Medical and dental students' willingness to administer treatments and procedures for patients living with AIDS

A Y Oyeyemi,[1] DHSc; **U S Jasper**,[2] BMR; **A Oyeyemi**,[3] PhD; **S U Aliyu**,[4] MEd; **H O Olasoji**,[5] BDS; **H Yusuph**,[6] MBBS

[1] *Department of Medical Rehabilitation (Physiotherapy), University of Maiduguri, Maiduguri, Borno State, Nigeria and Dominican College Program in Physical Therapy, Orangeburg, New York, USA*

[2] *Department of Medical Rehabilitation (Physiotherapy), University of Maiduguri, Maiduguri, Borno State, Nigeria*

[3] *Department of Physiotherapy, University of Jos Teaching Hospital, Jos, Plateau State, Nigeria*

[4] *Department of Physiotherapy, University of Maiduguri Teaching Hospital, Maiduguri, Borno State, Nigeria*

[5] *Department of Oral and Maxillofacial Surgery, University of Maiduguri Teaching Hospital, Maiduguri, Borno State, Nigeria*

[6] *Department of Medicine, University of Maiduguri Teaching Hospital, Maiduguri, Borno State, Nigeria*

Corresponding author: *U S Jasper (jaspersnd64@gmail.com)*

Background. Nearly three decades after the discovery of the human immunodeficiency virus (HIV), acquired immunodeficiency syndrome (AIDS) epidemics continue to pose significant challenges to low-income countries in sub-Saharan Africa.

Objective. To assess medical and dental students' willingness to perform specific techniques and procedures on people living with AIDS (PLWA).

Methods. A survey was done among medical and dental students (N=304) at a Nigerian University using a 21-item questionnaire that elicited responses on sociodemographic characteristics and willingness to perform specific techniques and procedures. Analysis of variance (ANOVA) and an independent t-test were used to determine the influence of sociodemographic variables. Multiple regression analyses were used to determine the predictors of willingness.

Results. The cohort of medical and dental students was willing to care for PLWA. Almost all medical students were either undecided or unwilling to perform mouth-to-mouth resuscitation. A higher proportion of dental students were either undecided or unwilling to assist during surgery, tooth extractions and other procedures they considered to be invasive. More medical than dental students were willing to carry out surgical procedures. Previous personal encounters with AIDS patients, religion, and satisfaction with instructions influenced medical and dental students' willingness to care for PLWA, while knowing a family member living with AIDS (R^2=0.22, p<0.001) was the strongest predictor of willingness to care for PLWA.

Conclusion. Extensive use of clinical clerkships and exposure through direct experience are viable strategies necessary for optimising and enhancing medical and dental students' dispositions to perform procedures and care for PLWA.

AJHPE 2014;6(1):41-44. DOI:10.7196/AJHPE.201

Nearly three decades after the discovery of the human immunodeficiency virus (HIV), acquired immunodeficiency syndrome (AIDS) epidemics continue to pose significant challenges to low-income countries in sub-Saharan Africa and to impact on the attrition rate, level of motivation, professional practices and absenteeism from work of healthcare workers.[1] About 90% of HIV infections among healthcare workers occur in developing countries, where occupational safety procedures are often neglected.[2] While a cure and an effective vaccine have not been found for AIDS, many people living with HIV/AIDS in Nigeria are still being denied access to treatment.[3-5]

It is a generally believed that, given the widespread stigmatisation of HIV/AIDS patients, even among healthcare workers, including doctors and dentists,[6,7] the behaviour towards people living with AIDS (PLWA) continues to play a vital role in care and treatment. Fear of contagion, concerns for safety, poor attitude and unwillingness to provide care to PLWA among healthcare personnel and students remain widespread.[7,8] Consequently, students' knowledge and the attitude of healthcare professionals and students towards PLWA continue to be of interest. Healthcare workers' attitude remains a core reason why many Nigerians living with HIV/AIDS are denied access to treatment.[5,9-12]

A previous study has shown that medical students in the USA believed that their education had not prepared them to safely treat PLWA,[8] and Taiwanese dental students were found to be more willing to treat hepatitis B virus (HBV)- and hepatitis C virus (HCV)-infected patients than those with HIV infection.[13] Recently, Sudanese dental students felt that they were not well prepared for their future task of treating patients with HIV/AIDS.[14] Another study showed that on average 60% of Nigerian dental students were willing to care for PLWA.[5,9] A widespread poor attitude and disposition among students may continue after completion of their studies.

