

# Assessment of Knowledge, Attitude and Belief of Medical Students towards AIDS Prevention and Transmission in Mashhad, Iran

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## Abstract

**Background:** Iran is estimated to have about 73000 (50000-130000) people living with human immune deficiency virus (HIV) by end of 2015. Medical students are of special emphasis in agenda setting against Acquired Immunodeficiency Syndrome (AIDS).

**Objectives:** The aim of this study was to assess the Knowledge, attitudes and practice of medical students to HIV/AIDS.

**Methods:** This cross-sectional study was conducted among medical students in Mashhad, Iran in a six-month period at the second half of the year 2016. Stratified cluster random sampling technique was used to select 202 students in 4 courses of medical education. The world health organization's instrument was used for assessing knowledge, attitudes, and beliefs about HIV/AIDS. One way ANOVA or Kruskal wallis test were used for data analysis.

**Results:** The mean age of the subjects was 22.31±2.97 years. Most of them were male (65.7%) and 77.4% were single. Medical students had almost good general knowledge about HIV/AIDS. 28.9-98% answered correctly to this section. In transmission knowledge section there were some misconceptions about the routes of transmission and 15.6-98.5% answered correctly. The majority of students had positive attitudes toward HIV/AIDS, 74-98.2% of respondents answered correctly to this section. Overall 56-98% of students responded correctly to different beliefs domain questions. There were significant differences in mean knowledge score between four different courses of medical education (P=0.004).

**Conclusion:** Findings indicated a statistically significant betterment in some aspect in knowledge, attitude and belief toward HIV/AIDS, but it was expected that final year medical students had more correct information, a fact not indicated in this study.

*Keywords:* Attitude, Belief, HIV/AIDS, Knowledge, Medical Student

## 1. Background

Acquired immune deficiency syndrome (AIDS) is the fourth leading cause of death among diseases and the fifth leading cause of death from infectious diseases in the worlds. (1) Iran is estimated to have about 73000 (50000-130000) people living with human immune deficiency virus (HIV) by end of 2015. (2) According to the national surveillance system statistics, the main pattern of HIV transmission in Iran is shared and recycled needles in intravenous injection drug users (IVD) (57.2%) and then high risk sex behaviors (13.9%).(3) So that HIV epidemic in Iran is basically centralized among two of the key population groups. Iran is a country with concentrated HIV epidemic with infection rate remains above 5% among key populations. Managing concentrated epidemics based on scientific evidence and effective methods are important, otherwise they lead to general epidemics. (4)

Control and prevention of HIV is one of the most important agenda settings of many policymakers in Iran. Knowledge and attitude towards different routes of HIV transmission and actual practice

determine the spread of disease in any community. Before adjusting prevention policies, it is important to obtain information about knowledge, attitude and belief toward HIV, AIDS in the target community. The knowledge and attitudes of health care provider will affect the quality of care of patients and also increasing the awareness of general population and high risk groups about HIV/AIDS. (5) So assessing and promotion of knowledge, attitude and belief of health care professionals are critical points in prevention and educational programs.

## 2. Objectives

The aim of this study was to assess the Knowledge, attitudes and practice of medical students to HIV/AIDS.

## 3. Methods

### Study design

This cross-sectional study was conducted among 240 medical students in Mashhad, the second most populous city in Iran and capital of Razavi Khorasan

Province, located in the north east of Iran, in a six-month period at the second half of the year 2016. Medicine in Iran is trained over 7 academic years; the first 2.5 years are basic science, while years 2.5 to 3.5 is physiopathology, followed by 2 years of externship and 1.5 years of internship.

Stratified cluster random sampling technique was used to select medical students in 4 courses of education as follows:

Group (1): 60 medical students in basic science course

Group (2): 60 medical students in physiopathology course

Group (3): 60 medical students in externship course

Group (4): 60 medical students in internship course

From the ethical points of view, the general objectives of the study were explained for students. The questionnaires were anonymous in order to provide the confidentiality of the information. Approval for the study was obtained from the National Ethics Committee of Mashhad University of Medical Science (IRB: 940944)

#### *Instrument*

- The World Health Organization (WHO) developed a specific questionnaire to assess HIV/AIDS related knowledge, attitudes and beliefs in different populations.(6) The instrument was validated in pervious study and the Cronbach's Alfa for knowledge, attitude, and belief domains was 0.81, 0.84, and 0.69, respectively (7) This self-administered instrument comprises of 48 questions in 5 sections:
- Sociodemographic background includes age, sex, marital status, educational grade, self-reported family economic status and residence (6 items)
- Questions about knowledge toward HIV/AIDS consist of 24 items in 2 parts: general information about the disease (11 items) and information about mode of HIV/AIDS transmission (13 items)
- Questions about the respondent attitudes to HIV/AIDS (11 items)
- Questions regarding student's beliefs towards AIDS (5 items)

