The Investigation of Knowledge About and Attitude Toward HIV Among Healthcare Professionals in a Tertiary Hospital

Üçüncü Basamak Bir Hastanede Sağlık Çalışanlarının HIV Konusunda Bilgi ve Davranış Biçimlerinin Araştırılması

HIV/AIDS Araştırması / The Investigation of HIV/AIDS

Yeşim Çekin[1], Aygül Özdemir[2], Yeşim Yiğiter Şenol[3], Ayhan Hilmi Çekin[2]
[1]Department of Microbiology, [2]Department of Internal Medicine, Antalya Training and Research Hospital,
[3]Department of Medical Education, Akdeniz University Faculty of Medicine, Antalya, Turkey

Özet

Amaç: Bu çalışma sağlık çalışanlarının HIV/AIDS konusundaki bilgi düzeyini incelemek, bu konudaki tutumlarını araştırmak ve verdikleri önemi belirlemek üzere tasarlanmıştır. Gereç ve Yöntem: Laboratuvar teknisyenleri (n=54), ameliyathane çalışanları (n=60) ve servis hemşireleri (n=96) olmak üzere 210 sağlık çalışanı araştırmaya dahil edilmiştir. Katılımcıların HIV/AIDS konusunda bilgi düzeylerini (n=19), tutumlarını (n=3), bilgi kaynaklarını ve hastalığa dünyada ve Türkiye'de verilen önemi ölçen toplam 27 sorudan oluşan kişilerin gönüllü katılımına dayalı bir anket uygulanmıştır. Bulgular: Katılımcılar arasında ameliyathane çalışanları (13.4±1.8); laboratuvar teknisyenleri (12.2±2.5) ve servis hemşirelerine (12.4±1.9) oranla ortalama bilgi düzeyi en yüksek grup olarak saptanmıştır (p<o.o1). HIV/AIDS hastalarını tedaviye istekliliği karşılaştırıldığında gruplar arasında istatistiksel bir fark bulunmamıştır. Tartışma: Üçüncü basamak sağlık hizmeti veren kurumumuzda, hastane çalışanları HIV/AIDS konusunda orta düzeyde bilgiye sahiptirler ve bu grup hastayı tedavi etmek ve örneklerini çalışmak konusunda pozitif tutum içindedirler.

Anahtar Kelimeler

Sağlık Çalışanları, HIV/AIDS, Tutum, Bilgi

Abstract

Aim: This study was designed to examine the level of knowledge about, to investigate attitudes toward, and to determine the emphasis given to HIV/AIDS among healthcare professionals. Material and Method: A total of 210 healthcare professionals employed as a laboratory (n=54), operating room (n=60) or in-patient clinic (n=96) staff were included in this descriptive study. A 27-item questionnaire composed of questions related to level of knowledge about HIV/AIDS (n=19), attitudes toward HIV/AIDS (n=3), sources of knowledge on HIV/AIDS (n=3) and emphasis given national and global importance of the disease (n=2) was applied to each subject, based on voluntary participation. Results: Participants working in operating room obtained the highest mean (SD) knowledge scores 13.4(1.8) vs. 12.2(2.5) for laboratory and 12.4(1.9) for in-patient clinic staff ; p<0.01). There was no significant difference between participants working in operating room (51.9%), laboratory (41.7%) and in-patient clinic (44.8%) in terms of willingness to treat a HIV/AIDS patient. Discussion: In conclusion, our findings indicate moderate level of knowledge on HIV/AIDS and positive attitudes toward a patient with HIV/AIDS among healthcare professionals employed in a tertiary healthcare center.

Keywords

Healthcare Workers, HIV/AIDS, Attitude, Knowledge

DOI: 10.4328/JCAM.1057 Received: 30.04.2012 Accepted: 27.05.2012 Printed: 01.07.2013 J Clin Anal Med 2013;4(4): 291-6
Corresponding Author: Ayhan Hilmi Çekin, Uluc Mah., 24. Cadde 1164 Sok., Sefik Aker Sitesi B Blok Daire: 10 Konyaaltı, Antalya, Türkiye.
GSM: +905323614871 E-Mail: ayhancekin@hotmail.com

Introduction

Acquired immune deficiency syndrome (AIDS) develops following infection with the human immunodeficiency virus (HIV) which is an acquired contagion with an estimated 42 million people infected globally with the first deaths reported in the early 1980s and around 20 million people have since died from AIDS [1].

