

Knowledge and Awareness about HIV/AIDS among Diyala University Students between 2010 and 2015

Abdul-Razak SH. Hasan (Ph.D)¹

Asmaa H.Hwaid (M.Sc)^{*2}

Rafal M.Khalifa (B.Sc)²

Ashwak T. Humadi (B.Sc)²

¹Department of Microbiology, College of Medicine,
Diyala University, Diyala, Iraq.

²Department of Biology, College of Education for Pure
Science, Diyala University, Iraq.

Abstract

Background: Human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) are the major global health problem at the last fourth decades, knowledge and awareness can play an important role to decrease morbidity and mortality. **Objectives:** This study was conducted to evaluate the knowledge and awareness about HIV/AIDS among students between years 2010 and 2015. **Subjects and methods:** The present study was based on questionnaire survey conducted in Diyala University- Iraq, during the

period 2010 and 2015. The study included 334 students, 205 were females with mean age (22.38±4.99) years, and the age range was (19-30) years, and 129 were males with mean age (22.38±4.99) years, and the age range was (19-30) years. The enrolled students were belong to different colleges and were from third and fourth classes. Data was collected using questionnaire that was constructed and adopted from previous studies. **Results:** Generally, the results showed that the participants had fair knowledge and satisfactory awareness about the causative agent of AIDS

and its transmission through blood transfusion and sexual contact. However, there is inadequate knowledge and awareness about vertical transmission of HIV from mother to child, through breast feeding, drug abuse and available of vaccine.. The levels of knowledge and awareness among students were significantly higher in 2010 compared 2015 ($P < 0.01$). Furthermore, females had significantly higher levels of knowledge and awareness than males ($P < 0.05$), ($P < 0.01$) respectively.

Conclusion: In general, the knowledge and awareness of university students are fair; however, strengthening and motivation of educational programs are recommended for this stratum of the community.

Keywords: HIV/ AIDS, knowledge and awareness, college students

Introduction

Human immunodeficiency virus (HIV) is the etiologic agent of acquired immune deficiency syndrome (AIDS). It was first described as a new disease in the United State in 1981. AIDS represents the final stage manifestation of HIV infection and the earlier stages of the infection are asymptomatic [1]. Transmission of HIV occurs in multiple ways; most efficiently through infected blood and blood derivatives, by sexual contact, and vertically through transmission of the

virus from infected mother to her baby either across the placenta (in utero), during birth process or via breast feeding [2,3]. In addition to varied transmission routes, different clinical features and its complications at the long term besides lack of vaccine, HIV/AIDS became one of the most important global health problems worldwide [4]. UNAIDS released its report, to end AIDS by 2030: was to address the needs of the total estimated HIV-infected population of 36.9 million people, with about 1.2 million AIDS-related deaths having occurred in 2014 [5].

In the Middle East and North Africa (MENA) region, the HIV epidemic has been on the rise since 2001. Although the overall HIV prevalence in the region is still low, the increase in new infections has put MENA among the top two regions in the world with the fastest growing HIV epidemic, nearly 500 000 people are living with HIV in the MENA region mainly in Pakistan and Sudan [6,7,8,9,10]. At the end of 2003; the number of HIV patients among Saudi and non-Saudi residents was 1,743 and 6,064 [11]. In Yemen, the number of people who living with HIV/AIDS has increase between 2002 and 2008 from 1122 to reach 2075 [12]. In Iraq, at the end of 2000, the number of HIV cases was very low; the total number of HIV/AIDS

cases was 124 at the end of 2001 [13]. Furthermore the cumulative number of HIV/AIDS cases was 247 from years 1986-2005, and the most common mode of transmission (84%) was via imported blood products, 11.3% by sexual route and 5% from the mother to her child, No reported cases transmitted via drugs addicts or homosexual [14]. The Islamic religion and other heavenly religions as well as traditions and social norms play an important role in the low prevalence of HIV/AIDS in Iraq.

In the absence of a vaccine and a cure for HIV, health education programs played an important role in preventing the spread and control the disease. University students and younger generation play an important role by increasing the awareness and knowledge about the modes of transmission and factors affecting the increase of infection rates [10,15]. Therefore, this study was conducted to assessment the knowledge and awareness among Diyala university students.

