographics

Of the 66 study participants, 32 (48.5%) were males and 34 (51.5%) were females. Thirty (45.5%) of these participants were first year and 36 (54.5%) were second year dental students enrolled at GDC&H in Mumbai, India. All of the 66 participants were between 18 and 21 years of age with the average age being 19 years ($SD = .84$).

Research Question # 1

Table 1 shows the sources of HIV/AIDS information as reported by the participants. Sixty four (97%) participants identified television as the prime source of HIV/AIDS information. Fifty-six (84.8%) participants identified magazines, family and

friends as highly significant sources of information. A lecturer at their school or college was reported as an important source of information by 55 (83.3%) of the study participants. Of all the sources, the internet was the least identified source with only 23 (34.8%) participants having used it to obtain information about HIV/AIDS.

Table 1

Frequencies and Percentages of Knowledge Sources

	Yes		No	
	Frequency	%	Frequency	%
TV	64	97.0	0	0.0
Internet	23	34.8	31	47
Lecturer	55	83.3	6	9.1
Magazines	56	84.8	5	7.6
Family and Friends	56	84.8	6	9.1

Note: Row frequencies not adding to 66 and row percentages not adding to 100 reflect missing data.

Research Question # 2

Research question two asked, “What is the knowledge of HIV/AIDS of first and second year dental students enrolled at GDC&H in Mumbai, India?” Participants were instructed to select either a “true”, “false” or a “don’t know” response for each of the 15 close-ended knowledge items. Non-parametric chi square tests of association were conducted to identify which items participants were more likely to answer true or false.

In addition, the proportion of correct score was calculated by dividing the number of items answered correctly by the number of items answered with either true or false. The overall knowledge score of all the participants was found to be moderate ($M = .70, SD = .09$).

Non-parametric chi square tests revealed that participants were not more likely to select the correct response than they were to select incorrect response for items 3, 10, 11, and 13 (all $ps > .05$). For Item 3, “saliva is an important source of HIV transmission in dental practice”, 33 (50.0%) of the participants selected false (correct response), while 24 (36.4%) selected true. For Item 10, “there are no intra-oral signs of HIV infection”, 22 (34.9%) participants selected false (correct response), and 19 (30.2%) participants selected true. For Item 11, “Hepatitis B is much more infective than HIV”, 29 (45.3%) participants selected true (correct response), while 21 (32.8%) participants selected false. For item 13, “double gloves should be worn while treating HIV positive patients”, 17 (26.6%) participants selected true (incorrect response), and 26 (40.62%) participants selected false (correct response) (Table 2).

The participants were more likely to choose the correct response than the incorrect response for knowledge items 2, 4, 5, 6, 7, 9, 12, and 16 (all $ps < .05$). For item 2 of the instrument, “HIV cannot be transmitted through contact with blood of HIV positive patient”, 51 (78.4%) of the participants selected false (correct response), while 14 (21.5%) selected true. For Item 4, “females are more likely to be infected with HIV/AIDS than males”, 47 (71.2%) participants selected false (correct response), while only 11 (16.7%) participants selected true. For Item 5, “people of age group 15-29 years

are at a lower risk of contracting HIV/AIDS than those of age group 5-15 years”, 51 (77.3%) participants selected false (correct response), while only 9 (13.6%) participants selected true. For item 6, “HIV infected persons can stay asymptomatic for many months or even many years”, 64 (98.5%) participants selected true (correct response), and only 1 (1.5%) participant selected false.

For Item 7, “there is a vaccine to prevent HIV transmission 59 (89.4%) participants selected false (correct response), while only 3 (4.5%) participants selected true. For Item 9, “there is a known cure for AIDS”, 51 (80.95%) participants selected false (correct response), and 11(17.5%) participants selected true. For Item 12, “latex gloves cannot provide protection against HIV”, 32 (50.0%) participants selected false (correct response), and 11 (17.18%) participants selected true. For Item 16, “dental impressions need not be washed with a disinfectant every time they are removed from the mouth of any patient”, 52 (81.3%) participants selected false (correct response), while 8 (12.5%) participants selected true (See Table 2).

