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Knowledge about HIV/AIDS and Attitudes toward People Living with HIV/AIDS among Students at a Jordanian Medical School

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Jordan has a low prevalence of the Human Immunodeficiency Virus (HIV)/ Acquired Immunodeficiency Syndrome (AIDS). However, HIV/AIDS is an important global public health issue and medical students in Jordan need to be well-informed about it. To assess Mutah Medical School students' knowledge about HIV/AIDS and to explore their attitudes toward people living with HIV (PLWH). A cross-sectional study conducted in 2013 among clinical years students using a self-administered questionnaire. A total of 209 students filled the questionnaire. Slightly more than half of the students reported having received adequate or more than adequate teaching on sterilization procedures (53%) and barriers (55%), while only 43% reported similar teaching received of cross-infection precautions. The students showed a good overall knowledge about HIV/AIDS and the transmission routes of HIV. However, some misconceptions existed such as thinking that HIV could be transmitted by mosquitos (30%) and flies (10%). Negative attitudes were displayed toward patients with HIV/AIDS with 89% agreeing that AIDS makes their job a high-risk occupation and 60% agreeing that given a choice, they would prefer not to work with AIDS patients. Although there was a good overall knowledge of the students about HIV/AIDS, negative attitudes were prevalent towards PLWH.

Key words: HIV/AIDS, Jordan, medical students, attitudes, stigma.

The human immunodeficiency virus (HIV) is a single-stranded RNA virus of the family retroviridae (retroviruses). It can be transferred through sexual contact (semen or vaginal fluid), blood or its products, and from infected mothers to their infants (during birth or through breast milk). There is still no evidence that shows that HIV can be transmitted by saliva, tears, sweat, aerosol, or insects. The transmission can occur when the infected fluid comes into contact with a damaged tissue or mucus membrane. Once infected, HIV invades many types of immune cells but it primarily affects CD4 (T helper) cells. The average time before HIV infection and the production of antibodies to it is 13-24 weeks and anti-HIV antibodies are a sign that a person is HIV carrier. Unfortunately, there is no proven effective vaccine against HIV virus and AIDS remains an incurable disease[1, 2].

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There is a social stigma associated with HIV/AIDS that is common to many cultures[3, 4]. However, stigma is more pronounced in Arabic and Muslim populations and consequently individuals are discouraged from voluntarily seeking HIV testing or continuing in medical follow-up[5, 6]. This stigma is more significant when it comes from health care providers, especially doctors; an intuitive conclusion that several studies confirmed[7]. This stigma could affect the quality of care of PLWH[8].

Many studies were conducted to measure the attitudes of medical students, the future doctors, toward PLWH. These studies found refusal to treat PLWH[9-11], believing that treating PLWH might be risky[9-12], association of negative attitudes with homophobia[9, 13], that having to deal with PLWH to affect specialty choice and location[9, 11], refusing to perform mouth-to-mouth resuscitation on PLWH[9, 10], among others.

Jordan is a small Middle Eastern country with an estimated population of 6.4 million[14]. The first HIV/AIDS case in Jordan was reported in 1986 and until 2013, the total number of reported HIV/AIDS cases was 1,022[15]. Future Jordanian doctors should be well informed about HIV/AIDS, among other infectious diseases. Jordan is undergoing considerable changes in the face of continuous waves of hundreds of thousands of Syrian refugees. Moreover, although that the Jordanian society is largely conservative, globalization and the new cultures introduced into the country may aid in spreading HIV. More importantly, a large percentage of Jordanian doctors work abroad, most notably as peacekeeping forces, in areas where HIV/AIDS is prevalent.

To the best of our knowledge, there are no previous studies that evaluated the knowledge of Jordanian medical students about HIV/AIDS or assessed their attitudes toward PLWH. The few conducted studies in Jordan were largely limited to healthcare workers, mainly nurses, and these studies showed mostly negative attitudes and even sometimes reluctance to provide medical service to PLWH[16-18].

