

Knowledge and attitudes of paramedical students in Saudi Arabia toward HIV/AIDS

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ABSTRACT

Objectives: The present study aimed to build a baseline profile for knowledge and attitudes of Saudi paramedical students toward human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS).

Methods: The study was a cross-sectional one conducted on a sample selected from health institutes and colleges in Saudi Arabia during the calendar year 2002/2003.

Results: A high percentage of students correctly perceive the risk presented by HIV/AIDS. Extramarital sex and unprotected sex were the most frequently mentioned risky behaviors. Misconceptions and lack of knowledge regarding transmission of HIV/AIDS were reported. Lack of knowledge on the means of individual protection, means of protection of infants of HIV/AIDS-infected mothers and means of protection of HIV/AIDS-infected individual's wife was observed. While friends were the

main source of information among male students, booklets were the main source of information among females. More than two-thirds of students were willing to be tested for HIV. We observed negative attitudes toward discussing AIDS topics with others, home-care for HIV/AIDS individuals and HIV/AIDS-infected individual's right at work.

Conclusion: We found lack of knowledge regarding HIV/AIDS transmission and means for prevention in addition to unfavorable attitudes towards HIV/AIDS individuals. We recommend an evaluation of HIV/AIDS information in the curricula of health institutes and health colleges in addition to conduction of a nationwide health education campaign on HIV/AIDS.

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Human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) is now the fourth leading cause of death worldwide, and the single leading cause of death in sub-Saharan Africa.¹ In the Eastern Mediterranean region and North Africa the global HIV/AIDS epidemic is not borne out by the latest estimates, which indicate that 55,000 people acquired HIV infection in the year 2003, bringing the total number of people living with HIV/AIDS to 600,000.²

Since an accessible, affordable and complete cure for HIV/AIDS and an effective vaccine to prevent HIV infection may not be available in the near future, primary prevention to control the spread of HIV

infection through awareness and changing behavior remains at the highest priority for HIV/AIDS control program.³

The present work aimed to build a baseline profile for knowledge and attitudes of Saudi paramedical students about HIV/AIDS.

Methods. The present study was a cross-sectional one conducted on a sample selected from health institutes and colleges in Saudi Arabia during the calendar year 2002/2003. Students of health colleges and health institutes were selected due to their young ages and good candidates for

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health education. In addition, these establishments are ministry of health institutes where good cooperation is ensured.

The study sample was selected by multistage cluster sampling technique. The institutes and colleges (N=37) were divided according to geographical parts of the Kingdom into 5 clusters; East, West, North, South and Central. Health institutes and colleges located in each region were listed and one was chosen randomly, except for the Western region (the biggest region) where 2 establishments were chosen. The selected establishments included Riyadh Health College for boys, Jeddah Health College for boys, Dammam Health College for girls, Al-Madeenah Al-Monawwarh Health Institute for boys, Al-Jouf Health Institute for girls and Jazan Health Institute for girls. The first and second year students of these establishments were chosen to represent the target sample of the study.

A pre-designed anonymous questionnaire was prepared in Arabic language to collect the required data. Before filling the questionnaire, the purpose of the study was explained and instructions for answering the questionnaire were elaborated.

The questionnaire included data related to personal information, risky behaviors, symptoms related to HIV/AIDS, modes of transmission, means of protection and attitudes toward some issues related to HIV/AIDS in addition to sources of HIV/AIDS information.

After completion of data collection, it was reviewed, organized, tabulated and statistically analyzed using the EPI Info statistical computer package, version 6.04. Questions that were not answered and those with irrelevant answers were omitted in tabulation and analysis. The statistical significance level was set at 0.05.

Results. The study included (653) students, 400 (61.3%) were males and 253 (38.7%) were females. The mean age was 21.13 ± 2.1 years. Those of institutes represented 45.9% while those of colleges represented 54.1%. Out of included students, only 6% were married and 87% mentioned HIV/AIDS as the most dangerous disease known to them.

Table 1 shows number and percentage distribution of students according to their knowledge about risky behaviors that expose individuals to HIV infection by gender. Unprotected sex ranked first among males followed by extramarital sex. While among females, extramarital sex represented 56.7% and unprotected sex represented 29.8%. Sex differences were found to be statistically significant, ($\chi^2_3=25.5, p=0.000$).