The goal of any professional education is to produce practitioners with competencies in the technical and non-technical aspects of practice. Technical competence is the ability to perform a specific task in a given situation, while non-technical competence involves the nuances and understanding that enable a practitioner to communicate effectively with patients and other healthcare professionals and select appropriate treatment and procedures.[15] Therefore, a preferred professional programme should prepare students with the necessary cognitive, psychomotor and affective skills, including a positive disposition to provide care and perform procedures on patients with any condition, including transmissible diseases such as AIDS.

It has been shown that a willingness to treat patients with HIV/AIDS may be related to knowledge of the disease process, recognition of its

manifestations, and understanding of its modes of transmission.[16] However, knowledge alone may not be sufficient to guarantee optimal care for patients with stigma-associated conditions such as AIDS. As contributors to healthcare, students' willingness to use specific procedures allows for the identification of areas of concern that can be focused on during training to optimise behaviour in managing PLWA or any other contagious disease.

The literature shows that previous studies indirectly investigated medical and dental students' willingness to care for PLWA using global attitudinal items. None of these studies utilised clinical scenarios to elicit willingness responses.[5,9,11,13-17] Only a few studies assessed willingness towards procedures such as mouth-to-mouth resuscitation.[8,10] Therefore, the aim of our study was to assess medical and dental students' willingness to perform specific common procedures during medical and dental care of PLWA.

Materials and methods

Sample

Participants in this study were medical and dental students in the last two years of their professional training at the College of Medical Sciences, University of Maiduguri, Borno State, Nigeria,who were willing to participate. A total of 304/385 students surveyed returned their questionnaires, translating to a response rate of 78.9%.

Instrument

A two-part 21-item questionnaire designed by Held,[18] and adapted by Balogun *et al.*,[19] was used in this study. Part 1 elicited sociodemographic information on previous experience with PLWA and previous AIDS educational instructions. Part 2 elicited students' willingness to perform five selected techniques or procedures or care unique to their discipline on a 5-point Likert scale, ranging from strongly willing (1) to strongly unwilling (5). All five items on the subscale were worded positively to minimise the inherent contamination and response shift bias due to social desirability phenomena.[20] The minimum and maximum scores for the subscale were 5 and 25, respectively, and the higher the subjects' total score, the less the willingness to provide services for PLWA. Held[18] and Balogun *et al.*[19] reported reliability coefficients of 0.80 and 0.76, respectively, for the willingness subscale of the instrument. In a separate Nigerian study, Oyeyemi *et al.*[21] reported correlation coefficients ranging between 0.72 and 0.88 for the subscales of the instrument, including the willingness subscale.

The willingness subscale for medical students was adapted from a scale used to assess physicians' willingness in a previous study,[7] while the willingness subscale for dental students was developed by the authors in collaboration with experienced dental practitioners in a teaching hospital. The content of the final document was judged to have face validity by two lecturers in the discipline.

Procedure

A sample of convenience comprising medical and dental students in the College of Medical Sciences, University of Maiduguri, participated in this survey. The questionnaire was handed to the students in their lecture halls at the University of Maiduguri Teaching Hospital after lectures on topics unrelated to AIDS.

Prior to the study, ethical approval was obtained from the University of Maiduguri Teaching Hospital Ethical Committee. Anonymity was assured, while participants were also informed in a cover letter that completion and submission of the survey form implied consent.

Data analysis

Using SPSS version 16, descriptive statistics of means and percentages were computed and analysis of variance (ANOVA) and independent *t*-tests were used to determine the influence of sociodemographic variables on willingness. Multiple regression analyses determined the predictors of willingness to perform procedures. Proportional differences were explored using chi statistics. Differences were considered significant at an alpha level of 0.05.

Results

The students' mean age was 24.9 (SD±2.6) years. A total of 188 (61.8%) were male, 116 (38.1%) were female, and 218 (71.7%) did not personally know anyone living with HIV/AIDS. Approximately 154 (51%) had previously been asked to provide care to PLWA, 182 (59.9%) had experience in caring for PLWA, and 300 (98.7%) had received instructions on HIV/AIDS. Furthermore, 270 (88.8%) would care for PLWA if asked to do so. Medical students tended to have been asked to care for PLWA more frequently (chi statistic = 12.15; $p<0.001$) and had more previous encounters with PLWA (chi statistic = 85.25; $p<0.001$) than dental students (Table 1).

