A SURVEY OF HIV-RELATED KNOWLEDGE AND ATTITUDE AMONG DENTAL NURSING STUDENTS IN SOUTH WESTERN NIGERIA

***C. Azodo, *A. Umoh, **E. Ezeja, ***M. Ukpebor**
Department of *Periodontics, **Preventive Dentistry, *** Oral Surgery/Pathology,
University of Benin Teaching Hospital, Benin City, Edo State, Nigeria

Correspondence:

Dr AZODO CLEMENT
Department of Periodontics,
University of Benin,
Teaching Hospital,
Benin City.

ABSTRACT

***Objective*:** To assess HIV-related knowledge and attitude among dental nursing students in South Western Nigeria.

***Methods*:** A descriptive cross-sectional survey of the entire 97 final year dental nursing students from 4 colleges of health technology located in South Western Nigeria was conducted in University of Benin Teaching Hospital during their external clinical posting between June 2006 and June 2007. A self-administered questionnaire elicited information on demography, HIV/AIDS knowledge, source of information, interpersonal communication concerning HIV/AIDS, attitudes towards HIV testing, occupational risk perception and willingness to care for HIV patients.

***Results*:** Response rate was 91.8% (89/97). About three quarter (73%) was in 21-25 years age group**.** Male**:** Female ratio was approximately 1**:**12. The respondents' overall mean HIV/AIDS knowledge score was 13.2±1.8 out of 16 points. Level of knowledge was influenced by marital status, state of origin and sources of information ($p<0.05$). Misconceptions about transmission by mosquito bite (29.2%) and symptomatology (48.3%) existed among respondents. Fifty-five (61.8%) want HIV patients quarantined to prevent spread. The leading source of information was the electronic media 68(76.4%); minor source was the internet 7(7.9%). Interpersonal conversation on HIV/AIDS-related issues was commonly with classmates/friends (62.9%). Majority (86%) favoured compulsory HIV testing for dental nursing students. Over four-fifth (88.6%) expressed willingness to render care to HIV infected patient**.** Fifty-one (57.3%) expressed worry about HIV contagion through occupational exposure.

***Conclusion*:** Dental nursing students constitute a useful public HIV education resource but they lack in-depth knowledge of the subject. Comprehensive training to clarify existing misconceptions and reduce discriminatory behaviour is recommended.

Key words: HIV, knowledge, attitude, dental nursing students, South Western Nigeria).

INTRODUCTION

HIV/AIDS constitutes a major health problem in Nigeria. Nigeria is one of the countries worst hit by the HIV/AIDS

epidemic with about 2.99 million people currently infected[1]. The first confirmed case of HIV infection was reported in Nigeria in 1986[2]. Over a million people (≈ 1.70 million) have already died from AIDS since then and everyday about 1040 men, women and children are newly infected[1].

Oral health issues have been identified as a significant health issue in HIV-infected individuals[3-5]. Oral manifestations of HIV/AIDS, such as thrush, warts, periodontal diseases and rapidly progressing dental decay, occur in a very high percentage of people living with HIV/AIDS[6]. Oral diseases, if unchecked can lead to malnutrition and inability to adhere to life-sustaining HIV medication regimens. Oral pain and difficulty in swallowing (dysphagia) are barriers to successful treatment adherence.

HIV-infected patients, with or without knowledge of their own serologic status are seeking dental care in increasing numbers[7,8]. One out of every forty three patient visiting dental practices in Nigeria is HIV infected and may be unaware of their status[9]. Oral care in HIV infected individuals plays a vital role in improving nutritional intake[10], medication tolerance/effectiveness[11], treatment success rate and overall improvement in their quality of life[12]. An improvement in oral health of HIV positive individuals has been reported to be significantly associated with improvements in both physical and mental health[13].

Although reasonable numbers of oral health care practitioners in some parts of the world remain unwilling to render care to this patient group[14,15]. Majority of Nigerian dentist (93%) reported willingness to treat HIV infected patients while observing universal precautions[16].

The roles of dental nurses that constantly expose them to HIV contaminated blood include, assisting dentists during clinical procedures, cleaning of instruments, discarding of disposables, disinfection and sterilization. HIV can be transmitted through sharps injuries or direct contact with open wounds on the skin or mucous membranes[17]. Dental nurses (formerly dental assistants) are among healthcare workers in Nigeria most frequently affected by sharp instrument injuries[18].