Based on literature review and discussions with students, it was hypothesized that medical students at Mutah Medical School have average knowledge about HIV/AIDS and that they have negative attitudes about PLWH. Therefore, the objectives of this study were to assess Mutah Medical School students':

1) Evaluation of the teaching that they had received on HIV/AIDS-related topics and skills
2) General knowledge about HIV/AIDS
3) Knowledge about HIV transmission routes
4) Attitudes toward PLWH

MATERIALS AND METHODS

Study design

The study had a cross-sectional design and was conducted among clinical years medical students (from fourth to sixth year) at Mutah University, located in Karak governorate in South Jordan. Mutah Medical School was one of four medical schools in Jordan at the time this study was conducted and it has a teaching system similar to the rest of Jordanian medical schools. The study program at Mutah medical school spans six years and is divided into two stages: basic or pre-clinical (from first year till third year) and clinical (4^{th}-6^{th} years). During the pre-clinical years, students receive theoretical and practical teaching that is limited to the basic medical sciences. HIV/AIDS-related information is taught mainly within microbiology, public health, and epidemiology courses. Students start interacting with patients only at the beginning of clinical years (fourth-year). This study was limited to clinical years medical students because (1) they have finished the basic science subjects that allow them to learn in details about HIV/AIDS and because (2) they have a clinical experience that is needed to allow them to better understand the questions about caring and dealing with PLWH.

Study questionnaire

The study questionnaire consisted of five sections. The language of the questionnaire was English as this is the language of teaching of the students. The first section of the questionnaire asked for socio-demographic data (age, gender, nationality, gender, and university year). The second section asked students to evaluate the teaching that they had received on virology, recognition of blood-borne virus risk groups, sterilization practice and procedures, cross-infection precautions, and barriers use. The answers ranged from more than adequate to no

teaching received. The third section contained nine questions that assessed the students' knowledge about HIV/AIDS. This section also included questions about the cross-infection transmission risk. All of questions of the second and third sections, except some of the knowledge questions, were adopted from the study by Gilbert and Nuttall[19]. The fourth section asked if the students ever had an experience with PLWH in a clinical setting and, if yes, how did that experience affect their attitudes toward PLWH. It also asked if the students thought the HIV/AIDS is a problem in Jordan and if they recommend educating the public about it. The fifth and last section contained the 15-items Aids Attitudes Scale (AAS)[20]. This instrument was validated for measuring the attitudes of medical and nursing students toward AIDS patients. The students responded to each item using a six-point Likert scale (Strongly agree, agree, somewhat agree, somewhat disagree, disagree, and strongly disagree).

The phrasing of the questions and the design of the questionnaire were discussed with some students. The translation of hard-perceived words was added. The final questionnaire was piloted and it was found adequate for the target population.

Sample size

The number of medical students at Mutah University at the academic year of 2012/2013 was 946. Of which, 446 (47.1%) were in the clinical stage. Using the Kish formula[21] for sample size estimation at a 95% significance level and a 5% error margin, it was required to survey at least 207 students. To ensure equal representation of the different clinical years, the students were stratified by year.

Sample collection

Data collection took place in February 2013. In order to avoid convenience sampling, simple random sampling approach was followed and the questionnaires were distributed on different days and on different times on each day. Students were approached before and after lectures and seminars and were given the study questionnaire and an informed consent form. The consent form informed the students about the goals and procedures of the research, any questions they had were answered, and then those who agreed to participate were asked to write their names on the consent form and sign it. To ensure anonymity, the consent forms were firstly collected separate from the questionnaires. During filling the questionnaires, the students were instructed not to discuss the answers with their colleagues. For the question that asked for opinion, the students were instructed to answer with the first opinion that would cross their minds.

Statistical analysis

Data was entered and analyzed using SPSS software version 18.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to analyze the survey responses.

Ethics approval

This study was approved by the Ethics and Scientific Committees of the Faculty of Medicine at Mutah University.

RESULTS

Sample characteristics

A total of 209 4th-6th-year students filled the study questionnaire. Of the sample, 105 were males (50.2%) and 104 were females (49.8%). The mean age was 22.6 ± 1.08 years (range: 20-25 years). Jordanians constituted the majority of the sample (92.3%). The numbers of students from fourth-, fifth- and sixth-years were 48 (23.0%), 73 (34.9%) and 88 (42.1%), respectively.