A report from Joint United Nations Programme on HIV/AIDS (UNAIDS) in 2009 stated that approximately 35,000 people (range 524,000–46,000) in the Middle East and North Africa region, including Turkey, were infected with HIV. According to data of Ministry of Health Department in our country, first two cases were reported in 1985 and the number of HIV/AIDS cases increased from 2,544 in 2007 to 3671 by 2009.

Therefore HIV/AIDS remains a major health problem, as the number of individuals suffering from the disease across the globe has been on the increase since the early 1980s when the disease was identified [2].

Exposure to blood and body fluids is a critical occupational concern for healthcare workers (HCWs) and represents a major risk for the transmission of human immunodeficiency virus (HIV) [3]. The Centres for Disease Control and Prevention (CDC) estimated that, in the United States, up to 5000 HIV exposures may occur annually among health care workers [4]. With the spread of HIV and prolonged survival of patients in many Western countries due to the development of more effective treatments [1], increasing numbers of health care professionals are becoming involved in the care and treatment of these patients [5].

Accordingly, while universal precautions recommend protection and preventive measures in case of contact of HCWs with mucous membranes, blood and body fluids of patients with bloodborne infections such as HIV; suboptimal adherence by HCWs to these precautions has been reported extensively [3].

The health care setting has been reported to be a context where stigmatization and discrimination against people having HIV/AIDS are evident [6]. Negative attitudes towards patients living with HIV/AIDS as stated in a review of past studies that indicated 10%–20% of health care workers, including nurses, doctors, dentists and laboratory technicians to exhibit discriminatory behaviors towards PHA in the form of inappropriate comments, breaches of confidentiality, delayed treatment, or refusal of treatment [6-8].

Inadequate knowledge about the disease (i.e., its infection route, course, and treatment), persistent worry and exaggerated fear of contraction through the caring of PHA, and inadequate awareness of and sensitivity to the negative consequences of discrimination towards PHA were suggested among several possible reasons for HCWs negative attitudes and discriminatory behaviors towards PHA [8].

Based on the fact that the reluctance of HCWs to offer treatment for HIV-positive individuals limits access of patients to care along with already existing staff shortages, the present study was designed to examine the level of knowledge about, to investigate attitudes toward, and to determine the emphasis given to national and global prevalance of HIV/AIDS among healthcare professionals working in a tertiary hospital in Turkey [9].

Material and Method

Study population

A total of 210 healthcare professionals mean(SD) age: 37.0 (6.3) years; 83.8% were females) employed in Antalya Training and Research Hospital, Antalya, Turkey as a laboratory (n=54), operating room (n=60) or in-patient clinic (n=96) staff were included in this descriptive study. Basically, medical laboratory technicians (n=54) employed in laboratory and nurses (n=156) employed in operating room or in-patient clinic were surveyed.

Written informed consent was obtained from each subject following a detailed explanation of the objectives and protocol of the study which was conducted in accordance with the ethical principles stated in the "Declaration of Helsinki" and approved by the institutional ethics committee.

Data collection

An 27-item questionnaire composed of questions related to level of knowledge about HIV/AIDS (n=19), attitudes toward HIV/AIDS (n=3), sources of knowledge on HIV/AID (n=3) and emphasis given national and global importance of the disease (n=2) was applied via face to face interview method to each subject, based on voluntary participation.

The level of knowledge about HIV/AIDS among healthcare professionals was evaluated via answers given to 19 questions concerning carriage, transmission, prevention and diagnosis of HIV prepared in the "true", "false" and "do not know" format. Overall score (range: 0-19) was determined based on sum of correct answers given to 19 questions for each individual. Knowledge level was considered to be poor, moderate and advanced for score of 0-6, 7-13 and 14-19, respectively.