The knowledge and attitude of health workers in relation to HIV is an important determinant of their willingness to care and the quality of the care they will render to HIV patient. Insufficient knowledge might cause negative attitude towards HIV-positive patients. The link between increased knowledge of the disease and improved attitudes towards patients with HIV/AIDS has been documented[19]. Increased knowledge may cause resultant reduction in nurses' fear in caring for HIV infected patients[20]. Perception of risk in relation to care of HIV positive person potentially influences the willingness to provide care[21].

There are studies assessing knowledge and attitude of HIV/AIDS among oral health care workers in Nigeria[22-24] but to date the authors are not aware of any such study on dental nursing students.

The objective of this present survey was to assess HIV-related knowledge and attitude among dental nursing students in south western Nigeria.

MATERIALS AND METHODS

The study is a descriptive cross-sectional survey of the entire 97 final year dental nursing students from four colleges of health technology. It was conducted in the University of Benin

Teaching Hospital, Benin City, Nigeria, during their external clinical posting .The names of the schools are; (1) College of Health Technology, Ijero Ado-Ekiti, Ekiti State. (2) College of Health Technology, Offa, Kwara State. (3) College of Health Technology, Akure, Ondo State. (4) College of Health Technology, Ilesa, Osun State.

Data was collected using a pretested, self-administerd questionnaire. This well structured, 36-item questionnaire elicited information on demographic characteristics, HIV/AIDS knowledge, source of information, interpersonal communication concerning HIV, attitudes towards HIV testing and people living with HIV/AIDS (PLWHA), occupational risk perception/precautions, willingness to care for HIV infected people.

Respondents' knowledge of HIV/AIDS was tested on 16 statements. The correct response was scored as one and incorrect or no responses as zero. The highest possible score was 16. Grading of knowledge was 16=Excellent, 13-15=Good, 10-12=Fair and below 10=Poor.

Participation was voluntary, participants were educated on the aim of the survey, assured of strict confidentiality of their responses, and informed consent obtained prior to questionnaire administration. The survey was undertaken between June 2006 and June 2007.

Data analysis was done with Statistical Package of Social Sciences (SPSS) version 13.0 and p value < 0.05 was considered statistical significant. Microsoft Excel (Windows 2007) was used for graph plotting.

RESULTS

Response rate

A total of 89 dental nursing students returned a completed questionnaire giving an overall response rate of 91.8%.

Demographic characteristics

The demographic characteristics of survey respondents are shown in Table 1.

About three quarter (73%) of respondents fell into 21-25years age group and majority of the dental nursing students (91.1%) were not married. Male: female ratio was approximately 1:12 (7.9%:92.1%). Eighty percent of the respondents were Christians while the remaining twenty percent were Muslims. Twelve out of every thirteen students in this survey were Yoruba. One third of respondents (33.7%) were from College of Health Technology Offa, Kwara State (FIG. I).

Table I: Demographic characteristics of the respondents

Characteristics	Frequency	Percentage
Age group		
17-20	8	9
20-25	65	73
26-over	16	18
Gender		
Female	87	92.1
Male	7	7.9
Marital status		
Singe	82	92.1
Married	7	7.9
Ethnic group		
Yoruba	82	92.1
Non Yoruba	7	7.9
Religion		
Christians	71	79.8
Muslim	18	20.2
Location of School		
Akure	19	21.3
Ijero Ado-Ekiti	14	15.7
Ilesa	26	29.2
Offa	30	33.7
Total	**89**	**100**

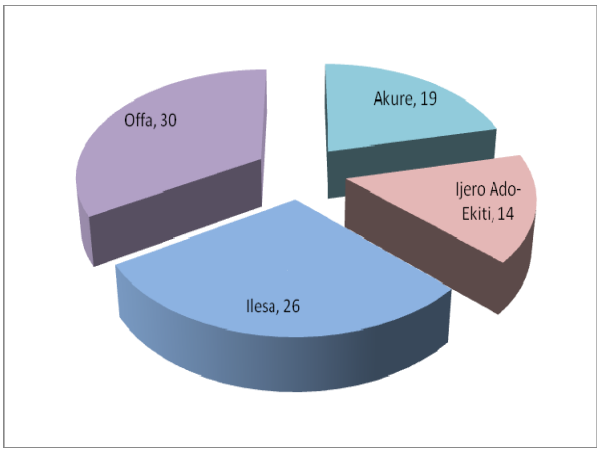

Fig. I: Respondents' School

HIV/AIDS Knowledge

There were 16 questions in the questionnaire to test their knowledge on HIV/AIDS. The respondents' overall mean HIV/AIDS knowledge score was good, 13.2 (range 9-16, SD 1.8). Overall, 10.1%, 52.8%, 36.0% 1.1% of respondents exhibited excellent, good, fair and poor knowledge of HIV/AIDS respectively (FIG. II).