Student's evaluation of the teaching they had received

Table 2 shows the students' evaluation of the teaching that they had received on five topics related to HIV/AIDS. More than half of the students reported that they had more than adequate/adequate teaching on four of these five topics; the highest percentage was reported for "recognition of blood-borne virus risk groups" (62.2%). On the other hand, the lowest percentage was reported for cross-infection precautions with only 42.6% of students reporting that they had "more than adequate/adequate teaching" on cross-infection precautions.

Evaluation of knowledge about HIV transmission routes

The students' knowledge regarding the potential routes of HIV transmission is shown in table 3. The largest number of "Don't know" answers was to the two questions about the in inhalation of aerosol containing the saliva and blood of HIV positive patients (13.9% and 13.4%

of students, respectively). On the other hand, the majority of students knew that there is no risk of HIV transmission because of the contact of unbroken skin with the unbroken skin (88.0%), saliva (87.6%) and blood (81.8%) of HIV positive patients. Sixty-one percent of students mistakenly thought that the saliva of HIV positive patients could transmit HIV when it comes into contact with their unbroken skin. Nonetheless, 94.7% correctly reported that there is a risk of HIV transmission when their cut skin comes in contact with blood of HIV positive patients.

Evaluation of general knowledge about HIV/AIDS

Table 4 shows the answers to nine questions that assessed students' knowledge about HIV/AIDS. The four questions with the highest percentage of correct answers were that AIDS is not a curable disease (95.2%), that T-lymphocytes are the primarily host defense cells affected in AIDS (90.4%), that AIDS is not a vaccine-preventable disease (88.5%) and the meaning of HIV is an agent that causes AIDS (79.5%). On the other hand, the question with the lowest number of correct answers was the question about the average time interval between contracting HIV and the production of antibodies to it (Only 5.8% chose the correct the answer of 3-24 weeks). This was followed by the question about the risk of a pregnant woman passing HIV to her infant (Only 15% answered correctly 10-15%). Moreover, only 76.6% and 57.4% of students answered that HIV cannot be spread by flies and mosquitoes, respectively. In addition, 64% of students knew that if an individual was demonstrated to carry anti-HIV antibodies, then he is an HIV carrier.

Attitudes toward PLWH

Table 5 shows the students' answers to the 15 statements of the AAS. The statements that students mostly agreed to were that AIDS make their job a high risk occupation (88.8%), that it is better to train a few specialists who would be responsible for the treatment of AIDS patients (83.7%), and that they feel angry about the risk of AIDS which homosexuals had imposed on the straight community (83.6%). Interestingly, almost a third of the students (32.1%) reported that they would change their professional specialty/position if it became necessary to work with AIDS patients. Moreover, the students displayed negative attitudes toward PLWH. For example, almost two third of students (64.9%) reported that they would rather work with a better class of people than AIDS patients. Moreover, a slightly smaller percentage

Table 1. Students' evaluation of the teaching that they had received on five topics related to HIV/AIDS

	More than Adequate/ adequate	Less than adequate/ no teaching received
Recognition of blood-borne virus risk groups (n = 209)	130 (62.2)	79 (37.8)
Virology (n = 208)	120 (57.7)	88 (42.3)
Barriers (e.g., gloves, masks, protective eyewear) (n = 207)	114 (55.1)	93 (44.9)
Sterilization practice and procedures (n = 207)	109 (52.7)	98 (47.3)
Cross-infection precautions (n = 209)	89 (42.6)	120 (57.4)

Table 2. Students' knowledge of HIV transmission routes

		Yes	No	Don't know
Your unbroken skin is in contact with:	blood of HIV positive patient (n = 209)	36 (17.2)	171 (81.8)	2 (1)
	saliva of HIV positive patient (n = 209)	22 (10.5)	183 (87.6)	4 (1.9)
	unbroken skin of HIV positive patient (n = 209)	22 (10.5)	184 (88.0)	3 (1.4)
Your cut skin is in contact with:	unbroken skin of HIV positive patient (n = 207)	35 (16.9)	163 (78.7)	9 (4.3)
	blood of HIV positive patient (n = 208)	197 (94.7)	8 (3.8)	3 (1.4)
	saliva of HIV positive patient (n = 208)	127 (61.1)	65 (31.3)	16 (7.7)
Inhalation of aerosol containing:	blood of HIV positive patient (n = 209)	68 (32.5)	113 (54.1)	28 (13.4)
	saliva of HIV positive patient (n = 209)	47 (22.5)	133 (63.6)	29 (13.9)

(68.6%) said that they would prevent their child to go to school with a child with AIDS. Students do not seem confident of the efficacy of protection measures against HIV with 78.1% of students afraid of catching AIDS despite all what they know how AIDS is transmitted and 56.3% thinking that they even following strict infection control measures, it is likely that they would become infected with HIV if they were asked to work with AIDS patients over a long period of time.