Participants were more likely to choose the incorrect response than correct response for items 8, 14 and 17. For Item 8, “there is no test to detect HIV in the blood”, only 4 (6.1%) participants selected false (correct response), and 62 (93.9%) participants selected true. For item 14, “heat sterilization (autoclaving) cannot kill HIV”, 17 (26.2%) participants selected false (correct response), while 35 (53.8%) participants selected true (incorrect response). Thirteen (20%) reported that they did not know the response. For item 17, “there is more than 1 % risk of getting HIV from a needle stick injury”, only 5

participants selected true (incorrect response). Eight (12.5%) participants did not know the response.

Table 2

Frequencies and Percentages of Knowledge Item Answers

	True		False		Don't Know	
	Frequency	%	Frequency	%	Frequency	%
Item 2*	14	21.5	51	78.4	0	0.0
Item 3	24	36.4	33	50.0	9	13.6
Item 4*	11	16.7	47	71.2	8	12.1
Item 5*	9	13.6	51	77.3	6	9.1
Item 6*	64	98.5	1	1.5	0	0.0
Item 7*	3	4.5	59	89.4	4	6.1
Item 8*	62	93.9	4	6.1	0	0.0
Item 9 *	11	17.5	51	81.0	3	4.8
Item 10	19	30.2	22	34.9	22	34.9
Item 11	29	45.3	21	32.8	14	21.9
Item 12*	11	17.2	32	50.0	21	32.8
Item 13	17	26.6	26	40.6	21	32.8
Item 14*	35	53.8	17	26.2	13	20.0
Item 16*	8	12.5	52	81.3	4	6.3
Item 17*	51	79.7	5	7.8	8	12.5

Note: * $p < .05$, χ^2 test of the frequencies between those who answered true and those who answered false.

Research Question # 3

Research question three asked, “What are the attitudes related to HIV/AIDS of first and second year dental students enrolled at GDC&H in Mumbai, India?” A factor analysis of the 13 attitudinal items was proposed by the statistician at TWU. The factor analysis revealed four factors, which accounted for 68% of the variance. Items 1, 2, 4 and 5 of the attitudinal section of the instrument loaded together on one factor as they intend to estimate the willingness of the participants to treat HIV/AIDS patients, thus this factor was called “willingness”. Items 3 and 6 loaded together in to one factor as they intend to estimate the attitude of the participants toward ethical issues concerning HIV/AIDS, thus this factor was called “ethics”. Items 7, 8, 12 and 13 loaded together as one factor for they are concerned with the education and training on HIV/AIDS of the participants and their attitude towards it, so this factor was called “training”. The fourth factor concerned with the attitude of the participants toward using universal precautions in the dental clinic was comprised of items 9, 10, and 11 and this factor was called precautions”.

These four attitude subscale variables were created by averaging the scores for the items in each factor. A total attitude variable was also created by taking the average of all the attitude items. As shown in Table 3, the participants had a fairly good overall positive attitude ($M = 4.80$) toward issues concerning HIV/AIDS. The least positive attitude of the participants was towards training to deal with HIV/AIDS ($M = 4.14$); indicative that students want more training to better handle HIV/AIDS patients in the dental clinic. A very good outcome of the attitudinal section of the survey was that majority of the

students viewed the need for advocating appropriate universal precaution in the dental clinic ($M = 5.47$).

Hypothesis

Gender

Independent sample t tests were conducted between male and female dental students on their overall knowledge and attitude scores. As shown in Table 4, male and female dental students showed significant differences on their overall knowledge score, $t(64) = 2.37, p < 0.05$. Male dental students ($M = 9.34$) had a higher overall knowledge score about HIV/AIDS than female dental students ($M = 8.62$).