Table 2 shows number and percentage distribution of students according to their knowledge on the modes of HIV transmission by gender. Out of males

included, 18.6% had incorrect knowledge regarding transmission by insects and 33% did not know if HIV could be transmitted by insect compared with 20.2% had incorrect knowledge on transmission by insect and 36.3% who did not know among females. Sex differences were found to be statistically not significant ($\chi^2_2=1.49, p=0.474$).

Among males, 7.1% mentioned that HIV could be transmitted by food compared with 13% among females and 16.1% among males did not know if HIV could be transmitted by food compared with 21% among females. These differences were found to be statistically significant ($\chi^2_2=10.4, p=0.006$)

It was found that 14.4% of males and 17.8% of

Table 1 - Number and percentage distribution of students according to their knowledge regarding risky behaviors exposing an individual to HIV infection by gender.

Variable	Gender			
	Male N=381		Female N=238	
	n	(%)	n	(%)
Extramarital sex	161	(42.3)	135	(56.7)
Unprotected sex	187	(49.1)	71	(29.8)
Injections and transfusion	18	(4.7)	12	(5.1)
Don't know	15	(3.9)	20	(8.4)

$\chi^2_3 = 25.5, p=0.000$.
Students chose only one answer for the risky behavior exposing individuals to HIV infection.

Table 2 - Number and percentage distribution of students according to their knowledge on the modes of HIV transmission by gender.

Mode of transmission	No		Yes		Don't know	χ^2_2	p
	n	(%)	n	(%)			
Insect bites							
Male (n = 397)	192	(48.4)	74	(18.6)	131 (33)	1.49	0.474
Female (n= 253)	110	(43.5)	51	(20.2)	92 (36.3)		
Food							
Male (n = 397)	305	(76.8)	28	(7.1)	64 (16.1)	10.4	0.006
Female (n = 253)	167	(66)	33	(13)	53 (21)		
Shaving tools							
Male (n= 397)	57	(14.4)	281	(70.8)	59 (14.8)	2.9	0.235
Female (n = 253)	45	(17.8)	163	(64.4)	45 (17.8)		
Tooth brush							
Male (n = 396)	74	(18.7)	238	(60.1)	84 (21.2)	1.8	0.407
Female (n = 253)	49	(19.4)	140	(55.3)	64 (25.3)		
Breast feeding							
Male (n = 353)	81	(22.9)	88	(24.9)	184 (52.2)	7.4	0.025
Female (n = 192)	38	(19.8)	69	(35.9)	85 (44.3)		
During pregnancy							
Male (n= 396)	10	(2.5)	352	(88.9)	34 (8.6)	25.2	0
Female (n= 253)	4	(1.6)	192	(75.9)	57 (22.5)		

females did not consider shared shaving tools as a mean of HIV transmission. While those who did not know if HIV could be transmitted by shared shaving tools represented 14.8% among males and 17.8% females. Sex differences were found to be statistically not significant ($\chi^2=2.9, p=0.235$).

Regarding transmission by shared tooth brushes, 18.7% of males did not believe that HIV could be transmitted by shared tooth brushes and 21.2% didn't know. These figures have to be compared with 19.4% and 25.3% among females without statistically significant sex difference ($\chi^2=1.8, p=0.407$).

Students who had incorrect knowledge regarding HIV transmission by breast feeding represented 22.9% of males and 19.8% of female. On the other hand, those who did not have knowledge represented 52.2% of males and 44.3% of females. This difference was found to be statistically significant ($\chi^2=7.4, p=0.025$).

Regarding students knowledge about transmission during pregnancy and delivery, a statistical significant sex difference was found, where 8.6% of males did not know if HIV could be transmitted during pregnancy compared to 22.5% among females ($\chi^2=25.2, p=0.000$).

Table 3 shows number and percentage distribution of students according to their knowledge on the

means of protection from HIV infection by gender. Avoidance of unsafe blood transfusion ranked first as a mean of individual protection among both males and females followed by avoidance of unsafe injections then restricted sex to legal partners. Condom was mentioned by only 5.3% of males and 2% of females. These gender differences were found to be statistically not significant ($\chi^2=5.9, p=0.434$).