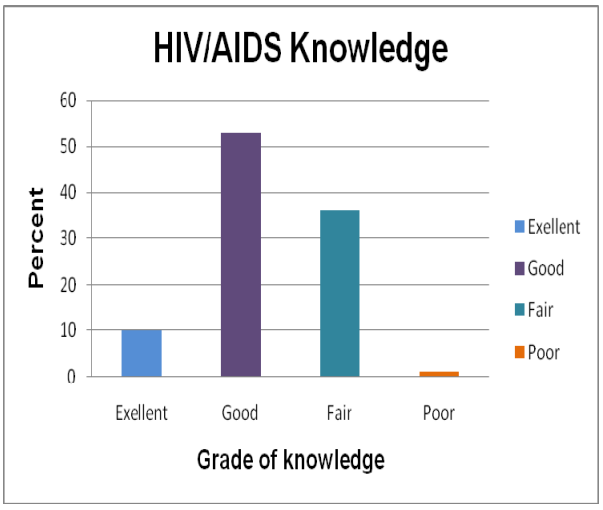

Fig. II: HIV/AIDS Knowledge

Sixty one (68.5%) of the dental nursing students knew that HIV infected patients attend dental clinic for treatment. Eighty (89.9%) of the respondents were aware that HIV transmission can occur in the dental clinic. A little less than half (48.3%) believed that all HIV positive patients look unhealthy. Sixty-six (74.2%) agreed that Highly Active Anti-Retroviral Therapy (HAART) improved the quality of life in HIV positive people. Seventy six (85.4%) of respondents were aware that there is no cure yet for HIV/AIDS. Seventy one (79.8%) of respondents knew that an appropriate vaccine for HIV does not exist. Respondents recommend the following ideas for PLWHA. Hospital HIV counselling centre (86.5%), miracle centre (10.1%), and suicide (1.1%), 2.2% failed to make any recommendation (2.2%) and none recommended traditional healer (FIG. III).

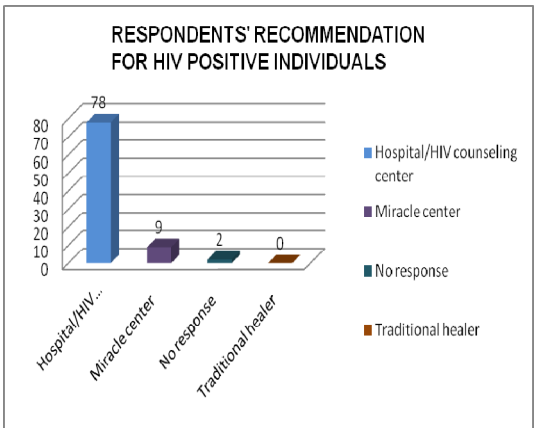

Fig. III: Recommendations

Mode of transmission

Respondents reported the following mode of transmission; unprotected sex (97.8%), breastfeeding (97.8%), blood transfusion (95.5%), unsterilized instrument (96.6%) and sharing of sharp objects (98.9%). Twenty three (25.8%) reported casual kissing as a route of transmission. Twenty six (29.2%) harboured the belief that mosquito bite can transmit HIV infection. Eighty one (91%) agreed that condom use is a preventive measure.

Married dental nursing students exhibited higher Level of HIV/AIDS

knowledge than their unmarried counterpart (p=.001). Yoruba student reported higher level of knowledge than the non-Yoruba student (p=.000). Among the Yoruba students, indigenes of Ekiti state exhibited highest mean level of knowledge

Sources of information (FIG. IV)

A list of sources of obtaining HIV/AIDS-related information was given. Most of the respondents (76.4%) reported electronic media as a major source of information, 65.2% chose magazine/newspaper, 58.4% got information from health workers, 53.9% from seminar/workshop, 36% from pamphlet/ posters, 28.1% from textbook and 7.9% from the Internet.