Subjects and method:

Participants

This study included (334) student college who were in third stage and fourth stage who were included in graduating projects at the time of the study, those students

were from Diyala university (college of science, department of biology, College of Veterinary, College of Education for Pure Science department of biology, College of Education for Humanities, department of Arabic and history, Technical Institute, department of health and community and College of Physical Education and Sports Science. The participants of students was 205 females, the mean age was (22.38±4.99) years, the age range was (19-30) years and 129 males (22.38±4.99) years, the age range was (19-30) years.

Measures

Assessment of the knowledge and awareness of HIV/AIDS was measured by using self-administered questionnaire (Appendix 1). A self-questionnaire was adaptive from previous studies used survey questionnaire to evaluate the knowledge and awareness of HIV/AIDS [16,17,18]. The questionnaire was include two parts to collect required data on the following: (1) demographic information related to age, gender and (2): twelve questions that deal with the knowledge and awareness of HIV, mode of transmission, vaccine and treated and risk factors, these questions evaluating knowledge were "yes/ no/ don't know" patterns. The questionnaire was written in Arabic and English language

when it presented to the college students .

Procedure

The present study is a cross sectional study was conducted in Baqubah city, Diyala province, Iraq between years 2010 and 2015. Interview between the researcher and the students was performed and the participants gave prior approval before the interview start, after the interview, the participants received details counseling about HIV/AIDS. Diyala university and its colleges approved the study

Data Analysis

Statistical analysis was performed using SAS version - 9.1th Ed. (Inst. Inc, Cary, NC, USA) Chi-square test was used to compare between different variables according to the correct answer to the question only and P - value of < 0.05 was considered significance.

Results

A total of 334 participants were enrolled, 166 were included in the study of 2010 and 168 were included in the study of 2015. The quantitative baseline data of the participants was shown in table (1).

Table (1): Baseline data of participants.

Variable	No / 2010	No / 2015	Mean age±SD
Male	64	65	(22.58±1.53)
Female	102	103	(22.38±4.99)
Total	166	168	

A comparison of results of the MCQ answers according to the year was showed in table (2). In the question 1 and 2, it seems that the majority of students knew that HIV/AIDS is a viral disease, and can be transmitted through illegal sex. Thus no significant difference was found between years. Whether, HIV transmitted through blood and blood products, Students of 2010 were significantly higher in their answer "Yes" compared to students of year 2015 (92.2% vs 70.6%, P= < 0.01). Likewise, the answer of question 4 was significantly higher in student

2010 versus 2015 (79.0% vs 59.8%, P < 0.01). In answer question 5, about one third of students in both eras were known that HIV can be transmitted vertically through breast feeding, with insignificant difference (p > 0.05).

Students in year 2010, again had significantly higher correct answer for question 7 compared to students 2015 (88.6 % vs 73.6%, P = <0.01). On the other hand, about two third of students in both eras knew that HIV can be transmitted through tooth brush and razors with insignificant

difference (P > 0.05). Furthermore, students in 2010 had significantly higher knowledge about the non-

availability of vaccine for HIV compared to students 2015 (62.2 % vs 34.7%, P< 0.01).

Table(2):Knowledge of HIV/AIDS among participants according to year.