Regarding means of protection of infants of HIV-infected mothers, 34.9% of males mentioned that there is no mean and 55.8% did not know if there is a mean for this purpose compared with 22.4% and 57.8% among females. Delivery by elective section was mentioned by 3.4% of males and 10.4% of females while avoidance of breast feeding was mentioned by only 3.1% of males and 6.3% of females. Regarding the use of drugs, 2.8% of males and 3.1% of females mentioned the use of certain drugs for this purpose. Sex differences were found to be statistically significant ($\chi^2=19.8, p=0.001$).

Concerning means for protection of HIV/AIDS-infected individual's wife, use of condom was mentioned by 21% of males compared to 15.8% of females. Abstinence from sex was mentioned by 23.8% of males compared to 25.7% of females. On the other hand, 23.8% of males and

Table 3 - Number and percentage distribution of students according to their knowledge regarding means of protection from HIV infection by gender.

Means of protection	Gender			
	Male		Female	
	n	%	n	%
Individual protection	N=395		N=253	
Avoidance of unsafe blood transfusion	138	(35)	91	(36)
Avoidance of unsafe injections	110	(27.8)	73	(28.8)
Restricted legal sex	63	(16)	35	(13.8)
Use of condoms	21	(5.3)	5	(2)
Sex abstinence	5	(1.3)	4	(1.6)
No mean	10	(2.5)	8	(3.2)
Don't know	48	(12.1)	37	(14.6)
	$\chi^2_6 = 5.9, p=0.434$			
Protection of infants of HIV/AIDS-infected mothers	N=353		N=192	
Drugs	10	(2.8)	6	(3.1)
No breast-feeding	11	(3.1)	12	(6.3)
Delivery by cesarean section	12	(3.4)	20	(10.4)
No mean	123	(34.9)	43	(22.4)
Don't know	197	(55.8)	111	(57.8)
	$\chi^2_4 = 19.8, p=0.001$			
Protection of HIV/AIDS-infected individual's wife	N=395		N=253	
Use of condoms	83	(21)	40	(15.8)
Abstinence from sex	94	(23.8)	65	(25.7)
No mean	94	(23.8)	29	(11.5)
Drugs	19	(4.8)	36	(14.2)
Don't know	105	(26.6)	83	(32.8)
	$\chi^2_4 = 32.9, p=0.000$			

11.5% of females considered that there is no mean for this purpose. Those who didn't know represented 26.6% among males compared to 32.8% among females. Sex differences were found to be statistically significant ($\chi^2=32.9, p=0.000$).

Table 4 shows number and percentage distribution of students according to their sources for HIV/AIDS information by gender. Among males, friends ranked first as a source of HIV/AIDS information followed by family members and booklets. While among females, booklets ranked first as a source of HIV/AIDS information followed by friends then family members. Health workers were the source of information in 14% among males and 11.5% among females. These differences were found to be statistically significant ($\chi^2=40.15, p=0.000$).

Table 5 shows number and percentage distribution of students according to their attitudes towards some issues related to HIV/AIDS by gender. More than

60% of students were willing to be tested for HIV/AIDS, without any significant statistical difference in relation to gender ($\chi^2=0.63, p=0.487$). Among males, 27.3% accepted to discuss HIV/AIDS topics with others compared with 17% among females. Sex differences were found to be statistically significant ($\chi^2=8.67, p=0.003$).

The percentage of students who accepted home care for HIV/AIDS-infected individual was low and sex differences were found to be statistically not significant ($\chi^2=0.42, p=0.517$).

Most students preferred confidentiality of HIV/AIDS family member's serostatus, as 60.6% of males preferred confidentiality compared to 44.7% among females. The difference was found to be statistically significant ($\chi^2=15.04, p=0.000$).

Regarding acceptance of HIV/AIDS-infected individual's right at work, the percentage of students who accepted this issue was low among both males (19.1%) and females (18.2%) with no statistically significant difference ($\chi^2=0.04, p=0.481$).

Table 4 - Number and percentage distribution of students according to their sources for HIV/AIDS information by gender.