Regarding if the students had an experience with an HIV/AIDS patient in a clinical setting, unsurprisingly, only 17 students (8.2%) answered with yes. Regarding the effect of this experience on these students' attitudes and opinion, the most common answer was that "nothing changed" (7 students, 41.2%). This was followed by "negatively", chosen by six students

Table 3. Nine questions assessing the knowledge of students about HIV/AIDS

Question	The possible answers	No (%) of students who selected the answer
Which host defense cells are primarily affected in AIDS? (n = 209)	Macrophages	1 (0.5)
	B-lymphocytes	11 (5.3)
	Phagocytes	0 (0)
	T-lymphocytes*	189 (90.4)
	Don't know	8 (3.8)
If an individual is demonstrated to carry anti-HIV antibodies, are they: (n = 206)	Definitely suffering from AIDS	41 (19.9)
	Immune to HIV infection	33 (16)
	An HIV carrier*	95 (46.1)
	Don't know	37 (18)
What is the average time interval between contracting HIV and the production of antibodies to it? (n = 206)	Less than six weeks	18 (8.7)
	6–12 weeks	32 (15.5)
	13–24 weeks*	12 (5.8)
	24 weeks–25 years	51 (24.8)
	Don't know	93 (45.1)
Meaning of HIV is: (n = 209)	AIDS disease	21 (10)
	Agent that causes AIDS*	166 (79.4)
	Sexually transmitted disease	12 (5.7)
	People infected with the AIDS agent	6 (2.9)
	Don't know	4 (1.9)
The risk of an infected mother passing HIV to her infant is: (n = 207)	0	0 (0)
	10–15%	19 (9.2)
	15–30%*	31 (15)
	50–70%	47 (22.7)
	100%	57 (27.5)
	Don't know	53 (25.6)
HIV can be spread by flies: (n = 209)	No*	160 (76.6)
	Yes	20 (9.6)
	Don't know	29 (13.9)
HIV can be spread by mosquitoes: (n = 209)	No*	120 (57.4)
	Yes	62 (29.7)
	Don't know	27 (12.9)
AIDS is a vaccine-preventable disease: (n = 209)	No*	185 (88.5)
	Yes	6 (2.9)
	Don't know	18 (8.6)
AIDS is a curable disease: (n = 209)	No*	199 (95.2)
	Yes	4 (1.9)
	Don't know	6 (2.9)

*correct answers

(35.3%), while only four students (23.5%) answered with "positively". Finally, although only 115 students (55.3%) agreed that HIV/AIDS is a problem in Jordan, almost all students (204 students, 94.7%) agreed to a statement that they would recommend public education about HIV/AIDS in Jordan.

DISCUSSION

Our study was the first to assess the knowledge and attitudes of Jordanian medical students about HIV/AIDS and their attitudes toward PLWH. We believe that this study showed that students at Mutah Medical School have average knowledge about HIV. This is also supported by the result that fewer than two thirds of the students were satisfied about the teaching they had received about HIV/AIDS. What is concerning is that many students had clear negative attitudes toward PLWH.

More than half of the students reported having more than adequate/adequate teaching on four out of five topics related to HIV/AIDS. Unfortunately, the topic that the students least reported receiving teaching on was "cross-infection" precautions (42.6%). This is much lower than reported by 5th year dental students at the University of Jordan, where 86.8% of students reported adequate/more than adequate teaching in this field[22]. These figures could indicate that the future doctors have limited ability to protect themselves against HIV/AIDS and other infectious diseases. However, this assessment is subjective and therefore we suggest assessment of this item through a comprehensive questionnaire on cross-infections to obtain a more valid assessment of the taught material at our medical school. If the results are consistent with students' self-assessment, we believe there will be an urgent need for improvement in this area.