Questions			
Q1	IsAIDS(HIV) a viral disease?		
Years	Yes (No%)	No (No%)	I don't know (No%)
2010	150 (89.82)	9 (5.38)	8 (4.79)
2015	145 (86.82)	11 (6.58)	11 (6.58)
Total	295 (88.32)	20 (5.98)	19 (5.68)
Chi-square	0.936 P>0.05 [NS]		
Q2	Is AIDS(HIV) is transmitted throughsexual contact?		
2010	155 (92.81)	8 (4.79)	4 (2.39)
2015	154 (92.21)	6 (3.59)	7 (4.19)
Total	309 (92.51))	14 (4.19)	11 (3.29)
Chi-square	0.418 P>0.05 [NS]		
Q3	Is AIDS(HIV) transmitted by blood transfusion,blood productssuch asplasma?		
2010	154 (92.21)	4 (2.39)	9 (5.38)
2015	118 (70.65)	17 (10.17)	32 (19.16)
Total	272 (81.43)	21 (6.28)	41 (12.27)
Chi-square	7.82 P<0.01 [S]		
Q4	IsAIDS(HIV)transmittedduring pregnancyfrom mother tofetus inside theuterus?		
2010	132 (79.04)	14 (8.38)	21 (12.57)
2015	100 (59.88)	17 (10.17)	50 (29.94)
Total	232 (69.46)	31 (9.28)	71 (21.25)
Chi-square	7.24 P<0.01 [S]		
Q5	IsAIDS(HIV) transmittedfrom mother to childthroughbreast-feeding?		
2010	64 (38.32)	63 (37.72)	40 (23.95)
2015	66 (39.52)	26 (15.56)	72 (43.11)
Total	130 (38.92)	89 (26.64)	112 (33.53)
Chi-square	0.392P > 0.05 [NS]		
Q6	IsAIDS(HIV) transmittedfrom mother to childduringbirth?		
2010	92 (55.08)	26 (15.56)	49 (29.34)
2015	63 (37.72)	34 (20.35)	70 (41.91)
Total	155 (46.40)	60 (17.96)	119 (35.62)
Chi-square	7.95 P < 0.01 [S]		
Q7	IsAIDS(HIV) transmittedthroughshared use		

of needles(injection)?			
2010	148 (88.62)	11 (6.48)	8 (4.79)
2015	123 (73.65)	21 (12.57)	23 (13.77)
Total	271 (81.13)	32 (9.58)	31 (9.28)
Chi-square	6.35 P < 0.01 [S]		
Is AIDS(HIV) transmitted through the common use of toothbrush and razors?			
2010	115 (68.86)	34 (20.35)	18 (10.77)
2015	103 (61.67)	37 (22.15)	27 (16.16)
Total	218 (35.32)	71 (21.25)	45 (13.47)
Chi-square	3.216 P > 0.05 [NS]		
Is drug abuse increases HIV infection rates?			
2010	110 (65.86)	22 (13.17)	35 (20.95)
2015	75 (44.91)	39 (23.35)	53 (31.73)
Total	185 (55.38)	61 (18.26)	88 (26.34)
Chi-square	7.84 P < 0.01 [S]		
Is the vaccine for the prevention of the disease available?			
2010	104 (62.27)	31 (18.56)	32 (19.16)
2015	58 (34.73)	65 (38.92)	44 (34.73)
Total	162 (48.50)	96 (28.74)	76 (22.75)
Chi-square	8.923 P < 0.01 [S]		

A comparison of results of the MCQ answers according to the gender was showed in table (3). Regarding question 1 and 2, the majority of males and females has previous knowledge that HIV is a viral disease, and can be transmitted through illegal sex. However, Females had significantly higher correct answer for question 3 (87.80% vs 71.31%, P < 0.01). Similarly, females had significantly higher correct answer concerning question 3 and 4.

Question 5 and 6 about the routes of HIV transmission, the answers showed insignificant differences between both sexes. However, Females had significantly higher correct answer regarding questions 7, 8, and 9. Whereas, males had significantly higher correct answer regarding the availability of HIV vaccine compared to female (54.2% vs 44.8%, P < 0.05).

Table (3): Knowledge of HIV/AIDS among participants according to gender.