Willingness to care for PLWA

The majority of medical students were willing to perform venepuncture ($n=174$; 75.3%) and insert arterial lines ($n=17$; 74.0%), while 143 (61.9%) were not willing to perform mouth-to-mouth resuscitation on PLWA. A total of 126 (55%) medical students were willing to perform vaginal examinations, while 160 (69.2%) would assist with surgery for PLWA. Among dental students, 58 (78.8%) were willing to perform impression casting, while almost half ($n=35$; 48%) were unwilling to assist with an operation. Only about 60% were willing to perform scaling and polishing ($n=43$; 59.6%,), and 25 (34.6%) and 34 (46.2%) were unwilling to perform tooth extractions and root canal therapy, respectively (Table 2).

The students' mean overall willingness score was 13.4±4.0 out of a possible total score of 25. Overall, medical students were either willing or undecided on responses with regard to performing venepuncture (2.2±0.9), inserting arterial lines (2.3±1.0), and performing surgery (2.4±1.1), while they were more undecided than willing to perform vaginal examinations (2.7±1.1). However, these students were mostly unwilling to perform mouth-to-mouth resuscitation on PLWA (3.9±1.1). Overall, dental students were willing to do impression casting (1.9±0.9) and willing or undecided to perform scaling and polishing procedures (2.6±1.2).They were mostly undecided about performing tooth extractions (2.9±1.1) and root canal therapy (3.2±1.2) and in assisting during operations (3.1±1.3).

Medical students' willingness was significantly lower ($p<0.001$) to perform mouth-to-mouth resuscitation compared with other procedures. For dental students, there was no significant difference ($p>0.05$) between willingness to do scaling and polishing and tooth extractions; however, there was a significant difference between these and other procedures. Also, willingness to perform impression casting was significantly better ($p<0.05$) than willingness to carry out other procedures. Furthermore, there was no significant difference ($p>0.05$) with regard to willingness to assist with surgery and perform root canal therapy. There was a significant difference ($p<0.05$) between carrying out these tasks and others such as scaling and polishing, tooth extraction and impression casting (Table 2).

Table 1. Students' demographic characteristics and previous experience or encounters with PLWA (*N*=304)

Independent variable	Medicine *n* (%)	Dentistry *n* (%)	Total *n* (%)	Chi-statistic	*p*-value
Gender					
Male	147 (63.3)	41 (56.2)	188 (61.8)	17.053	<0.001
Female	84 (36.4)	32 (43.8)	116 (38.2)		
Disciplines	231 (54.9)	73 (45.1)	304 (100)		
Clinical year					
Two	128 (55.4)	35 (47.9)	163 (53.6)	1.592	>0.05
Three	103 (44.6)	38 (52.1)	141 (46.4)		
Ever been asked to provide services for PLWA					
Yes	130 (56.3)	24 (32.9)	154 (50.7)	0.053	>0.05
No	101 (43.7)	49 (67.1)	150 (49.3)		
Ever refused to care for PLWA					
Yes	23 (10.0)	6 (8.2)	29 (9.5)	199.06	<0.001
No	208 (90.0)	67 (91.8)	275 (90.5)		
Ever cared for PLWA					
Yes	146 (63.2)	36 (49.3)	182 (59.9)		0.001
No	85 (36.8)	37 (50.7)	122 (40.1)	11.842	
Know of family member or another PLWA					
Yes	168 (72.7)	50 (68.5)	218 (71.7)		<0.001
No	63 (27.3)	23 (31.5)	86 (28.3)	57.316	
Will care for a PLWA if asked					
Yes	209 (90.5)	61 (83.6)	270 (88.8)		<0.001
No	22 (9.5)	12 (16.4)	34 (11.2)	183.211	
Ever received instructions on AIDS					
Yes	230 (99.6)	70 (95.9)	300 (98.7)		<001
No	1 (0.4)	3 (4.1)	4 (1.3)	288.211	
Satisfied with instructions on AIDS					
Yes	141 (61.0)	39 (53.4)	179 (58.9)	96.658	<0.001
No	90 (38.9)	34 (46.5)	121 (39.8*)		

PLWA = people living with AIDS.
*The subtotals do not add up to 304 because this phrase does not apply to those who did not receive any previous instructions on AIDS. On the items 'Satisfied with instructions', those who responded being either somewhat dissatisfied or dissatisfied were merged together as the group that responded 'No'. Those who were satisfied or somewhat satisfied were merged together as the group that responded 'Yes'. Clinical year three denotes the last year of training, while clinical year two denotes the penultimate year of training.