Following three questions (items 20-22) to measure the attitudes of healthcare professionals toward HIV/AIDS were "Do you feel disturbed if you work with an individual with AIDS in the same unit?", "Do you treat or collect/study blood sample of an HIV/AIDS patient?" and "What will be your attitude to a friend that you have recently learned if he/she has HIV/AIDS?". The first two were Yes/No/Uncertain question types while the last one included choices of "no change/get away from/feel pity towards/try to help" with respect to attitude.

Next three questions (items 23-25) examined the sources of knowledge on HIV/AIDS, while the last two items (items 26-27) were related to scoring of national and global importance given to HIV/AIDS according to participants based on 1 to 10 rating scale, indicating low (ratings of 1-4), moderate (ratings of 5-7) and very high (ratings of 8-10) importance.

Statistical Analysis

Statistical analysis was made using computer software (SPSS version 11.0, SPSS Inc. Chicago, IL, USA). The level of knowledge about HIV/AIDS was determined based on sum of overall correct answers given to 19 questions by each individual. The average scores obtained for level of knowledge were compared via t test, One-way ANOVA and Chi-square (x2) tests. Data were expressed as "mean (standard deviation; SD)", minimum-maximum and percent (%) where appropriate. $p<0.05$ was considered statistically significant.

Results

Demographic features, duration of job and exposure to risk among participiants according to hospital units

Females composed majortiy of our study population (83.8%) and 63.0, 83.3 and 100.0% of participants working in laboratory, operating room and in-patient clinic, respectively. Duration of job was identified to be 11-20 years in most of the subjects working in operating room (55.0%) and in-patient clinic (57.3%), while identified to be ≥ 21 years in 50.0% of participants employed in laboratory. Exposure to risk was evident in 24.1, 26.7 and 24.0% of of participants working in laboratory, operating room and in-patient clinic, respectively (Table 1).

Table 1. Demographic features, duration of job and exposure to risk among participiants according to hospital units (N=210)

	Laboratory (n=54)	Operating room (n=60)	In-patient clinic (n=96)
Gender		n(%)	
Male (n=34)	24 (37.0)	10 (16.7)	0 (0.0)
Female (n=176)	30 (63.0)	50(83.3)	96 (100.0)
		Mean(SD)	
Age (years)	38.9 (7.2)	35.6 (6.1)	36.7 (5.5)
Duration of job		n(%)	
1-10 years	5(9.3)	18(30.0)	18(18.8)
11-20 years	22(40.7)	33(55.0)	55(57.3)
≥ 21 years	27(50.0)	9(15.0)	23(24.0)
Exposure to risk			
Yes	13(24.1)	16(26.7)	25(26.0)
No	41(75.9)	44(73.3)	71(74.0)

Table 2. Overall scores of knowledge level based on count of correct answers and distribution of positive attitudes toward HIV/AIDS amongst participants with respect to hospital units

	Laboratory (n=54)	Operating room (n=60)	In-patient clinic (n=96)
Knowledge level about HIV/AIDS		Mean (SD)	
Total score	12.2(2.5)	13.4(1.8)*	12.4(01.9)
		n(%)	
0-6 (poor)	2(3.7)	0(0)	0(0)
7-13 (moderate)	33(61.1)	35(58.3)	70(72.9)
14-19 (advanced)	19(35.2)	25(41.7)	26(27.1)+
Attitude toward HIV/AIDS			
Do you feel disturbed if you work with an individual with AIDS in the same unit?; n(%)			
No	11(20.4)	29(48.3)**	26(27.1)
Do you treat or collect/study blood sample of an HIV/AIDS patient?" n(%)			
Yes	28(51.9)	25(41.7)	43(44.8)
What will be your attitude to a friend that you have recently learned if he/she has HIV/AIDS?; n(%)			
There'll be no change in my attitude	11(20.8)	14(23.3)	34(35.8)+
I get away from him/her as soon as possible	1(1.9)	4(6.7)	3(3.2)
I feel pity towards him/her	2(3.8)	2(3.3)	52(54.7)++
I try to help	33(62.3)	32(53.3)	6(6.3)++
Other	6(1.3)	8(13.3)	0(0.0)

*p<0.05 and **p=0.001; compared to participants working in laboratory and in-patient clinic
+p<0.05 and ++p=0.001; compared to participants working in laboratory and operating room

Knowledge level and distribution of positive attitudes toward HIV/AIDS amongst participants with respect to hospital units