Questions			
Q1	Is AIDS(HIV) a viral disease?		
Gender	Yes (No%)	No (No%)	I don't know (No)%
Male	109 (84.49)	12 (9.30)	8 (6.20)
Female	186 (90.73)	8 (3.90)	11 (5.36)
Chi-square	1.79 P > 0.05 [NS]		
Q2	Is AIDS(HIV) is transmitted through sexual contact?		
Male	120 (93.03)	4 (3.10)	5 (3.87)
Female	189 (92.19)	10 (4.87)	6 (2.92)
Chi-square	0.274 P>0.05 [NS]		
Q3	Is AIDS(HIV) transmitted by blood transfusion or blood products such as plasma?		
Male	92 (71.31)	16 (12.40)	21 (16.27)
Female	180 (87.80)	5 (2.43)	20 (9.75)
Chi-square	6.73 P < 0.01 [S]		
Q4	Is AIDS(HIV) transmitted during pregnancy from mother to fetus inside the uterus?		
Male	83 (64.34)	17 (13.17)	29 (22.48)
Female	149 (73.68)	14 (6.82)	42 (20.48)
Chi-square	4.64 P < 0.05 [S]		
Q5	Is AIDS(HIV) transmitted from mother to child through breast-feeding?		
Male	48 (37.20)	46 (35.65)	35 (27.13)
Female	82 (40.0)	46 (22.43)	77 (37.56)
Chi-square	1.03 P>0.05 [NS]		
Q6	Is AIDS(HIV) transmitted from mother to child during birth?		
Male	58 (44.96)	28 (21.70)	43 (33.33)
Female	97 (47.31)	32 (15.60)	76 (37.07)
Chi-square	0.472 P> 0.05 [NS]		
Q7	Is AIDS(HIV) transmitted through sharing of needles (injection)?		
Male	92 (71.31)	20 (15.50)	17 (13.17)
Female	179 (87.31)	12 (5.85)	14 (6.82)
Chi-square	6.83 P<0.01 [S]		
Q8	Is AIDS(HIV) transmitted through the sharing of toothbrush and razors?		
Male	75 (58.13)	38 (29.45)	16 (12.40)
Female	143 (69.75)	33 (16.09)	29 (14.14)
Chi-square	5.09 P< 0.05 [S]		

Q9	Is drug abuse increases HIV infection rates?		
Male	57 (44.18)	33 (25.58)	39 (30.23)
Female	128(62.43)	28 (13.65)	49 (23.90)
Chi-square	6.93 P < 0.01 [S]		
Q10	Is the vaccine for the prevention of the disease available?		
Male	70 (54.26)	35 (27.13)	24 (18.60)
Female	92(44.87)	61 (29.75)	52 (25.36)
Chi-square	4.63 P<0.05 [S]		

Discussion

The present MCQ questionnaire survey evaluates the knowledge and attitude of University students as these groups of society can play an influential role in preventing spread of HIV/AIDS among population. Furthermore, although the HIV/AIDS is a worldwide epidemic, however, this viral infection can be avoidable by simple knowledge and awareness of general public about the HIV and its ways of transmission.

The results showed, in accordance with Original Bloom's Cut Off Points [19,20] (Appendix 2), that the participants university students, generally, have good levels of knowledge and awareness about the etiology of HIV/AIDS, sexual contact, blood transfusion and sharing of needles as a route of transmission of HIV. Nevertheless, there was inadequate or lack of knowledge and awareness about transmission of HIV through breast feeding, during

birth, drug abuse and available of vaccine.

The results showed that 88.32% of university students knew that HIV/AIDS is a viral disease with no statistically significant difference of students' knowledge levels between years 2010 and 2015. These results are inconsistent with Zaini and Anium, [21], who found that 70% of the Taif University students, Saudi Arabia, didn't know that HIV is the etiologic agent of AIDS. Similarly, in Oman, AL-Jabri and AL-Abri, [22], reported a poor knowledge levels among medical undergraduate students. However, our study is in agreement with Khalid et al., [10], who reported high knowledge levels 91.7%.

The present results reported that 92.51% of university students, knew that sexual contact as a route of transmission of HIV with no statistically significant difference between years 2010 and 2015 and 81.43% of the participants knew that HIV can transmitted through blood transfusion or blood products, with statistically significant

difference of students' knowledge levels between years 2010 and 2015. On the other hand, 81.13% of university students correctly answered that HIV/AIDS can be transmitted by sharing needles, with statistically significant difference of students' knowledge levels between years 2010 and 2015. Regarding tooth brush, only 65.26% knew that it can transmit HIV with no statistically significant difference between years 2010 and 2015. Khan et al., [8] in a study conducted in two colleges in Peshawar, found that only 28% correctly answered that HIV/AIDS can be transmitted by contaminated blood transfusion and only 10% knew that HIV/AIDS can be transmitted by unsterilized syringes. Both of pharmacy students in Qatar University and the University of Saskatchewan in Canada have a high knowledge and awareness levels about the route of transmission of HIV through sexual contact (100% for both), blood transfusion (92.0% vs 95.9%) [23]. In Sana'a City, Yemen, (87.5%) and (71.8%) of university students knew that HIV can be transmitted by syringe and blood transfusion [24]. In accordance with the present results, AL-Mazrou et al., (2005) [16] reported a lack of knowledge and awareness about transmission of HIV through tooth brush.