Table 3

Average Attitude Scores

	N	Mean	SD	Minimum	Maximum
Caution	61	5.47	.77	1.00	6.00
Training	62	4.14	1.03	1.00	6.00
Willingness	62	4.76	1.07	1.00	6.00
Ethics	62	5.19	.96	2.00	6.00
Total Attitude	62	4.80	.47	3.31	5.69

There was no statistical difference in the attitude towards precaution between male and female dental students, $t(59) = -.806, ns$, however there was a significant statistical difference between male and female dental students in the attitude towards professional training, $t(60) = -4.49, p < .01$, with female dental students ($M = 4.62$) exhibiting more positive attitudes than male dental students ($M = 3.59$). In terms of willingness to treat HIV/AIDS patients, there was no significant statistical difference between male and female dental students, $t(60) = 1.33, ns$.

Likewise, there was no statistical difference between male and female students in their attitude towards ethical responsibility for HIV/AIDS patients, $t(60) = -.230, ns$. Male and female dental students did show a significant statistical difference in their overall attitude scores, $t(60) = -2.09, p < .05$, with females ($M = 4.91$) exhibiting a more positive overall attitude than male dental students ($M = 4.67$).

Table 4

Average Knowledge and Attitude Scores for Male (N = 32) and Female (N = 34) Dental Students

Variable	Mean	SD	<i>t</i>	<i>p</i>
Knowledge			2.37	.021
Male	9.34	1.70		
Female	8.62	1.76		
Attitudes				
Caution			-.81	.424
Male	5.38	.97		
Female	5.54	.54		
Training			-4.49	.000
Male	3.59	1.02		
Female	4.62	.77		
Willingness			1.33	.188
Male	4.96	.91		
Female	4.60	1.18		
Ethics			-.23	.819
Male	5.16	.99		
Female	5.21	.95		
Total			-2.09	.041
Male	4.67	.52		
Female	4.91	.40		

Academic Level

Independent sample *t* tests were also computed to assess if there were any significant differences between first and second year dental students. As shown in Table 5, there was no statistical difference between first and second year dental students in their overall knowledge score, $t(64) = -.66, ns$. Likewise, no statistical difference was found in terms of their attitude towards precaution, $t(59) = .83, ns$.

In addition, both first and second year dental students showed no statistical difference in their attitude towards training, $t(60) = .004, ns$, and their attitude towards willingness to treat HIV/AIDS patients, $t(60) = -.58, ns$. No statistical difference was found between first and second year dental students in their attitude towards ethical responsibility for HIV/AIDS patients, $t(60) = -.41, ns$. There was no statistical difference in the overall attitude towards HIV/AIDS patients between first and second year dental students, $t(60) = -2.46, ns$.

Table 5

Average Knowledge and Attitude Scores for First Year (N = 30) and Second Year (N = 36) Dental Students

Variable	Mean	SD	<i>t</i>	<i>p</i>
Knowledge				
First	.70	.08		
Second	.71	.10		
Attitudes				
Caution			.83	.412
First	5.55	.93		
Second	5.38	.58		
Training			.00	.997
First	4.14	.90		
Second	4.14	1.16		
Willingness			-.58	.566
First	4.68	1.05		
Second	4.84	1.10		
Ethical			-.41	.683
First	5.13	1.09		
Second	5.23	.84		
Total				
First	4.78	.50		
Second	4.81	.46		

In response to the open ended question on the important universal precautions that they would take in the dental clinic, a large majority of the students listed the use of gloves (33%), use of disposable syringes (35%) and sterilization of instruments (15%) during clinical practice.

In response to the question on the type of education and training on HIV/AIDS that they had received; 15% of the students had not received any training and education, 6% of the students had received some education in class Ten and 3% of the students had received some education in class Twelve, another 3% identified media sources like television and posters as their mode of education; however a large majority of the students (73%) did not respond to the question.