Those respondents that obtained HIV/AIDS information from seminar, pamphlet, and health worker reported higher level of knowledge (p=.001).

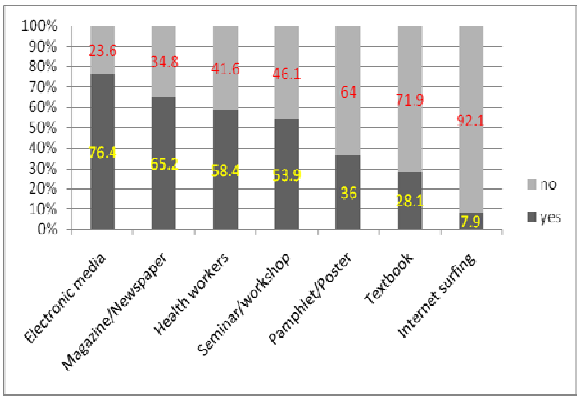

Fig. IV: Sources of Information

Interpersonal communication concerning HIV (FIG. V)

Respondents had discussed HIV-related issues most frequently with classmates/ friends (62.9%). with parents/guardian (58.4%), with partner/fiancé (52.8%), with other health workers (40.4%), with church members (39.3%), with siblings/ relatives (37.1%), with teacher/Lecturer (21.3%). Relationship between good Knowledge of HIV/AIDS and previous discussion with siblings/relatives was significant (p=.002).

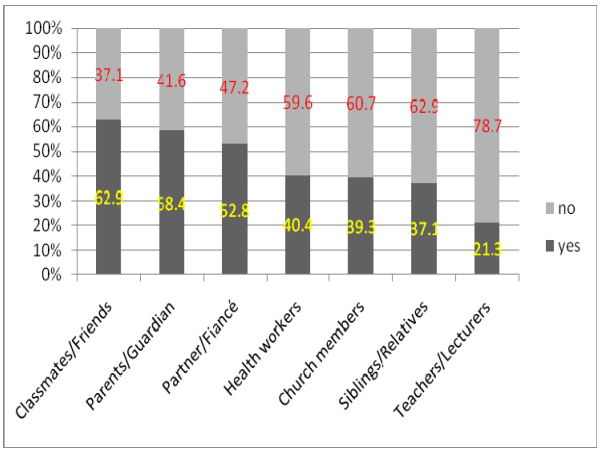

Fig.V: Interpersonal HIV/Aids Discussion

Attitudes towards HIV testing and PLWHA (FIG. VI)

Less than half (46.1%) of the respondents knew their HIV status. All respondents unaware of their HIV status expressed willingness to undergo HIV testing. Majority (86%) were of the opinion that HIV testing should be mandatory for every dental nursing student. Almost all the respondents (95.5%) were in support premarital HIV testing. Fifty five (61.8%) were of the belief that HIV patient should be quarantined to prevent spread. Sixty-two (69.7%) believed oral health workers should not be allowed to choose whether or not to provide care to HIV patients. Forty nine (55.1%) of respondents would prefer if HIV infected patient and non infected patient are treated in the same dental clinic.

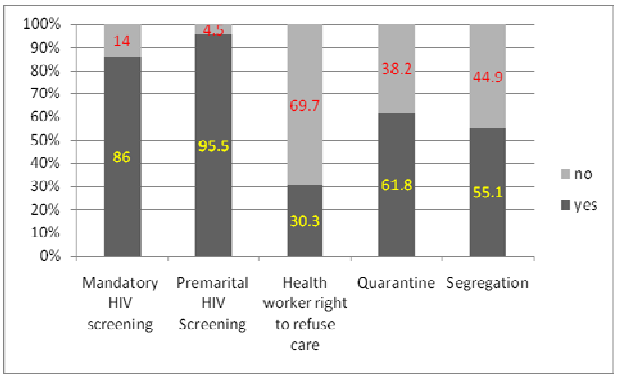

Fig.VI: Attitude to HIV Testing and PLWHA

Risk perception/precautions (TABLE II)

More than four-fifth (82%) considered working as a dental nurse a high risk group for HIV infection. Fifty one (57.3%) of respondents expressed worry about occupational HIV contagion. About two third (65.2%) expected the dentist to inform them about the status of HIV positive patient. Seventy eight (87.6%) believed that there was need for extra infection control precautions when treating HIV positive patients. Majority (93.3%) always use gloves when washing dental instruments.