A total of 64.46% of participants knew that HIV/AIDS can be transmitted from mother to her fetus with statistically significant difference of students' knowledge levels between years 2010 and 2015, this study reported a lack of knowledge about transmission of HIV/AIDS through breast feeding and from mother to child during birth, only 38.92%, 46.40% correctly answered, respectively, with statistically significant difference between years 2010 and 2015. In contrast with present results, AL-Mazrou et al., [16] showed a higher level of knowledge and awareness, 82.4% of participants answered correctly that HIV can be transmitted during pregnancy. Another study reported a high level (96%) of knowledge and awareness about transmission of HIV/AIDS during pregnancy [25]. The present result was consistent with those reported by others who found that poor levels of knowledge about breast feeding as a route of transmission [26,27,16]. In consistent with the present results, Jindal, [28] reported high levels of knowledge about risk of developing AIDS in children born to the infected mothers.

This study showed inadequate knowledge about

drug abuse and related with increase the rate of HIV infection; only (55.38%) knew that drug use can increase HIV infection rates, with statistically significant difference of students' knowledge levels between years 2010 and 2015. Farid and Choudhry, [26] reported a lack of knowledge levels, only 38.8% knew that drug addicts can increase HIV infection rates. The present results study consistent with another study conducted in Ludhian Punjab, India, sharma et al., [29] documented a lack knowledge levels, only (58%) of student knew that HIV can transmitted through intravenous drug abuse. Only (48%) of participants students college answered correctly that provide vaccine for AIDS with statistically significant difference of students' knowledge levels between years 2010 and 2015. Lack of awareness programs by health institutions and there is no desire to know more about these topics and the excess tendency of youth's towards the sites of social networking, in addition to the restriction of AIDS and it reminds with in stable boundaries especially in developing country, this matter led to decrease their knowledgeable and educational levels, and therefore less knowledge of the levels observed in 2015 compared to 2010

Regarding to the gender, the present results study showed high levels of Knowledge about the etiology of AIDS among females and males 90.73%, 84.49% respectively, with nostatistically significant difference. Khalid et al., [10] documented a high levels of Knowledge was among both sexes. Knowledge and awareness of both genders about the sexual transmission of AIDS was high, with no statistically significant difference, these results was consistent with Li et al., [25] who found a high Knowledge and awareness with no statistically significant difference among male and female. In the present study, the knowledge and awareness about another routs of transmission of HIV by blood transfusion, from mother to the fetus, sharing use of needle and tooth brush and razors among females was high with statistically significant difference in comparison with the knowledge levels among males, these findings are consistent with the results of [30,31] who found that females had more knowledge than males, while, AL-Mazroue et al., [16] documented the opposite of that.

Poor levels of knowledge and awareness and reported among females and males with no statistically significant difference about transmitted of HIV through

breast feeding and from mother to child during birth, these results are consistent with AL-Marzoue et al., [16] results. Females demonstrated moderate knowledge levels about drug abuse and related with increase of HIV infection rates in a comparison with poor level of knowledge among males with statistically significant difference. Tung et al., [30] reported that females possess more knowledge in this point than males. The present results showed poor levels of knowledge and awareness about available of vaccine among male and female with slightly higher rates of awareness among males than girls.

Conclusion

In general, the knowledge and awareness of university students are fair; however, strengthening and motivation of educational programs are recommended for this stratum of the community.

Acknowledgements

The authors would like to thank all colleges of Diyala University in Diyala province for their support.

Conflict of Interest

The authors declare that they have no competing interests.