Influence of sociodemographic and previous encounters on willingness to care for PLWA

The effect of sociodemographics on overall willingness score in each discipline was assessed. Among medical students, there was a significant difference in willingness by gender, with males being more willing to care for PLWA ($p<0.05$). There was also a significant difference ($p<0.05$) in willingness by religious affiliation, as students who subscribed to the Christian faith were more willing to care for PLWA than their Muslim counterparts (mean score: Muslims = 13.08; Christians = 14.02). Moreover, students who answered 'No' to the question 'Have you ever refused to care for PLWA?' were more willing to care for PLWA ($p<0.05$) than those who answered 'Yes' (mean = 15.61 v. 13.37).

Among dental students, there was no significant difference by gender and religion ($p>0.05$). However, students who answered 'Yes' to the question 'Have you ever been asked to care for PLWA?' were more willing to care for PLWA ($p<0.05$) than those who answered 'No' (mean = 13.73 v. 11.21). Students who know a family member with AIDS were more willing to care for PLWA ($p<0.05$) than those who did not (11.9 v. 15.2).

Across both disciplines, those with previous experience of caring for AIDS patients were more willing to care for PLWA than their counterparts who had not had any previous contact with such patients ($p<0.001$). When asked, 'Will you be willing to care for PLWA?' students who answered positively were more willing to care for PLWA ($p<0.05$; mean = 13.4 v. 15.3 (medical); $p<0.001$; mean = 12.2 v. 16.8 (dental)) than those who answered negatively. Students who chose hospital practice as their long-term goal were more willing to care for PLWA ($p<0.05$; F=2.75 (medical); F=2.98 (dental)) than those who would prefer teaching. Those who were satisfied with instructions on AIDS were more willing to care for PLWA than those who were somewhat dissatisfied or not satisfied ($p<0.05$; F=3.78 (medical); F=2.91 (dental)). There was no significant difference in willingness by clinical year ($p>0.05$). In the final regression equation, knowing a family member living with AIDS was by far the strongest predictor of willingness ($R^2=0.22$; $p<0.001$), followed in descending order by refusal to care for PLWA ($R^2=0.20$; $p<0.001$) and long-term goal ($R^2=0.18$; $p<0.001$).

Discussion

The majority (88.8%) of medical and dental students in this study were generally willing to care for PLWA if asked to do so. The proportion of dental students who were willing to provide oral health services to PLWA (88.8%) exceeds that of Nigerian dental students in previous studies in which only about 60% expressed willingness.[5,9] The proportion is also higher than or comparable to Nigerian dentists in two previous studies in which 63.6% and 78.4% of respondents, respectively, were willing to provide care to PLWA.[22,23] This proportion can almost be compared with that of dental students in the USA (83%),[24] while it exceeded that in Taiwan (49%),[13] India (75%),[11] Iraq (75.5%)[25] and Jordan (73.7%).[26]

In the present study, the proportion of medical students (90.5%) who were willing to care for PLWA if asked is higher than the 85% reported by Tibdewal *et al.*[11] among Indian medical students. It is higher than that reported among Nigerian doctors (82%), in whom willingness was assessed using the same scale as in the

Table 2. Willingness to care for PLWA in each discipline

Items	Willing *n* (%)	Undecided *n* (%)	Unwilling *n* (%)	Mean (±SD)
Medicine				
Perform vaginal examination	126 (54.5)	49 (21.2)	56 (24.2)	2.7 (1.1)[a]
Perform surgical operation	160 (69.2)	30 (13.0)	41 (17.8)	2.4 (1.1)[a]
Insert arterial lines	171 (74.0)	41 (17.7)	19 (8.2)	2.3 (1.0)[a]
Perform venepuncture	174 (75.3)	39 (16.9)	18 (7.8)	2.2 (0.9)[a]
Perform mouth-to-mouth resuscitation	37 (16.0)	51 (22.1)	143 (61.9)	3.9 (1.1)[b]
Dentistry				
Perform scaling and polishing	43 (59.6)	13 (17.3)	17 (23.1)	2.6 (1.2)[c]
Perform root canal therapy	21 (28.8)	18 (25)	34 (46.2)	3.2 (1.2)[b]
Perform impression casting	58 (78.8)	8 (11.5)	7 (8.6)	1.9 (0.9)[a]
Carry out tooth extraction	30 (40.4)	18 (25)	25 (34.6)	2.9 (1.1)[c]
Assist with surgical operation	28 (38.5)	10 (13.5)	35 (48.0)	3.1 (1.3)[b]