Source of information	Gender			
	Male N=392		Female N=243	
	n	(%)	n	(%)
Friends	142	(36.2)	(45)	(18.5)
Family member	74	(18.9)	(43)	(17.7)
Booklets	73	(18.6)	(83)	(34.2)
Health worker	55	(14.0)	(28)	(11.5)
Newspapers	25	(6.4)	(14)	(5.8)
Satellite channels	9	(2.3)	(12)	(4.9)
Workshops	6	(1.5)	(7)	(2.9)
Local TV channels	5	(1.3)	(9)	(3.7)
Posters	3	(0.8)	(2)	(0.8)

$\chi^2 = 40.15, p=0.000$

Discussion. A significant number of factors have contributed to the spread of HIV/AIDS, not only poverty, illiteracy and status of women but also denial and increase in mobility and industrialization. Even in countries where HIV infection has a low rate, early actions are essential to avoid serious impacts on economic activities.⁴ Several studies have examined the AIDS knowledge level of adolescents and adults and found different levels of knowledge about AIDS regarding causes and modes of transmission and means of prevention across cultures.⁵⁻⁹

The present study revealed that most of the included students had perceived the high risk presented by HIV/AIDS correctly as 87% mentioned HIV/AIDS as the most dangerous infectious disease known to them. Previous

Table 5 - Number and percentage distribution of students according to their attitudes towards some issues HIV/acquired immune deficiency syndrome (AIDS) by gender.

Variable	Gender				χ^2	P
	Male		Female			
	No n (%)	Yes n (%)	No n (%)	Yes n (%)		
Willingness to be tested for HIV	136 (34.7)	256 (65.3)	232 (36)	412 (64)	0.63	0.427
Acceptance to discuss AIDS topics with others	287 (72.7)	108 (27.3)	210 (83)	43 (17)	8.67	0.003
Acceptance of home care for HIV/AIDS-infected individual	340 (85.6)	57 (14.4)	222 (87.7)	31 (12.3)	0.42	0.517
Confidentiality of a family member's HIV/AIDS infection	155 (39.4)	238 (60.6)	140 (55.3)	113 (44.7)	15.04	0.000
Acceptance of HIV/AIDS-infected individual's right at work	321 (80.9)	76 (19.1)	207 (81.8)	46 (18.2)	0.04	0.481

literature on health behaviors has focused on the role of individual's perceived susceptibility to AIDS as a motivator for behavioral changes. Individuals must perceive themselves to be at risk of health threat before they will take an action to reduce risky behaviors or to engage in healthy alternative behaviors¹⁰ and those who report high perceived risk for AIDS were found to practice safer sexual behaviors, whereas those perceived low risk practicing unsafe sexual behaviors.¹¹

Although the predominant means of HIV transmission nowadays are heterosexuality¹² and injecting drugs¹³ it is still common to have transfusion-related HIV infection in general population.¹⁴ Extramarital sex and unprotected sexual practices were the most frequently mentioned risky behaviors for HIV infection in the present study.

In a study in 4 hospitals in Tanzania, 96% of nurses had satisfactory knowledge on HIV/AIDS.¹⁵ On the other hand, a study on AIDS-related knowledge, attitudes and beliefs of qualified nurses in Scotland showed that a substantial proportion of them did not have the basic information on HIV/AIDS.¹⁶ Similarly, a study in Italy showed that health workers' perceptions of scientific knowledge on HIV/AIDS were poor with wrong behaviors and attitudes.¹⁷

In the present study misconceptions regarding modes of HIV transmission were found among both males and females. The human immunodeficiency virus could not spread unless there is a sexual contact or an exchange of blood with an infected person. It does not spread by daily and routine activities, sharing public transportation, cups or glasses, food, eating utensils, water or air, through toilets or clothes. It also could not spread by insect bites.³

Most children infected with HIV, including those with AIDS, have been infected by mother to fetus/infant transmission. Detection of HIV in fetal tissues supports the hypothesis that infection can occur in utero.¹⁸ In the absence of any intervention, rates of mother-to-child transmission of HIV can vary from 15-30% without breast-feeding and can reach 30-45% with prolonged breast-feeding and transmission can take place during pregnancy, labor or delivery and can affect infants and young children as long as breast-feeding continues.¹⁹ In the present study, approximately 20% of both males and females stated that HIV could not be transmitted from an infected mother to her infant through breastfeeding.