Summary

The present study provided descriptive and analytical data regarding the knowledge and attitudes toward HIV/AIDS of the first and second year dental students enrolled at GDC&H in Mumbai, India. The results showed that the overall knowledge of the participants about HIV/AIDS was moderate. It was uplifting to see that the participants had an overall positive attitude toward various issues concerning HIV/AIDS. The academic level in the dental school did not seem to make a difference on the knowledge and the attitude scores as one would expect. The female dental students exhibited lower knowledge and better attitudes toward issues concerning HIV/AIDS as compared to their male counterparts. The findings of this study may present insight on how well the dental students are prepared to deal with the HIV/AIDS epidemic in India and what additional efforts are warranted in this direction.

CHAPTER V

SUMMARY, CONCLUSIONS, DISCUSSION AND RECOMMENDATIONS

The HIV/AIDS epidemic continues to evolve in both magnitude and diversity. Initially diagnosed in developed countries, it is now rapidly spreading in Asian countries like India and China. Health care professionals including dentists are likely to encounter many more HIV positive cases in their clinical practice than ever before. Knowledge and attitudes of these professionals toward HIV/AIDS will largely impact the containment of the epidemic.

Summary

Published research suggests that the HIV/AIDS infection is rapidly spreading in developing countries like India and China, posing a serious challenge for the health care professionals including dentists. The primary purpose of the present study was to assess the knowledge of and attitudes related to HIV/AIDS of first and second year Indian dental students enrolled at Government Dental College and Hospital (GDC&H) in Mumbai, India. The sample included 30 first year and 36 second year GDC&H dental students. All of the study participants were between 18 and 21 years of age. Data was collected using a survey questionnaire developed by the researcher. For the 15 knowledge-based items on the survey, participants were required to select either a “true”, “false” or a “don’t know” response. Two open-ended questions were also included in the survey to investigate participants’ knowledge on infection control measures and the type

of HIV/AIDS education and training they had received. For the 13 attitudinal items on the survey, a six-point Likert scale was utilized and the participants were required to either agree or disagree with the attitude expressed in the item. The content validity of the survey was established upon review by a panel of experts at TWU and the reliability by a test-retest method using 15 Indian student volunteers enrolled at TWU in Denton, Texas. Descriptive statistics were utilized to analyze the data.

Conclusion

The following three research questions were addressed by this descriptive study:

1. What are the sources of information on HIV/AIDS of first and second year dental students enrolled at GDC&H in Mumbai, India?
2. What is the knowledge of HIV/AIDS of first and second year dental students enrolled at GDC&H in Mumbai, India?
3. What are the attitudes related to HIV/AIDS of first and second year dental students enrolled at GDC&H in Mumbai, India

Sixty four (97%) participants identified television as the prime source of HIV/AIDS information. Of all the sources, the internet was the least identified source with only 23 (34.8%) participants having used it to obtain information about HIV/AIDS. The overall knowledge of HIV/AIDS among first and second year dental students was found to be moderate ($M = .70$, $SD = .09$). The students demonstrated an overall fairly good positive attitude ($M = 4.80$) toward issues concerning HIV/AIDS.

The following null hypotheses were tested at the .05 level of significance:

Hypothesis 1. There is no significant difference in the overall knowledge level of HIV/AIDS between male and female dental students enrolled at GDC&H in Mumbai, India - Male dental students had an overall higher knowledge score ($M = 9.34$) about HIV/AIDS than female dental students ($M = 8.62$) enrolled at GDC&H in Mumbai, India.

Hypothesis 2. There is no significant difference in the overall attitudes toward HIV/AIDS between male and female dental students enrolled at GDC&H in Mumbai, India - Female dental students demonstrated an overall higher positive attitude ($M = 4.91$) related to HIV/AIDS than the male dental students ($M = 4.67$) enrolled at GDC&H in Mumbai, India.