References

1. Brooks, G. F.; Carrol, K. C.; Butel, J. S. and Mores, S. A. AIDS and Lentrivirus. In: Medical Microbiology. Brooks, G. F.; Carrol, K. C.;

- Butel, J. S. and Mores, S. A. (eds). 24th Ed. The McGraw-Hill Companies, Inc. 2007; P: 604-18.
2. Levinson, W. Human Immunodeficiency Virus. In: Review of Medical Microbiology and Immunology. Levinson, W (eds). 10th Ed. The McGraw - Hill Companies, Inc. 2008; p: 322-30.
3. Asjö, B. Human Immunodeficiency Virus (HIV). In: A particle guide to clinical virology. Haahem, L. R.; pation, J. R. and whitley, R. J. ed. 2nd Ed. John wiley and sons, Ltd. 2002. p:213-18.
4. De Lay, P.R.;Ernberg, G.;Stanecki, K. HIV/AIDS Prevention and Care on Resource-Constrained Settings. A hand Book for the Design and Management of Programs. Lamptey, P.R.;Gayle, H.D.; editors. USA: Family Health International;2001. P:7.
5. Editorial. The death of AIDS- expected or exaggerated? *Lancet Glob. Health.* 2015; 386:2228.
6. UNAIDS. Middle East and North Africa Report on AIDS. 2011. http://www.unaids.org/sites/default/files/media_asset/JC2257_UNAIDS-MENA-report-2011_en_1.pdf. ISBN 978-92-9173-911-0.
7. UNAIDS, HIV & AIDS Estimates 2009. Available at URL:

- <http://www.unaids.org/en/regionscountries/countries/pakistan/>.
8. Khan, S.; Fatima, S.; Afridi, N.K.; Salhotra, V.S.; Jha, K.K. Awareness regarding HIV/AIDS among college students in Khyber Pakhtunkhwa. **SAARC Journal of Tuberculosis, Lung Diseases & HIV/AIDS**. 2011; VIII(2). P: 37-41.
 9. Global Report (2012) UNAIDS report on the global aids epidemic.
 10. Khalid, F. A. Mohammed, A. A. and Farah, E. A. Knowledge and Awareness of AIDS among University of Kassala Students, Sudan. J. Community. Med. Health. Educ. 2013; 3(2). P: 1-3. <http://dx.doi.org/10.4172/2161-0711.1000201>
 11. Madant, T.; AL-Mazroue, Y.; AL-Jeffri, M. and AL-Huzaim, N. Epidemiology of the human immunodeficiency virus in Saudi Arabia: 18-year surveillance results and prevention from an Islamic perspective. BMC. Infect. Dis. 2004; 4: 25-32, 2004.
 12. Badahdah, A. M.; Sayem, N. HIV-related knowledge and AIDS stigma among college students in Yemen. East. Mediterr. Health. J. 2010; 16: 901-6.
 13. World Health Organization. Global HIV/AIDS Response – Epidemic update and health sector progress towards universal access – Progress Report Summary 2004. http://www.who.int/hiv/pub/progress_report2004/en/.
 14. Al-Ibadi, A. K. and Jaleel, U. A. Epidemiological aspects of HIV/AIDS in Iraq. 2007; QMJ. 1(3):80-90.
 15. Islam, M.T.; Mostafa, G.; Bhuiy, A.; Hawkes, S. and Francisco, A. Knowledge on, and attitude toward HIV/AIDS among staff of international organization in Bangladesh. J. Health. Popul. Nutr. 2002; 20: 271-278.
 16. Al-Mazrou, Y. Y.; Abouzeid, M. S. and Al-Jeffri, M. H. Knowledge and attitudes of paramedical students in Saudi Arabia toward HIV/AIDS. Saudi Med J. 2005; 26 (8):1183-89.
 17. Hussain, S. A. Knowledge, Attitude and Beliefs of College Students in Baghdad and Mousel / Iraq about AIDS. Medical Journal of Babylon. 2009; 6:(3-4): 501-6.
 18. Tahir, S. S.; Kadir, M. A.; Akbar, H. S. and Amin, A. M. Knowledge of Secondary School Students on HIV/AIDS in Kirkuk Province / Iraq. J. Fac. Med. Baghdad. 2009; 51(2): 174-77.
 19. Johon, J. The knowledge and attitudes, practice and