PLWA = people living with AIDS.
'Willing' denotes respondents who were either willing or strongly willing to perform a procedure or technique or provide care. 'Unwilling' denotes respondents who were either unwilling or strongly unwilling to perform a procedure or technique or provide care. The lower the mean score, the better the willingness. Means with different superscripts are significantly different ($p<0.05$) from each other, while those with the same superscript are not.

present study.[7] Only 16.0% of medical students were willing to perform mouth-to-mouth resuscitation on PLWA compared with 24%[10] and 72%[8] reported among medical students in India and the USA, respectively.

The proportion of medical students willing to assist with surgery is comparable to the 60% reported by Mohsin *et al.*,[10] but slightly lower than the 71% reported by Kermode *et al.*[2] in a study among healthcare workers in rural India. Overall, medical students were more willing to perform non-invasive procedures, such as venepuncture, and insert arterial lines, than performing vaginal examinations, which is considered to be an invasive procedure.

Dental students were also more willing to carry out less invasive procedures such as impression casting and scaling and polishing than root canal therapy and tooth extractions, which are considered to be invasive. This finding is consistent with that of Mohsin *et al.*,[10] who reported an unwillingness among medical students to carry out invasive procedures involving AIDS patients.

Medical students were more willing to assist with surgery than dental students (69.2% v. 38.5%), probably because more of the former had previous experience of caring for PLWA (63.2% v. 49.3%). The influence of religious affiliation on willingness to perform procedures is in agreement with the findings in one previous study that reported a more positive attitude among Catholics than Jewish students.[19] Previous experience of working with AIDS patients was also associated with an increased willingness to care for PLWA, a finding consistent with a recent report among Nigerians doctors,[7] but at variance with one previous study on allied health professional students.[8]

Limitations of this study

This single-centre study has limitations in terms of the generalisability of the findings. Its results should be interpreted with caution because the students' responses could have been affected by social desirability phenomena,[18] in which the students answered questions based on what they presumed is socially desirable. Furthermore, the apparent disparity between students' responses is evidenced by the overwhelming majority of them indicating that they would care for PLWA if asked and their overall disposition that rates were undecided in 3 of the 5 procedures. This highlights the difficulty in predicting behaviour, and therefore the findings of this study should be interpreted cautiously.

Conclusion

The cohorts of medical and dental students in the present study were willing to care for PLWA if asked, but may be reluctant with regard to performing some common procedures on PLWA. These students were more willing to carry out less invasive procedures than those which they considered to be invasive ones. Previous personal encounters with PLWA, satisfaction with instructions and answering 'Yes' to the question 'Are you willing to care for PLWA?' influence students' willingness to perform procedures on PLWA. Preferred practice settings, previous refusal to care for PLWA when asked, and knowing a family member or some other PLWA combined, predict willingness. This study suggests that extensive use of clinical clerkships and exposure through direct experience can enhance students' disposition to perform procedures on PLWA.