Hypothesis 3. There is no significant difference in the overall knowledge level of HIV/AIDS between first and second year dental college students enrolled at GDC&H in Mumbai, India - There is no significant difference in the overall knowledge level on HIV/AIDS between first and second year dental students ($t(64) = -.66, ns$) enrolled at GDC&H in Mumbai, India.

Hypothesis 4. There is no significant difference in the overall attitudes toward HIV/AIDS between first and second year dental college students enrolled at GDC&H in Mumbai, India - There is no significant difference in the overall attitude toward HIV/AIDS between first and second year dental students ($t(60) = -2.46; ns$) enrolled at GDC&H in Mumbai, India .

Discussion

Television was found to be the most important source on HIV/AIDS information as reported by the dental students. Undoubtedly, media has always played a strong role in raising awareness on various health issues. However, it has not been utilized to the full potential in delivering important information on HIV/AIDS especially in India.

Television viewing has greatly increased in India and therefore HIV/AIDS related messages should be intensively broadcast on the television and other media sources as a part of an extensive national prevention campaign (Lalvani, & Jayanthi, 1996). Internet was found to be the least utilized source of information on HIV/AIDS as reported by dental students. Limited use of technology in classrooms could be cited as a possible reason. Magazines, family and friends were also identified as significant sources. However, the effectiveness and the accuracy of information obtained through these sources, and the receptivity of dental students, is open to question in view of the moderate knowledge score obtained by the students. Additional research is warranted to assess the effectiveness of the critical sources utilized to transfer knowledge to health care professionals on HIV/AIDS.

The moderate knowledge score of the participants on HIV/AIDS is disconcerting. Inadequate knowledge can act as a barrier to appropriate treatment of HIV positive patients in the dental clinic. Infected blood and blood products are the major source of HIV transmission. It was disturbing to know that 22% of the study participants did not know this fact; yet another 36% of the participants identified saliva as a source of HIV

transmission in the clinic. Research has shown that saliva contains HIV at a much lower titer than blood and also the presence of salivary antibodies and other antiviral factors in saliva minimize the risk of HIV transmission. The study participants did not have adequate knowledge on the modes of transmission of HIV in the dental clinic which indicates that this content on HIV/AIDS should be emphasized in the dental curriculum.

Dentists can detect signs of HIV infection in the oral cavity including hairy leukoplakia, Kaposi's sarcoma and oral candidiasis. Early detection of HIV can lead to therapeutic treatment of the patients (Gerbert, 1987). Thirty percent of the study participants were unaware that there were intra-oral signs of HIV infection. Inadequate knowledge on the clinical signs of HIV infection could lead to many undiagnosed HIV positive cases, thus negatively impacting the epidemic. Examination of HIV related signs should be emphasized during examination of each dental patient as many of these patients may not be aware of their HIV status (Dove, & Cottone, 1990).

Neither a cure nor a vaccine is available for HIV/AIDS. Eighteen percent of the participants were not aware of the much known fact. This implies that the study participants probably underestimate the AIDS situation. Critical information on the treatment and non-treatment modalities for HIV/AIDS needs to be included in the dental curriculum. Dentists are at a higher risk of contracting Hepatitis B (HBV) than HIV in their clinical practice. HBV is more virulent and deadlier than HIV (Driscoll, & Hoffman, 1997). Thirty three percent of the study participants were unaware of this fact. There is an extensive need for education on chronic infections like HBV along with emphasis on HBV immunization for all dental students before they start their clinical training.