- perceived barriers towards screening for premalignant cervical lesions among women aged 18 years and above, In Songea Urban, Ruvuma. Thesis. Muhimbili University of Health and Ahied Science. 2011.
20. Aggarwal, A.; Panat, S. R. Knowledge, attitudes and behavior in managing patients with HIV/AIDS among a group of Indian dental students. *Journal of dental Education*. 2013; 77(9): 1209-17.
 21. Zaini, R. G. and Anjum, F. Awareness of HIV/AIDS among female students attending college of applied medical science at Taif University. *Int. Lab. Med. Res.* 2015; 2: 1-5.
 22. AL-Jabri, A. A. and AL-Abri. Knowledge and attitudes of undergraduate medical and non-medical students in Sultan Qaboos University towards acquired immune deficiency syndrome. *Saudi. Med. J.* 2003; 24: 273-77.
 23. Black, E.; Wilby, K. and Perepelkin, J. A survey of HIV knowledge and attitudes of Pharmacy students in Canada and Qatar. *Saudi Journal for Health Science*. 2015; 2(3): 146-50.
 24. AL-Rabeei, N. A.; Dallak, A. M. and AL-Awadi, F. G. Knowledge, attitudes and beliefs towards HIV/AIDS among of health institutes in Sana'a city. *East. Meditt. Health. J.* 2012; 8(3): 221-26.
 25. Li, X.; Lin, G.; Gao, Z.; Staton, B.; Fang, X.; Yin, Q. and Wu, Y. HIV/AIDS Knowledge and implication for health promotion programs among Chinese college students: geographic, gender, and age differences. *Health promotion International*. 2004; 19(3): 345-56.
 26. Farid, R. and Choudhy, A. J. Knowledge about HIV/AIDS among female college students. *Coll. Physicians. Surg. Pak.* 2003; 13(3): 135-7.
 27. Grover, N.; Prakash, A.; Singh, S.; Singh, N.; Singh, P. and Nazeer, J. Attitudes and Knowledge of dental students of Capital Region regarding HIV and AIDS. *J. Oral. Maxillofac. Pathol.* 2014; 18(1): 9-13.
 28. Jindal, S. Awareness about HIV/AIDS in selected pre University College in Moundbird: A cross-sectional study. *AsiaN. J. Pharm. Clin. Res.* 2013; 1.suppl 1: 208-10.
 29. Sharma, S. K.; Kaur, K. and Kaur, M. Awareness about HIV/AIDS among newly admitted nursing students. *Nursing and Midwifery Research Journal*. 2006; 2(1): 32-38.
 30. Tung, W-C.; Cook, D. M.; Lu, M. and Ding, K. A

comparison of HIV knowledge, attitudes and sources of STI information between female and male college students in Taiwan. Health Care for Women International. 2015; 30(8): 870-82.

Appendix (1): Socio-demographic characteristics
Number of questionnaire

Age	
Gender	
Education	

Appendix (1): Questions related to the knowledge and awareness

Is AIDS (HIV) a viral disease? Yes ----- No ----- ---- Don't Know -----
Is AIDS (HIV) is transmitted through sexual contact? Yes ----- No ----- ---- Don't Know -----
Is AIDS (HIV) transmitted by blood transfusion or blood products such as plasma? Yes ----- No ----- ---- Don't Know -----
Is AIDS (HIV) transmitted during pregnancy from mother to fetus inside the uterus? Yes ----- No ----- ---- Don't Know -----

Is AIDS (HIV) transmitted from mother to child through breast-feeding? Yes ----- No ----- ---- Don't Know -----
Is AIDS (HIV) transmitted from mother to child during birth? Yes ----- No ----- ---- Don't Know -----
Is AIDS (HIV) transmitted through shared use of needles (injection)? Yes ----- No ----- ---- Don't Know -----
Is AIDS (HIV) transmitted through the common use of toothbrush and razors? Yes ----- No ----- ---- Don't Know -----
Is drug abuse increasing HIV infection rates? Yes ----- No ----- ---- Don't Know -----
Is the vaccine for the prevention of the disease available? Yes ----- No ----- ---- Don't Know -----

Appendix 2

Original Bloom's Cut Off Points [16]
 Good Knowledge (80-100%)
 Moderate Knowledge (60-79%)
 Poor Knowledge <60%