Latex condoms are recommended as a barrier method for reducing the risk of HIV transmission, but it is not completely effective in preventing HIV transmission partly as there is a risk that they may break and as its effectiveness depends on proper use.²⁰ Although the great proportion of students

mentioned unprotected and extramarital sex as a risky behaviors, they ranked avoidance of unsafe blood transfusion first followed by avoidance of unsafe injections as means for individual protection. Restricted legal sex and use of condom came late after. These findings indicated that the link between practicing risky behaviors and getting infection is not clear at students' minds and also indicated that the most common mode of HIV transmission - heterosexual and the most effective mean of protection - use of condom are misperceived by a big proportion of students. Meanwhile, students are not aware on the highly effective advances in prevention of disease transmission by transfusion of blood and its products through screening of blood and blood products. In a study conducted in Southeast Nigeria, knowledge on the correct modes of HIV transmission appeared to have played a role in condom use frequency and those who were reluctant in using condom were the least knowledgeable regarding HIV transmission.²¹

Most of HIV infections in women in childbearing age are transmitted sexually; hence the prevention of sexual transmission of HIV to women is by far the best strategy for preventing transmission from mother to child.²² The 2 most recent important interventions to reduce the likelihood that a woman will pass HIV to her baby are the provision of anti-retroviral drugs and avoidance of breastfeeding. Avoiding breast-feeding can cut the risk of transmission to 20-25% and the provision of antiretroviral drugs for the last 2 weeks of pregnancy and during delivery can further cut the risk of transmission to fewer than 10%, if women also avoid breastfeeding.²³ More than one-half of students did not know if there is a mean to protect an infant from being infected from his HIV/AIDS-infected mother and nearly one-third concluded that there is no mean for this purpose.

In the current study, use of condom to protect a wife of HIV/AIDS-infected husband was mentioned only by 21% of males and 15.8% of females. A finding, which may reflect the negligence of mentioning the role of condom in prevention of HIV transmission in settings of health education in the conservative communities, for fear of being a tool used to encourage the illegal sexual relations. The proportion of students considered abstinence from sex in cases where one partner is infected with HIV could reflect the degree of perception of the danger presented by HIV by the studied students.

Considering sources of information, friends ranked first among males while booklets ranked first among females. This may reflect the fact that females are more shameful, so they tend to have knowledge on sex issues through reading books rather than through open discussion with their peers. Despite widespread distribution of mass media, including newspapers, magazines and satellite

television channels, they had a negligible role in the present study, which may reflect the scarceness of health education materials projected by these media, especially on HIV/AIDS. These findings may suggest that peer-education approach among males is possible if peer-educators properly selected and motivated in addition to use of booklets and leaflets among females. In contrary, in a study in Bangladesh and another in Thailand, mass media were the main source for HIV/AIDS information followed by posters, leaflets and friends.^{13,24}

Knowledge of serostatus through screening can be a motivating force for HIV-positive and HIV-negative people alike to adopt safer sexual behavior, which can enable seropositive people to prevent their sexual partners from getting infection and those who test seronegative to remain negative.²⁵ In the present study, nearly two thirds of both males and females accepted to be tested for HIV. Discussion on gender topics, including HIV/AIDS, in conservative communities, especially Islamic ones- is considered immoral. Therefore, open discussion of these topics is not encouraged in these communities and females were more conservative in this aspect than males. Home-based care is already expanding rapidly in all countries. The expansion is due in part to increasing needs in addition to a shift from hospital-based care to community-based care for economic reasons, especially in developing countries. In all countries, families have always been the major providers for long-term care, especially for elderly and those with chronic diseases such as HIV/AIDS, tuberculosis and malaria.²⁶ In the present study, only 14.4% of males and 12.3% of females accepted home-care for HIV/AIDS patients. These findings may reflect the community phobia from HIV/AIDS and lack of knowledge regarding modes of HIV transmission. In a study in Kenya to assess community attitudes towards HIV/AIDS and home-based care it was found that inadequate information about the disease and care expectations made people ambivalent toward the sick individuals and, in some instances, out-right rejection prevailed. This formed the basis for their preference of institutional-based care and opposing home-based care which further compounded by the economic status of the family.²⁷ Confidentiality of medical information has been considered a central element of the rights of patients in many nations.²⁸ In countries all over the world, there are well-documented cases of people with HIV/AIDS being stigmatized, discriminated against and denied access to services on the grounds of their serostatus.²⁹ This may explain the preference of confidentiality and the unfavorable attitudes towards acceptance of HIV-infected individual's right at work in the present study. It

may be also attributed to the supposed risk of HIV transmission.³⁰

Based on the findings of the present study, it is recommended that the curricula of health institutes and colleges should be evaluated regarding the included information regarding HIV/AIDS and a community-based health education program has to be established.

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