Willingness to care for HIV infected people (TABLE II)

Over four fifth (88.6%) of respondents expressed willingness to participate in rendering dental care to HIV infected patient.

Table II: Risk Perception of Occupational Contagion and Willingness to Care for HIV Infected Patients

Parameter	Yes	No
Willingness to care	88.6%	11.4%
Worry about occupational HIV contagion	57.3%	42.7%
Dental Nurses are at high risk of HIV infection	83%	17%
Need for extra precaution when in care of HIV infected patient	87.6%	12.4%
Need to be informed by dentist if patient is HIV positive	65.2%	34.8%

DISCUSSION

Based on the available literature, this survey is believed to be the first documentation of HIV-related knowledge and attitude among dental nursing students in South Western Nigeria.

The response rate obtained in this survey was high and comparable to those typically reported in nursing student surveys[25,26] and higher than a few[27,28].There was a disproportionate gender distribution of respondents, male: female ratio which 1:12 (7.9%:92.1%).This dominancy of female gender may be attributed to the fact that the profession actually started as a purely female profession more than a century ago in United States of America[29]. One out of every ten respondent was not married which was consistent with the findings of a survey on female nursing students in Calabar, Nigeria[26]. The results of this survey can be interpreted as true representation of HIV/AIDS knowledge and attitude in South Western Nigeria as majority (92.1%) of respondents were Yorubas.

Nurses around the world have repeatedly reported good knowledge regarding HIV/AIDS with some misconceptions[25,30-32] which was also supported by our survey findings. The fact that a substantial proportion of dental nursing students in this survey 29.2% and 25.8% believed that HIV can be transmitted by mosquito bite and casual kissing respectively indicated that knowledge about HIV transmission is deficient and incomplete.

One (1) out of every 43 patients visiting dental clinics in Nigeria is HIV infected[9] yet only sixty one (69.3%) of the dental nursing students was aware that HIV infected patient attend dental clinic for treatment. 48.3% believed that all HIV positive patients always look sick

and unhealthy. This strongly indicates inappropriate knowledge on HIV/AIDS.

Majority (86.5%) will refer HIV infected patient to hospital and HIV counselling centre. This is acceptable and expected, as early commencement of HAART improves quality of life and reduces mortality in HIV patients. Ten point one percent of respondents recommended miracle centre, which supported the religiosity of Nigerians. Some authorities have reported benefit of HIV patient from alternative and complementary therapies[33] yet in this survey respondents failed to recommend traditional healer, reflecting their bias towards orthodox medical practice. There is a need for in- depth training on HIV/AIDS for dental nursing students, so that the information they pass to the public will be precise and accurate.

With proper knowledge and health behavior, nurses in general can play an important role in the health education of individuals and groups, and also play modeling role for lay people and the community at large[34].

Electronic media (television/radio) was identified as the major source of information on HIV in this survey which was consistent with earlier survey in Nigeria[35]. Internet surfing though a minor source of information for the respondents is a manifestation of information technology usage by health workers and should be encouraged.

Communication is very important in the prevention of HIV spread. Every aspect of the infection and its prevention must be freely discussed. Nurses' close contact with patients provides a privileged position to give spur of the moment HIV/AIDS education and screening. This need not be time consuming, but can take the form of an astute comment or gently asked question during other care-giving activities. Dental nursing students in this survey have previously discussed HIV-related issues with different categories of people thus strategically positioning them as valuable source of health information.

The respondents' support for premarital HIV testing and discussion on HIV/AIDS issue with partner/fiancé (52.8%), would be a contributory factor in uptake of voluntary HIV screening especially among the male population. Positive attitude to HIV testing among respondents is worthy of emulation by other health care workers.

HIV transmission has been reported in dental operatory[36] but its' prevalence as published in the literature is low, with the adoption of universal precaution[37]. The regular exposure to blood and blood products, due to unique nature of dental procedures and instruments, could be the obvious reason why 82% of respondents perceived working as a dental nurse, a high risk of HIV infection. Fear of infection can make health care providers react with contempt, abuse or even refuse to care for patient with HIV infection. Worry and fear about occupational HIV contagion has been identified as a serious factor affecting decision to quit nursing career[38,39]. A reasonable number (57.3%) are worried about occupational HIV contagion. This is higher than that the 22% reported among Sydney nursing students[30] but lower than 88.6% reported among dentists in Nigeria[22] and 77.4% reported among nurses in training in Cotonou, Benin Republic[40].