References

1. Marchal B, De Brouwere V, Kegels G. Viewpoint: HIV/AIDS and the health workforce crisis: What are the next steps? Trop Med Int Health 2005;10(4):300-304.
2. Kermode M, Jolley D, Langkham B, Thomas MS, Croft N. Occupational exposure to blood and risk of bloodborne infection among healthcare workers in rural north Indian healthcare settings. Am J Infect Control 2005;33(1):34-41.
3. Islam MT, Mostafa G, Bhuiya AU, Hawkes S, de Francisco A. Knowledge on, and attitude toward HIV/AIDS among staff of international organization in Bangladesh. J Health Popul Nutr 2002;20:271-278.
4. Al-Mazrou YY, Abouzeid MS, Al-Jeffri MH. Knowledge and attitudes of paramedical students in Saudi Arabia toward HIV/AIDS. Saudi Med J 2005;26:1183-1189.
5. Oboro H, Azodo C, Sede M. Perception of HIV/AIDS patients among pre-clinical dental students. Int J Infect Dis 2008;12(Suppl 1):e158.
6. McCarthy GM, Koval JJ, MacDonald JK. Factors associated with the refusal to treat HIV-infected patients: The results of a national survey of dentists in Canada. Am J Public Health 1999;89(4):541-545.
7. Adetoyeje Y, Oyeyemi BO, Bello IS. Physicians and AIDS care: Does knowledge influence their attitude and comfort in rendering care? Afr J Health Sci 2007;14:37-43. [http://dx.doi.org/10.4314/ajhs.v14i1.30844]
8. Kopacz DR, Grossman LS, Klamen DL. Medical students and AIDS: Knowledge, attitudes and implications for education. Health Educ Res 1999;14(1):1-6.
9. Azodo CC, Ehigiator O, Oboro HO, et al. Nigerian dental students' willingness to treat HIV-positive patients. J Dent Educ 2010;74:446-452.
10. Mohsin S, Nayak S, Mandaviya V. Medical students' knowledge and attitude related to HIV/AIDS. Nat J Comm Med 2010;1(2):146-149.
11. Tibdewal H, Barad P, Kumar S. Comparing dental and medical students' knowledge and attitudes toward hepatitis B, C and HIV infected patients in India – a cross-sectional study. J Int Oral Health 2009;1:20-32.
12. Ahmed SI, Hassali MA, Abdul NA. An assessment of the knowledge, attitudes, and risk perceptions of pharmacy students regarding HIV/AIDS. Am J Pharm Edu 2009;73(1):15.
13. Hu SW, Lai HR, Liao PH. Comparing dental students' knowledge of and attitudes toward hepatitis B virus-, hepatitis C virus-, and HIV-infected patients in Taiwan. AIDS Patient Care STDS 2004;18(10):587-593.
14. Nasir EF, Astrøm AN, David J, Ali RW. HIV and AIDS related knowledge, sources of information, and reported need for further education among dental students in Sudan – a cross sectional study. BMC Public Health 2008;8:286. [http://dx.doi.org/10.1186/1471-2458-8-286]
15. Harden RM. International medical education and future directions: A global perspective. Acad Med 2006;81(12):S22-29.
16. Erasmus S, Luiters S, Brijlal P. Oral hygiene and dental students' knowledge, attitude and behaviour in managing HIV/AIDS patients. Int J Dent Hyg 2005;3(4):213-217.
17. Cohen LA, Romberg E, Grace EG, Barnes DM. Attitudes of advanced dental education students toward individuals with AIDS. J Dent Educ 2005;69(8):896-900.
18. Held SL. The effects of an AIDS education program on the knowledge and attitudes of a physical therapy class. Phys Ther 1993;73(3):156-164.
19. Balogun JA, Kaplan MT, Hoeberlein-Miller T, Anthony A, Lefkowitz R, Hsia L. Knowledge, attitudes, and willingness of junior healthcare professional students to provide services for patients with acquired immunodeficiency syndrome. J Phys Ther Edu 1998;12(1):57-63.
20. Anastasi A. Psychological Testing. 5th ed. New York, NY: Macmillan Publishing, 1982.
21. Oyeyemi Y, Oyeyemi L, Akinwale G, Aderibigbe I, Alaba O, Anjorin O. Knowledge and affective traits of physiotherapy students to provide care for patients living with AIDS. S Afr J Physiother 2010;66(3):1-6.
22. Uti OG, Agbelusi GA, Jeboda SO. Are Nigerian dentists willing to treat patients with HIV infection? Nigerian Dent J 2007;15(2):66-70.
23. Utomi IL, Onajole AT, Arotiba JT. HIV/AIDS: Knowledge and attitudes of dentists in South Western Nigeria. Nigerian J Health Biomed Sci 2008;7(1):36-41.
24. Seacat JP, Inglehart MR. Education about treating patients with HIV infections/AIDS: The student perspective. J Dent Educ 2003;67(6):630-640.
25. Al-Naimi RJ, Al-Saygh GD. Knowledge, attitude and health behavior of dental students towards HIV patients. Al-Rafidain Dent J 2009;9(1):110-119.
26. Ryalat ST, Sawair FA, Shayyab MH, Amin WM. The knowledge and attitude about HIV/AIDS among Jordanian dental students: Clinical versus pre clinical students at the University of Jordan. BMC Research Notes 2011;4:191. [http://dx.doi.org/10.1186/1756-0500-4-191]