Mean (SD) number of total correct answers was significantly higher in participants working in operating room (13.4±1.8) compared with laboratory (12.2±2.5) and in-patient clinic (12.4±1.9) staff (p<0.01; Table 2). When evaluated according to distribution of knowledge level, most of the subjects were identified to have moderate degree of knowledge concerning HIV/AIDS composing 61.1, 58.3 and 72.9% of participants working in laboratory, operating room and in-patient clinic, respectively. There were significanlty lower percentage of participants with advanced degree of knowledge in the in-patient clinic staff (27.1%) compared to laboratory (35.2%) and operating room (41.7%) staff (p<0.05; Table 2).

Considering positive attitudes toward HIV/AIDS, significantly higher number of participants working in operating room (48.3%) than in laboratory (20.4%) and in-patient clinic (27.1%) identified that they dont feel disturbed if they work with an individual with AIDS in the same unit (p<0.001, Table 2). There was no significant difference between participants working in operating room (51.9%), laboratory (41.7%) and in-patient clinic (44.8%) in terms of willingness to treat or collect/study blood sample of an HIV/AIDS patient (Table 2).

Considering attitude to a friend that recently diagnosed with HIV/AIDS, "I try to help" was the most commonly identified option for participants working in laboratory (62.3%) and operating room (53.3%) while "I feel pity towards him/her" was the most commonly identified attitude by participants working in in-patient clinic (54.7%; Table 2).

Past education and source of information about HIV/AIDS

Past education concerning HIV/AIDS was confirmed by significantly higher number of participants working operating room (65.0%) than in laboratory (55.6%) and in-patient clinic (49.0%) (p<0.05, Table 3). The main source of information was identified to be conference and congress in 56.4, 46.7 and 56.7% of participants working in laboratory, operating room and in-patient clinic, respectively (Table 3). Albeit not significant, the percantage of participants indicating faculty lectures as the source of information was higher in operating room (33.3%) than laboratory (10.3%) and in-patient clinic (15.0%). Likewise, although not significant statistically, the extent of lectures on HIV/AIDS was identified to be adequate by higher number of participants working in operating room (23.3%) than laboratory (13.0%) and in-patient clinic(16.7%).

Significantly lesser number of participants working in the operating room (28.3%) identified the importance given to HIV/AIDS in our country to be very high compared to participants working in laboratory (41.7%) and in-patient clinic (50.0%) (p<0.05; Table 3). Likewise, albeit not significant, lower number of participants working in operating room (38.3%) indicated the global importance given to HIV/AIDS to be very high compared to participants working in laboratory (51.8%) and in-patient clinic (49.0%) (Table 3).

Discussion

Knowledge, training, and experience needed to care for HIV-infected patients is a life-long process necessitating keeping up with the new knowledge that accumulates in the published data for HIV on almost a daily basis. However, despite high levels of knowledge essential to make decisions in the event of an occupational exposure to HIV and care issues for HIV-infected

Table 3. Past education concerning HIV/AIDS and scoring of national and global importance given to HIV/AIDS amongst participants with respect to hospital units

	Laboratory (n=54)	Operating room (n=60)	In-patient clinic (n=96)
Education about HIV/AIDS	n(%)	n(%)	n(%)
Yes	30(55.6)	39(65.0)*	47(49.0)
Source of information			
Conference-congress	23 (58.9)	21(46.7)	34(56.7)
Internet-news-paper	8(20.5)	3(6.7)	9(15.0)
Faculty lectures	4(10.3)	15(33.3)	9(15.0)
High school lectures	3(7.7)	6(13.3)	8(13.3)
Family, friends	1(2.6)	0(0)	0(0)
Missing data	15	15	36
Do you find extent of the lectures on HIV/AIDS adequate?			
Yes	7(13.0)	14(23.3)	16(16.7)
The importance given to HIV/AIDS in our country			
low (ratings of 1-4)	19(19.8)	26(43.4)*	15(27.8)
moderate (ratings of 5-7)	37(38.5)+	17(28.3)	12(22.2)
very high (ratings of 8-10)	40(41.7)	17(28.3)*	27(50.0)
The importance given to HIV/AIDS in the world			
low (ratings of 1-4)	11(20.5)	19(31.7)	19(19.7)
moderate (ratings of 5-7)	15(27.7)	18(30.0)	30(31.3)
very high (ratings of 8-10)	28(51.8)	23(38.3)	47(49.0)

*p<0.05; compared to participants working in laboratory and in-patient clinic
+p<0.05; compared to participants working in operating room and in-patient clinic

patients, health professionals often documented to lack basic knowledge about HIV [10, 11].