Universal precaution is adequate for prevention of HIV transmission in oral health care setting, yet 87.6% believe extra infection control precaution is

needed while treating HIV positive patients. This response is an obvious revelation of deficiencies in HIV/AIDS knowledge and infection control among respondents. Earlier reports documented poor knowledge about universal precautions among nurses and also its poor observance in the course of their duty[41,42].

Stigma and discriminatory behaviour hamper uptake of voluntary HIV screening, disclosure of status and dissuading PLWHA from seeking care thus promoting HIV spread. Stigma and discrimination felt by individuals are also major barriers to utilizing health services for prevention, diagnosis and treatment. Unfortunately, a number of studies have found that nurses and nursing students support the individual nurses' right to choose whether to care or not to care for person with HIV/AIDS[32,38,43,44]. More than half (55.1%) of respondents felt HIV infected should be segregated from receiving care along side non infected people, 61.8% chose quarantine as a method of controlling HIV spread and 30.3% think it should be optional for oral health care worker to render care to HIV infected people. The above reflects discriminatory potentials. Discriminatory behaviour has been documented earlier amongst health workers in Nigeria[45,46].

Over four-fifth (88.6%) of respondents expressed willingness to assist in treating HIV infected patient and this is slightly higher than the value (66%) reported in oral health workers survey in Nigera[47]. Level of HIV/AIDS knowledge in this survey was not a significant predictor of willingness to render care to HIV positive individual[31].

Limitation: All data presented in this survey was self-reported and caution should be applied in interpreting and generalizing the findings. Valid percent in frequency table was used wherever non-responses existed.

CONCLUSION

Dental nursing students of South Western Nigeria constitute a useful HIV education resource, but lack of in-depth knowledge may cause misleading information in the public. Dental nursing students need to be equipped with adequate knowledge about HIV/AIDS, thus HIV/AIDS education reinforcement in schools for dental nursing students is a sure necessity.

RECOMMENDATIONS

It is recommended that a comprehensive training of the dental nursing students be done, to promote a good delivery of accurate information on HIV/AIDS to the public and to provide proper patient care. Emphasis must be placed on In-depth discussion on HIV/AIDS issue by experienced health workers and lectures with dental nursing students in order to clarify existing misconceptions and discourage discriminatory behaviour.

ACKNOWLEDGEMENT

The authors wish to thank Mrs Madojemu F. (i/c Education Advisory Board of Nigeria Dental Nurses) for her support during the data collection and all the dental nursing students whose participation made this survey possible.
We would also like to express our special thanks to the Executive members of Association of Resident Doctor University of Benin Teaching Hospital (2006) for provision of SPSS software& training at no cost to Resident doctors.

REFERENCES

1. Federal Ministry of Health (FMOH) National HIV seroprevalence sentinel survey. Process and findings. National AIDS/STDs control programme (NASCP), Abuja. 2005

2. Nasidi A, Harry TO, Ajose-Coker OO, Ademuluyi SA, Akinyanju OO. Evidence of the LAV/HTLV III infection and AIDS-related complex in Lagos, Nigeria [poster 373]. In: Program and abstracts of the 2nd International Conference on AIDS, Paris, France, June 23-25, 1986.

3. Centres for Disease Control. Task force on Kaposi's sarcoma and opportunistic infections. Epidemiologic aspects of the current outbreak of Kaposi's sarcoma and opportunistic infections. *N Engl J Med.* 1982; 306: 248-252.

4. Tavitian A, Raufman JP, Rosenthal LE. Oral candidiasis as a marker for esophageal candidiasis in the acquired immunodeficiency syndrome. Ann Intern Med 1986; 104: 54-55.

5. Capilouto EI; Piette J; White BA; Fleishman J**.** Perceived need for dental care among persons living with acquired immunodeficiency syndrome. Med Care. 1991; 29(8): 745-754.

6. Patton LL, McKaig R, Strauss R, Rogers D, Enron JJ Jr. Changing prevalence of oral manifestations of human immunodeficiency virus in the era of protease inhibitor therapy. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2000; 89(3):299-304.