Although a majority of the study participants identified use of gloves, sterilization of instruments, and use of disposable syringes and needles as universal precautions to be practiced in the clinic, 17% of the participants did not know that latex gloves could provide protection against HIV and 13% participants did not feel the need for disinfecting the dental impressions every time they were removed from the mouth of any patient. This may be due to lack of awareness of universal precautions that need to be implemented in the dental clinic. Infected blood may be transmitted from the clinic to the laboratory through the contaminated impressions (Hartshorne, Carstens, Engelbrecht, & Hattingh, 1993). In the United States, the Centers for Disease Control and Prevention (CDC) and the Occupational Safety and Health Agency (OSHA), have developed infection control guidelines for dental clinics (CDC, 1989). The American Dental Association (ADA) has also been instrumental in incorporating infection control recommendations in the dental curriculum (ADA, 1996). According to the CDC, gloves should be routinely worn while examining patients in the dental clinic. Since glove surfaces cannot be reliably and consistently cleaned of microbial contamination or may tear during treatment, they need to be changed after contact with each patient (Bagg, Jenkins, and Barker, 1990). No such guidelines are emphasized by the Indian Dental Association (IDA) and even if they have been, are not strictly adhered to by hospitals, institutions or private practitioners. Strict infection control practices should be made mandatory in every dental clinic in India and regular monitoring and evaluation of these practices need to be conducted by the IDA to ensure safety of the patients.

It is disquieting that 80% of the participants thought that there was more than a 1% occupational risk of HIV contraction in the dental clinic when in fact only one known case has been reported so far. An increased fear of contagion can negatively impact the attitudes and treatment practices implemented by the students.

The participants demonstrated an overall high positive attitude toward issues concerning HIV/AIDS. This is comforting but it cannot be relied upon because the surveys were self-report in nature. Likewise, it is not guaranteed that the attitudes expressed here will be practiced by the students in the future. The least positive attitude reported was towards the training received in relation to HIV/AIDS. A few of the study participants also expressed slight reluctance to treat HIV positive patients or work with an HIV positive dentist. The low scores are not particularly surprising because majority of these students indicated that they had not received any education and training on HIV/AIDS. It is important to note that the Indian dental students start treating patients at the end of second year. They will encounter an HIV positive patient during their clinical rotation. Inadequate education and training may jeopardize the health of many of their patients. The dental students' negative reactions toward HIV/AIDS are consistent with those reported by many other medical students, physicians and dentists (Cohen, & Grace, 1989). These findings suggest that it may be important to foster a sense of moral and ethical responsibility in the students toward HIV positive patients, and co-workers, as a part of their clinical training.

Male dental students scored higher on the knowledge level of HIV/AIDS than female dental students. There is no explanation to justify the statistical differences between the genders. However, it is interesting to note that the female dental students demonstrated a higher positive attitude toward issues concerning HIV/AIDS than the male students. This could possibly be explained by the fact that increased knowledge on HIV/AIDS is bound to engender negative attitudes until there is a complete understanding of the infection. (Chen, Han, & Holzemer, 2004). This is in contradiction to the fact that knowledge and experience reduce people's ignorance and instill positive attitude and behavior (Ponton, & Lees, 1998). The academic level in the dental school was not a predictor of the knowledge and attitude toward HIV/AIDS between first and second year dental students. The dental curriculum must incorporate extensive step-wise educational topics especially focused toward HIV/AIDS and other chronic infections during the pre-clinical and clinical school years, in order to better prepare its students to fight the epidemic.

It is important to note that the instrument used in this study did not address all of the items related to knowledge and attitudes on HIV/AIDS. Some of the items in the knowledge section of the instrument could have been better worded in a manner that best summarized the information that was to be collected. Limitations in the instrument must be overcome before it can be used for future research purposes. Despite limitations, the study can be used to identify gaps in the knowledge on HIV/AIDS among dental students.