Our findings concerning knowledge about HIV/AIDS among healthcare professionals working in a tertiary hospital in Turkey revealed moderate degree of knowledge in most of the HCWs regardless of the hospital unit as well as exposure to risk, while the highest knowledge scores were identified among operating room staff compared with HCWs epmloyed in laboratory and in-patient clinic units of our hospital.

Identification of moderate degree of knowledge on HIV/AIDS regardless of the hospital unit in our study population comprising 25.7% medical laboratory technicians and 74.3% nurses is in line with the results of a survey of 4615 health care workers, comprising 70% doctors and nurses and 30% medical laboratory technicians, occupational therapists, radiographers, physiotherapists and optometrists which showed that respondents had only moderate levels of AIDS knowledge [8].

HCWs with low levels of AIDS knowledge were reported to show more avoidance towards PHA and less willingness to serve PHA while the anxiety associated with inadequate AIDS knowledge, fear of contagion, and low perceived self-efficacy in the caring of PHA has been reported to exacerbate the discrimination towards PHA [8].

In this regard, in relation to higher overall knowledge scores and higher percentage of past education about HIV/AIDS, more of healthcare professionals working in the operating room identified that they don't feel disturbed if they work with an individual with AIDS in the same unit compared to other hospital units. However, discrimination towards PHA was evident for a friend or collague diagnosed with HIV/AIDS among healthcare professionals working in the in-patient clinic who had the lowest number members with advanced level of knowledge on HIV/AIDS in our study population.

Indeed, evidence for discrimination towards PHA for a friend or collague but not for a patient diagnosed with HIV/AIDS among our in-patient clinic HCWs seems to indicate more professional and realistic approach of in-patient staff towards patients than collagues or friends in their social environment despite their lower degree of knowledge.

In this context, it is noteworthy that healthcare professionals in our population identified similar positive attitude toward willingness to treat or collection/study of blood sample of an HIV/AIDS patient.

Indeed, it has been acknowledged that many risk factors in Turkey contribute to the expansion of the HIV epidemic and that the relatively low number of reported cases may be attributed to inadequacies in the surveillance system [12].

The affective components of contact (e.g., fear, anxiety, empathy) were documented to have greater impact than the cognitive components (e.g., knowledge) in stigma reduction [13]. Hence, while healthcare professionals working in the in-patient clinic had the lowest degree of knowledge, they composed the major group of study population that indicate feeling pitty and no change in attitude towards a friend who have learned that he/she has HIV/AIDS recently. Nevertheless quite in relation to the fear of contagion, they also comprised the group with the least number of members to identify that they try to help a friend with HIV/AIDS.

Indeed, most educational programs to enhance competency in serving HIV/AIDS were documented to be effective in increasing AIDS knowledge and tolerance to PHA, but failed to reduce stigmatizing attitudes and fear of contracting HIV [8]. Moreover, that fear of contagion, as a symbolic response to threats or disapproval of the actual or presumed lifestyles of PHA rather than the infection of the disease was stated to be a reaction to the requirement of providing care to those whom they perceived behaved against social and cultural values [8,14].

In this regard, despite identification of empathetic and compassionate attitudes, identification of being voluntary to help a friend with HIV/AIDS only by 6.3% of our in-patient clinic staff compared to staff in laboratory and operating room may be interpreted in terms of this symbolic response.

As a matter of fact, no reluctance to care for people with HIV/AIDS among in-patient staff while lack of such a positive attitude toward a colleague or friend seems to emphasize the controversy between response to actual or presumed lifestyles of PHA and response to the infection of the disease in these subjects.