7. Silverman S. The impact of HIV and AIDS on dentistry in the next decade. J Calif Dent Assoc. 1996; 24(1):53-55.

8. Patton LL. HIV disease. Dent Clin North Am. 2003; 47(3): 467-492.

9. Arotiba JT, Odaibo GN, Fasola AO, Obiechina AE, Ajagbe HA, Olaleye OD. Human immuno-deficiency virus (HIV) infection among oral surgery patients at the University College Hospital, Ibadan, Nigeria. Afr J Med Med Sci. 2003; 32(3): 253-255.

10. Patel, ASH, Hansen, HJ. Oral health in human immunodeficiency virus patients. Topics in Clinical Nutrition. 2005; 20(3): 243-251.

11. Harvey P. HIV/AIDS: What are the implications for humanitarian action? A Literature Review. Humanitarian Policy Group Overseas Development Institute, Draft 1 July 2003

12. Brown JB, Rosenstein D, Mullooly J, O'Keeffe Rosetti M, Robinson S, Chiodo G Impact of intensified dental care on outcomes in human immunodeficiency virus infection. AIDS Patient Care STDS. 2002; 16(10): 479-486.

13. Coulter ID, Heslin KC, Marcus M, Hays RD, Freed J, Der-Martirosia C, *et al*. Associations of self-reported oral health with physical and mental health in a nationally representative sample of HIV persons receiving medical care. Qual Life Res. 2002; 11(1): 57-70.

14. El-Maaytah M, Al Kayed A, Al Qudah M, Al Ahmad H, Al-Dabbagh K, Jerjes W, *et al*. Willingness of dentists in Jordan to treat HIV-infected patients. Oral Diseases. 2005; 11(5): 318-322.

15. Crossley ML. A qualitative exploration of dental practitioners' knowledge, attitudes and practices towards HIV+ and patients with other 'high risk' groups. *Br Dent J* 2004; 197: 21-26.

16. Azodo C, Ehizele A, Umoh A, Ogbebor G. Prevention of HIV transmission in Nigeria: Role of a dentist. [Poster MOPEC011]. In: Program and abstract of the 4th International AIDS Society conference on HIV Pathogenesis, Treatment and Prevention, Sydney, Australia, July 22-25, 2007.

17. Kohn WG, Collins AS, Cleveland JL, Harte JA, Eklund KJ, Malvitz DM. Guidelines for Infection Control in Dental Health Care Settings --- 2003. *MMWR Recomm Rep* 2003; 52(17): 1-61

18. Adegboye AA, Moss GB, Soyinka F, Kreiss JK. The epidemiology of needlestick and sharp instrument accidents in a Nigerian hospital. Infect Control Hosp Epidemiol. 1994; 15(1): 27-31.

19. Kessler L, Heeren TC. Knowledge and attitude of AIDS health care provider before and after education programs. Public Health Reports 1987; 102(3): 248-253.

20. Valimaki M, Suominen T, Peate I. Attitude of professionals, students and general public to HIV/AIDS and people with HIV/AIDS: A review of the research. Journal of Advanced Nursing 1998; 27: 752-759.

21. Polgar MF. Concern, Caution, and Care: HIV Risk Perception among Hospital Nurses .Sociological Inquiry 2000; 70 (3): 253–279.

22. Sote EO. AIDS and infection control: Experiences, attitudes, knowledge and perception of occupational hazards among Nigeria dentists. Afr Dent J.1992; 6: 1-7.

23. Ogunbodede EO, Folayan MO, Adedigba MA. Oral health-care workers and HIV infection control practices in Nigeria. Trop Doct. 2005; 35(3): 147-150.

24. Obuekwe ON, Osaiyuwu O, Onyeaso CO, Ugbodaga PI. Knowledge and attitude of clinical level dental students concerning HIV/AIDS. Nig Dent J. 2007; 15:3-8.

25. Kohi TW, Horrocks MJ. The knowledge, attitudes and perceived support of Tanzanian nurses when caring for patients with AIDS. Int J Nurs Stud.1994; 31(1): 77-86.

26. Ndifon WO, Ogaji DST, Etuk SJ. Sexuality, contraception and unintended pregnancy among female student nurses in Calabar Nigeria. Benin journal of postgraduate medicine 2006; 8(1): 12-21.

27. Röndahl G, Innala S, Carlsson M. Nursing staff and nursing students' attitudes towards HIV-infected and homosexual HIV-infected patients in Sweden and the wish to refrain from nursing. J Adv Nurs. 2003; 41(5): 454-461.