Recommendations

Based upon the results of this study and review of available literature, the researcher makes the following recommendations for future research purposes:

- Due to the seriousness of HIV/AIDS epidemic in India and China, more studies of this nature are warranted.
- A study with larger sample of the dental population extending to a majority of dental colleges in India would yield more generalizable results.
- All questions on the survey were self-report in nature. It is entirely possible that students may practice behaviors different from the attitudes they have reported.
- This study is an attempt at understanding the knowledge and attitudes of pre-clinical dental students toward HIV/AIDS. The study cannot be used to draw conclusions pertaining to whether this sample of dental students would actually provide or refuse care to HIV positive patients.
- A qualitative research instrument will be more instrumental in gathering specific and extensive information in relation to HIV/AIDS.
- Due to inadequacies documented by the knowledge and attitude scores of the study participants, an in-depth curriculum on HIV/AIDS is warranted. From the findings of the study and personal experience of the researcher as a dentist, there lies a need to amend certain aspects of the dental curriculum which will help improve dental students' patient care and management skills.

- Dental students should be encouraged to read professional journals and visit accredited online resources to enhance their knowledge on infectious diseases.
- An integral aspect of professional dental training might well include developing an understanding of and modifying negative attitudes towards HIV.

The dental profession is facing one of its greatest challenges as it attempts to deal with the HIV/AIDS epidemics. It is not surprising that the dental students reflect the same biases as dentists and physicians. Along with providing adequate knowledge, the dental schools must foster an environment that is conducive to the development of appropriate student attitudes and behaviors needed to fight this deadly epidemic. Extensive education and adequate clinical training of dental students will be an indispensable key in the clinical management of patients with or without the disease.

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APPENDIX A

Institutional Review Board Approval



Institutional Review Board
Office of Research and Sponsored Programs
P.O. Box 425619, Denton, TX 76204-5619
940-898-3378 Fax 940-898-3416
e-mail: IRB@twu.edu

November 1, 2004

Ms. Priyanka Lalwani

Dear Ms. Lalwani:

Re: HIV/AIDS: Knowledge and Attitudes of 1st and 2nd Year Indian Dental Students

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and was determined to be exempt from further review.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. Because you do not use a signed consent form in your study, the filing of signatures of participants with the TWU IRB is not required.

Another review by the IRB is required if your project changes in any way, and the IRB must be notified immediately regarding any adverse events. If you have any questions, feel free to call the TWU Institutional Review Board.

Sincerely,

A handwritten signature in black ink that reads "David J. Nichols".

Dr. David Nichols, Chair
Institutional Review Board - Denton

cc. Dr. Susan Ward, Department of Health Studies
Graduate School

APPENDIX B

Approval from the Dean of Government Dental College and Hospital
(GDC&H) in Mumbai, India

शासकीय दंत महाविद्यालय व रुग्णालय, मुंबई.
(महाराष्ट्र शासन)

Govt Dental College & Hospital, Mumbai,
St George Hospital Compound, Near C.S.T. Station, Mumbai - 400 001
Phone No. (022) 23620668, 69, 70, 23620789

No GDCHM 21/22

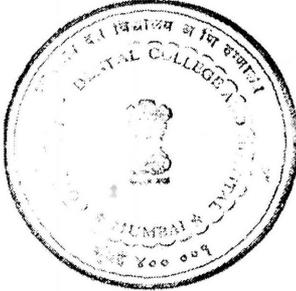
DATE: 3/7/2005

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Dr. Priyanka Lalwani has been permitted to collect data for her Master's thesis study from the 1st and 2nd year Government Dental College and hospital students as study participants.

After a brief overview of her thesis proposal entitled, " HIV/AIDS : Knowledge and attitudes of 1st and 2nd year Indian dental students, it appears that the research will in no way harm the study participants or the institution. The survey questionnaire has been approved and permitted for distribution to the study participants.

The researcher has been requested to furnish a copy of the result findings to the institution upon completion of her study.



APPENDIX C

HIV/AIDS Survey Questionnaire

HIV/AIDS SURVEY QUESTIONNAIRE

This is a survey to determine your knowledge and attitudes toward HIV (Human Immunodeficiency Virus) and AIDS (Acquired Immune Deficiency Syndrome).

Your participation in this research study is voluntary. It is very important that you respond honestly to each question. All of your answers will be kept anonymous and confidential.

Do **NOT** put your name or roll number anywhere on this survey.