Our sample had better knowledge about the route of HIV transmission than fifth-year dental students at the University of Jordan. The majority of the students in this study were aware that the contact of uncut skin with blood (81.8%) or saliva (87.7%) of HIV patients will not transmit the infection, compared with 34.2% of fifth-year medical students at the University of Jordan for both answers[22]. Gaps in knowledge in transmission routes was also found in other studies[11, 12]. A study from India showed that a substantial proportion of students believe that HIV/AIDS could be transmitted by contact, saliva, urine and feces, and mosquitoes. It was also a concern that 36% of participants in the Indian study were unaware that tattooing was a risk factor for HIV transmission[10].

Poor knowledge about HIV/AIDS was demonstrated as a key factor for stigma against PLWH (23, 24). As a result, the future doctors would be discouraged from making contact with PLWH. This was already shown in our study; e.g., 67% of students answered that they would "prefer to refer persons with AIDS to [their] professional colleagues". Refusal to treat or preferring not to have PLWH as patients was found in many studies[9-11]. Negative attitudes would certainly hinder the provision of high-quality services for PLWH[8]. In our study, 60% of participants reported that if they were given a choice, they would prefer not to work with AIDS patients. These results are better than a study from Barnados, which showed that only 22.7% of medical students are willing to work with PLWH[25]. Interestingly, results from an Indian study showed that although 56% of students were worried that working with PLWH might be risky, only 3% of them reported that they would prefer not to care for patients with HIV/AIDS[10]. The global differences in attitudes toward PLWH could be affected by difference in the knowledge, epidemiology of HIV, and presence of specific training on dealing with such patients[11].

One suggested method to address the negative attitudes of medical students toward PLWH is by raising awareness of students about the implications of HIV/AIDS on the society and the world as a whole. A study from Canada showed an increased readiness among medical students to treat the local PLWH following a global health education session on the difficulty in treating HIV in developing countries[26]. A review on Chinese health care providers attitudes about HIV and another review on nurses attitudes toward these patients support these this suggested method[23, 27].

Only 8.2% of the students in our study reported having contact with an HIV/AIDS patient in a clinical setting. This percentage is expected when taking into consideration that the total number of reported HIV/AIDS cases in Jordan until

the year of 2013 was 1,022[15]. However, the likelihood of having contact with HIV/AIDS patients is often more when the graduates work in other countries.

CONCLUSIONS

Our study results show that Medical Students at Mutah University have average knowledge about HIV/AIDS. We found that some gaps in the knowledge exist especially in HIV's transmission-related information. The students have moderate negative attitudes toward PLWH and this could reflect the gaps in knowledge when it comes to transmission routes and cross-infection precautions in addition to the low percentage of students who previously had exposure to PLWH. The results of this study could serve as a basis for future curricular changes or campaigns that aim to equip the students with more knowledge and skills necessary for dealing with patients with serious infectious diseases, such as HIV. Further work is recommended in Jordan to address future physicians' prejudices toward PLWH and to improve their attitudes toward such patients.

Limitations of the study

The limitation of this study was that the assessment of the teaching received was based on students' self-evaluation not based on a validated assessment.