In this regard, while increasing intergroup knowledge, reducing intergroup fear and anxiety, and enhancing intergroup empathy and perspective taking were indicated as the three main mediators for the contact-prejudice effect, fear and anxiety were stated to account for the largest contact-prejudice effect, whereas

knowledge had the lowest [8,13].

Therefore, considering the risk of jeopardy in PHA's physical and psychosocial well-being due to stigma and (fear of) discrimination among HCWs, identification of more professional and realistic approach of our HCWs toward a patient with HIV/AIDS regardless of unit of hospital as well as level of knowledge seems worth noting.

Besides half of participants working in in-patient service and laboratory units but less than one-third of participants working in operating room considered the importance given to HIV/AIDS in our country as well as in the world to be very sufficient. Accordingly, in a past descriptive study conducted with first-year and last-year students of Faculty of Medicine, Medical Technology Vocational Training School (MTVTS), and Faculty of Dentistry in Turkey, students' insufficient knowledge about HIV/AIDS was reported to result in neglecting the threat the infection and the disease pose to our country and our world [5].

Accordingly, based on our findings concerning healthcare professionals employed in a tertiary healthcare center, professionals working in the operating room seem to differ substantially from participants working in laboratory and in-patient clinic units of hospital in terms of higher knowledge scores, higher percentage of past education, lesser disturbance they would feel if they work with an individual with AIDS in the same unit and reasonable evaluation of the importance given to HIV/AIDS in our country and in the world.

Knowledge, attitude and behaviour of the students of HCWs about infectious diseases like HIV/AIDS have been considered crucial as they will take care of HIV/AIDS patients in the future [5]. Our findings revealed past education concerning HIV/AIDS to be confirmed by significantly higher number of participants working operating room than in laboratory and in-patient clinic, while the main source of information was identified to be conference and congress more than half of participants in each group.

Additionally, while based on subjective self-assessment, inadequacy of the extent of lectures on HIV/AIDS identified by majority of our HCWs is in line with the results of a past study concerning attitudes toward universal precautions about HIV/AIDS and exposure of healthcare workers to body fluids in Ethiopia, which reported that only 54% of HCWs perceived themselves to have adequate knowledge of universal precautions and 95.5% of HCWs wished to learn more about the subject [3]. Likewise, in a past study concerning of knowledge and attitudes of nurses and physicians in Turkey, subjects indicated that their level of knowledge was insufficient, with rates of 78.6% and 61.3% respectively [15].

Therefore, albeit not significant, tendency toward higher values in the percentage of participants indicating faculty lectures as the source of information as well as that of identifying the extent of lectures on HIV/AIDS to be adequate among healthcare professionals working in operating room is worth noting.

In this context, since there was no significant difference in exposure to risk identified by participants with respect to hospital unit and conferences/congresses were identified as the main source of information concerning HIV/AIDS by most of participants regardless of the hospital unit, it seems reasonable to consider that the past education, faculty lectures in particular, to have a significant impact on knowledge level about, attitude toward and emphasis given to HIV/AIDS among healthcare professionals.

Besides, a positive correlation of attitude to knowledge theoretical change models suggest that attitude change occurs slowly over time since the process of attitude change requires that the individual objectively examine critical elements of the attitude and identify those components that are valid and those that are prejudgments [11,16]. Likewise, the role of peer educators in comparison to professionals in modifying knowledge and attitude towards PHA has been reported and both similarity and expertise recommended to be combined in education [8]. Furthermore, both pregraduate and postgraduate education at medicine and dentistry faculties and nursing schools has been suggested to be re-evaluated and improved not only in quantity, but also in quality since a positive change in attitude and behaviour was likely as the knowledge increases [5].

Conclusion

Our findings indicate moderate level of knowledge on HIV/AIDS and positive attitudes toward a patient with HIV/AIDS among healthcare professionals employed in a tertiary healthcare center in Turkey with superiority of operating room staff in terms of knowledge level and past education about as well as positive attitudes and more realistic approach toward PHA. Nonetheless, differences in attitudes toward a friend/collague or patient with HIV/AIDS among our HCWs seem to indicate the controversy on response to actual or presumed lifestyles of PHA and response to the infection of the disease. Based on the fact that the attitudes of health care providers are a key dimension of successful prevention efforts concerning HIV and considerable barrier to the provision of treatment and care for patients with HIV/AIDS as a result of stigma within health care settings [17-19], and the link between high level of knowledge and positive attitudes towards HIV/AIDS, a need for effective strategies to improve education programmes with complete knowledge of HIV/AIDS and encouragement of positive attitudes and behaviours towards HIV/AIDS seem mandatory.