The return of your completed questionnaire constitutes your informed consent to act as a participant in this research.

Please fill in the blank or check mark \checkmark in the appropriate box wherever necessary.

Age: _____ years Sex: Male Female

Academic level: 1st year 2nd year

Part A: Knowledge

Place a check mark \checkmark in the box next to your selected response. For 1, please select one response for each of the sources mentioned.

1. I have heard about HIV/AIDS from the following sources:

yes Television
 no

yes Internet
 no

yes Lecturer
 no

yes Magazines
 no

yes Family/Friends
 no

Others (please specify) _____

For 2-18, place a check mark \checkmark in the box next to your selected response.

2. HIV cannot be transmitted through contact with blood of HIV positive patient.

True
 False
 Don't know

3. Saliva is an important source of HIV transmission in dental practice.

- True
- False
- Don't know

4. Females are more likely to be infected with HIV/AIDS than males.

- True
- False
- Don't know

5. People of age group 15-29 years are at a lower risk of contracting HIV/AIDS than those of age group 5-15 years.

- True
- False
- Don't know

6. HIV infected persons can stay asymptomatic for many months or even many years.

- True
- False
- Don't know

7. There is a vaccine to prevent HIV transmission.

- True
- False
- Don't know

8. There is no test to detect HIV in the blood.

- True
- False
- Don't know

9. There is a known cure for AIDS.

- True
- False
- Don't know

10. There are no intra-oral signs of HIV infection.

- True
- False
- Don't know

11. Hepatitis B is much more infective than HIV.

- True
- False
- Don't know

12. Latex gloves cannot provide protection against HIV.

- True
- False
- Don't know

13. Double gloves should be worn while treating HIV positive patients.

- True
- False
- Don't know

14. Heat sterilization (autoclaving) cannot kill HIV.

- True
- False
- Don't know

15. A rubber dam should be used while treating HIV patients.

- True
- False
- Don't know

16. Dental impressions need not be washed with a disinfectant every time they are removed from the mouth of any patient.

- True
- False
- Don't know

17. There is more than a 1% risk of getting HIV from a needle stick injury.

í True

í False

í Don't know

18. Enumerate the important universal precautions you plan to take while treating any patient in the dental clinic.

19. Enumerate the type and year of training on HIV/AIDS that you have received.

Part B: Attitudes

For each of the following statements, please circle the number that best describes how you feel about the statement.

1 stands for strongly disagree 2 stands for moderately disagree
3 stands for slightly disagree
4 stands for slightly agree 5 stands for moderately agree
6 stands for strongly agree.

1. I will feel fear while treating HIV positive patients 1 2 3 4 5 6

2. I will be willing to treat HIV positive patients. 1 2 3 4 5 6

1. I have an ethical responsibility to treat HIV positive patients. 1 2 3 4 5 6

2. I should be allowed to refuse care to HIV/AIDS patients. 1 2 3 4 5 6

3. I am willing to work with another dentist who is HIV positive. 1 2 3 4 5 6

4. Dentists should be screened regularly for HIV. 1 2 3 4 5 6

5. I have received adequate information on HIV/AIDS. 1 2 3 4 5 6

6. I have received adequate training on infection control measures. 1 2 3 4 5 6

- | | | | | | | |
|--|---|---|---|---|---|---|
| 7. I will take all possible universal precautions while treating HIV/AIDS patient. | 1 | 2 | 3 | 4 | 5 | 6 |
| 8. I will take all possible universal precautions while treating any dental patient. | 1 | 2 | 3 | 4 | 5 | 6 |
| 9. I am confident in my ability to treat HIV/AIDS patients. | 1 | 2 | 3 | 4 | 5 | 6 |
| 12. I will need more education on HIV/ AIDS. | 1 | 2 | 3 | 4 | 5 | 6 |
| 13. I will need more training on infection control. | 1 | 2 | 3 | 4 | 5 | 6 |