28. Chelenyane M, Endacott R. Self-reported infection practices and perceptions of HIV/AIDS risk amongst emergency department nurses in Botswana. Accid Emerg Nurs. 2006; 14(3): 148-154.

29. John J. Textbook of Preventive and Community Dentistry. ed CBS publishers and distributors New Delhi India; 2003:146.

30. Stiernborg M. Knowledge about and attitudes to, HIV/AIDS among students in a Sydney nursing college. Nurse Educ Today. 1992; 12(3): 207-214.

31. Tsai YF, Keller ML. Predictors of Taiwanese nurses' intention to care for patients who are HIV positive. Clin Nurs Res. 1995; 4(4): 442-464.

32. Lohrmann C, Välimäki M, Suominen T, Muinonen U, Dassen T, Peate I.German nursing students' knowledge of and attitudes to HIV and AIDS: two decades after the first AIDS cases. J Adv Nurs. 2000; 31(3): 696-703.

33. Liu JP, Manheimer E, Yang M. Herbal medicines for treating HIV infection and AIDS Cochrane Database of Systematic Reviews 2007 Issue 4.

34. Lewis M, Gray J. HIV/AIDS: Educational needs and attitudes of nurses in the Dominican Republic. Journal of Multicultural Nursing & Health. 2003; 9(2): 59-64.

35. Oyo-Ita AE, Ikpeme BM, Etokidem AJ, Offor JB, Okokon EO, Etuk SJ. Knowledge of HIV/AIDS among secondary school adolescents in Calabar-Nigeria. Annals of African Medicine 2005; 4(1): 2-6.

36. Ciesielski C, Marianos D, Ou CY, Dumbaugh R, Witte J, Berkelman R, *et al*. Transmission of human immunodeficiency virus in a dental practice. Ann Intern Med 1992; 116(10):798–805.

37. Centres for Disease Control (CDC). Possible transmission of human immunodeficiency virus to a patient during an invasive dental procedure. MMWR Morb Mortal Wkly Rep 1990; 39: 489-493.

38. Lal P, Kumar A, Ingle GK, Gulati N. Some AIDS-related policy issues and nursing students' willingness to provide AIDS care. J commun Dis. 1998; 30(1): 38-43.

39. Juan CW, Siebers R, Wu FF, Wu CJ, Chang YJ, Chao C.The attitudes, concerns, gloving practices and knowledge of nurses in a Taiwanese hospital regarding AIDS and HIV. Int J Nurs Pract. 2004; 10(1): 32-38.

40. Fourn L, Duci S. Acquired immunodeficiency syndrome (AIDS): knowledge and fear of contagion in nursing students during their hospital training Med Trop (Mars). 1993; 53(3): 315-319.

41. Atulomah NO, Oladepo O. Knowledge, perception and practice with regards to occupational risks of HIV/AIDS among nursing and midwifery students in Ibadan, Nigeria. Afr J Med Med Sci 2002; 31(3): 223-227.

42. Ofili AN, Asuzu MC, Okojie OH. Knowledge and practice of universal precautions among nurses in central hospital, Benin-City, Edo State, Nigeria. Niger Postgrad Med J. 2003; 10(1): 26-31.

43. Berkowitz NF, Nuttall RL. Attitudes of pediatric nurses facing HIV risk. Social Sciences & Medicine. 1996; 42(3): 463-467.

44. Kermode M, Holmes W, Langkham B, Thomas MS, Gifford S. HIV-related knowledge, attitude & risk perception amongst nurses, doctors & other health workers in rural India. Ind J Res. 2005; 122: 258-264.

45. Reis C, Heisler M, Amowitz LL, Moreland RS, Mafeni JO, Anyamele C, Iacopino V. Discriminatory attitudes and practices by health workers towards patients with HIV/AIDS in Nigeria. PLos Med 2005; 2(8): 246.

46. Aisien AO, Shobowale MO. Health care workers' knowledge on HIV and AIDS: universal precautions and attitude towards PLWHA in Benin-City, Nigeria. Niger J Clin Pract. 2005; 8(2): 74-82.

47. Adedigba MA, Ogunbodede EO, Fajewonyomi BA, Ojo OO, Naidoo S. Gender differences among oral health care workers in caring for HIV/AIDS patients in Osun State, Nigeria. African Health Sciences 2005; 5(3):182-187.