Conflict of Interest

The authors declare they have no conflict of interest.

References

1. Pickles D, King L, Belan I. Undergraduate nursing student's attitudes towards caring for people with HIV/AIDS. Nurse Educ Today. 2012;32(1):15-20
2. Useh U, Akinpelu AO, Makinde GB. HIV/AIDS Pandemic: Comparative knowledge and roles of physiotherapists in two African countries. Physiotherapy 2003;89(12):720-7.
3. Reda AA, Vandeweerd JM, Syre TR, Egata G. HIV/AIDS and exposure of healthcare workers to body fluids in Ethiopia: attitudes toward universal precautions. J Hosp Infect 2009;71(2):163-9.
4. Bell DM. Occupational risk of human immunodeficiency virus infection in healthcare workers: an overview. Am J Med 1997;102:9–15.
5. Turhan O, Senol Y, Baykul T, Saba R, Yalçin AN. Knowledge, attitudes and behaviour of students from a medicine faculty, dentistry faculty, and medical technology Vocational Training School toward HIV/AIDS. Int J Occup Med Environ Health 2010;23(2):153-60.
6. Paxton S, Gonzales G, Uppakaew K, Abraham KK, Okta S, Green C et al. AIDS-related discrimination in Asia. AIDS Care 2005;17(4):413-24.
7. Foreman M, Lyra P, Breinbauer C. Understanding and responding to HIV/AIDS related stigma and discrimination in the health sector. Pan American Health Organization, 2003.
8. Yiu JW, Mak WW, Ho WS, Chui YY. Effectiveness of a knowledge-contact program in improving nursing students' attitudes and emotional competence in serving people living with HIV/AIDS. Soc Sci Med 2010;71(1):38-44.

9. Van Servellen G, Lewis CE, Leake B. The limitations of generic AIDS educational programs for the health professions. J Contin Educ Health Prof 1990;10:223–36
10. Petroll AE, Hare CB, Pinkerton SD. The essentials of HIV: A review for nurses. J Infus Nurs 2008;31:228-35.
11. Mockiene V, Suominen T, Valimaki M, Razbadauskas A, Martinkenas A, Caplinskas S. The impact of an education intervention to change nurses' HIV-related knowledge and attitudes in Lithuania: a randomized controlled trial. J Assoc Nurses AIDS Care. 2011;22(2):140-9.
12. Ay P, Karabey S. Is there a "hidden HIV/AIDS epidemic" in Turkey?: The gap between the numbers and the facts. Marmara Med J 2006;19:90-7.
13. Pettigrew TF, Tropp LR. How does intergroup contact reduce prejudice? Meta-analytictestsofthreemediators. Eur J Socl Psychol 2008;38:922-34.
14. Heijnders M, VanderMeij S. The fight against stigma: an overview of stigma-reduction strategies and interventions. Psychol Health Med 2006;11:353-63.
15. Zencir M. Nurses and physicians' evaluation of knowledge and attitudes about AIDS in Pamukkale University Faculty of Medicine. HIV/AIDS 1998;1(4):159–64.
16. Williams AB, Wang H, Burgess J, Wu C, Gong Y, Li Y. Effectiveness of an HIV/AIDS educational programme for Chinese nurses. J Adv Nursing 2006;53:710-20.
17. Chan KY, Stoové MA, Sringernyuang L, Reidpath DD. Stigmatization of AIDS patients: disentangling Thai nursing students' attitudes towards HIV/AIDS, drug use, and commercial sex. AIDS Behav 2008;12(1):146–57.
18. Webber GC. Chinese health care providers' attitudes about HIV: a review. AIDS Care 2007;19(5):685–91.
19. Chan KY, Yang Y, Li ZR, Stoové MA, Reidpath DD. Interrelationships between HIV/AIDS and risk behavior prejudice among medical students in Southern China. Curr HIV Res 2009;7(6):601–11.