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REFERENCES

1. Longo, D., Fauci, A., Kasper, D., Hauser, S., Jameson, J., Loscalzo, J. Harrison's principles of internal medicine. McGraw Hill Professional; 2011.
2. CDC. HIV Transmission 2014 [01/05/2015]. Available from: http://www.cdc.gov/hiv/basics/transmission.html.
3. Herek, G.M., Capitanio, J.P., Widaman, K.F. HIV-related stigma and knowledge in the United States: prevalence and trends, 1991-1999. *American journal of public health*. 2002; **92**(3): 371-7.
4. Obermeyer, C.M. HIV in the Middle East. *BMJ*. 2006; **333**(7573): 851-4.
5. GaDczak, M., Barss, P., Alfaresi, F., Almazrouei, S., Muraddad, A., Al-Maskari, F. Break the silence: HIV/AIDS knowledge, attitudes, and educational needs among Arab university students in United Arab Emirates. *Journal of Adolescent Health*. 2007; **4**0(6):572. e1-. e8.
6. Tavoosi, A., Zaferani, A., Enzevaei, A., Tajik, P., Ahmadinezhad, Z. Knowledge and attitude towards HIV/AIDS among Iranian students. *BMC public health*. 2004; **4**(1):17.
7. Kinsler, J.J., Wong, M.D., Sayles, J.N., Davis, C., Cunningham, W.E. The effect of perceived stigma from a health care provider on access to care among a low-income HIV-positive population. *AIDS Patient Care and STDs*. 2007; **21**(8): 584-92.
8. Valdiserri, R.O. HIV/AIDS stigma: an impediment to public health. *American journal of public health*. 2002; **92**(3): 341-2.
9. Kopacz, D.R., Grossman, L.S., Klamen, D.L. Medical students and AIDS: knowledge, attitudes and implications for education. *Health Education Research*. 1999;**14**(1):1-6.
10. Mohsin, S., Nayak, S., Mandaviya, V. Medical students' knowledge and attitudes related to HIV/AIDS. *National Journal of Community medicine*. 2010; **1**(2):146-9.
11. Baytner-Zamir, R., Lorber, M., Hermoni, D. Assessment of the knowledge and attitudes regarding HIV/AIDS among pre-clinical medical students in Israel. *BMC research notes*. 2014; **7**(1): 168.
12. Michael, P., Pham, H.N., Nguyen, H.V. Knowledge of HIV and factors associated with attitudes towards HIV among final-year medical students at Hanoi medical university in Vietnam. *BMC public health*. 2014; **14**(1): 265.
13. Varas-Díaz, N., Neilands, T.B., Cintrón-Bou, F., Santos-Figueroa, A., Rodríguez-Madera, S., Santiago-Negrón, S. The role of Gender on HIV/AIDs stigma among Medical students in puerto rico: Implications for training and service Delivery. *Puerto Rico Health Sciences Journal*. 2012; **31**(4).
14. Jordanian Department of Statistics. Yearly Jordanian Statistical Book, No. 63. 63 ed: Department of Statistics, Jordan; 2012 2012.
15. Ministry of Health - Jordan. Cummulative AIDS/HIV cases in Jordan by Nationality 2013 [29/07/2014]. Available from: http://www.moh.gov.jo/EN/Pages/mainind.aspx? ind= http% 3a//apps.moh.gov.jo/reports/headermain. jsp? firstjsp=epimedsituationmenu &lang_

parameter=english.
16. Alkhasawneh, E., Ismayilova, L., Olimat, H., El-Bassel, N. Social and behavioural HIV/AIDS research in Jordan: a systematic review. *Eastern Mediterranean Health Journal*. 2012;**18**(5).
17. Fathieh Suliman Saleh, R. Nurses' and Physicians' Attitudes towards aids in jordan. *JRMS*. 2002; **9**(2): 51-5.
18. 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): 318-22.
19. Gilbert, A.D., Nuttall, N.M. Knowledge of the human immunodeficiency virus among final year dental students. *Journal of dentistry*. 1994; **22**(4): 229-35.
20. Bliwise, N.G., Grade, M., Irish, T.M., Ficarrotto, T.J. Measuring medical and nursing students' attitudes toward AIDS. *Health Psychology*. 1991; **10**(4): 289.
21. Kish, L. Survey sampling. 1965.
22. Ryalat, S.T., Sawair, F.A., Shayyab, M.H., Amin, W.M. 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**(1):191.
23. Webber, G. Chinese health care providers' attitudes about HIV: a review. *AIDS care*. 2007; **19**(5): 685-91.
24. Brown, L., Macintyre, K., Trujillo, L. Interventions to reduce HIV/AIDS stigma: what have we learned? *AIDS Education and Prevention*. 2003;**15**(1):49-69.
25. Ojeh, N., Gaur, U. A Study to Assess the Level of Awareness of Medical Students in Barbados to HIV and AIDS. *International Journal of Collaborative Research on Internal Medicine & Public Health (IJCRIMPH)*. 2014;6(2).
26. Ibrahim, G., Hoffart, S., Lam, R., Minty, E., Ying, M., Schaefer, J. Think global, act local: Medical students contextualize global health education. *Education for Health*. 2014; **27**(1): 55.
27. Pickles, D., King, L., Belan, I. Attitudes of nursing students towards caring for people with HIV/AIDS: thematic literature review. *Journal of advanced nursing*. 2009; **65**(11): 2262-73.