Each item in knowledge section was answered in three options "Agree", "Disagree" and "I don't know" and each item in attitude section and belief section was rated on a 4-point Likert scale. The frequency of students in different study groups who answered correctly to the specific item out of all the students who answered that item was calculated for each domain. Participants who did not answer a specific question were considered absent in statistics calculation. The selection of "I don't know" in knowledge domain was assumed as a wrong answer.

From the other points of view to each correct answer in knowledge domain allocated 2 points, one

point for "I don't know", and incorrect answer had zero point, so that first and second part of knowledge section were reported on a scale of 0-22 and 0-26 respectively. Each item in attitude section and belief section was rated on a 4-point Likert scale. In attitude and belief section, 1 defined negative attitude and belief and 4 defined positive attitude and belief. For negative conception items, the scores were reversed. So that higher score showed more correct attitude and belief regarding HIV/AIDS.

#### *Statistical analysis*

All the data from the questionnaire was entered into SPSS software package version 11.5. Categorical variables were demonstrated as the exact amount and percentage and the quantitative variable as the mean  $\pm$  standard deviation (SD). To compare continuous variables between four study groups either one way ANOVA and scheffe test as the Post Hoc test or Kruskal wallis test were used, after assessing the condition of normality by using Kolmogorov-Smirnov's test. Pearson's Chi-square was used to analyze categorical variables between groups. In all calculations, P value < 0.05 was considered as statistically significant level.

## **4. Results**

202 medical students in four different course of their education completed the questionnaires, so responsive rate was 84.16%. Demographic characteristics of participants were shown in [Table 1](#).

#### *Respondents' knowledge*

The analysis of data showed that in most items subjects had partly well to excellent knowledge about HIV/AIDS. In general knowledge subsection part, 28.9-98% answered questions correctly and in subsection related to transmission knowledge, 15.6-98.5% answered correctly.

Clinical students gave more correct answers to the practical questions, whereas preclinical students had more accurate answers in theoretical questions and to some extent this recent group overestimated the risks of HIV/AIDS. Although these differences did not reach statistical significance in any questions except for Q3 (Q3: AIDS is a hereditary disease) ( $p=0.001$ ) in general knowledge subsection and Q2 (Q2: AIDS can be transmitted from personal objects such as clothes, comb, underwear and towel) ( $p=0.07$ ), Q3 (Q3: ADIS can be transmitted from razors blade with an infected person) ( $p=0.03$ ), Q7 (Q7: The bite of a mosquito can transmit AIDS) ( $p<0.001$ ), Q12 (Q12: The urine, tears, mucus or nasal fluid of an infected person can transmit AIDS) ( $p=0.001$ ) and Q13 (Q13: The breast milk of an infected person can infect her newborn) ( $p=0.02$ ) in transmission knowledge subscale. Both four

groups of students had misunderstanding about breastfeeding transmission. The prevalence of this misperception was significantly higher among externship students ( $P=0.001$ ).

From the other points of view the mean of knowledge domain scores in different course of medical school were shown in table 2. In Scheffe test, there were statistical significant differences in mean transmission knowledge score between internship course and basic science course ( $p= 0.002$ ) and also physiopathology ( $P= 0.002$ ). In

total knowledge score, the difference between physiopathology and internship was statistically significant ( $P = 0.02$ ).

Overall, the students' knowledge about route of transmission of HIV was high for the majority of factors. 84.4% of respondents incorrectly believed that HIV can be transmitted through breast feeding.

#### Respondents' attitude

Overall attitudes of the medical students were shown in table 3. We assigned "strongly agree and

**Table 1.** Demographics characteristics of medical students

		basic science course N (%)	physiopathology course N (%)	externship course N (%)	internship course N (%)	Whole N (%)
<b>Gender</b>	Male	7 (12.3)	24 (64.9)	29 (50.9)	7 (15.9)	68 (65.7)
	Female	50 (87.7)	13 (35.1)	28 (49.1)	37 (84.1)	130 (34.3)
<b>Marital Status</b>	Single	54(94.7)	29 (76.3)	43 (75.4)	28 (62.2)	150 (77.4)
	Married	3 (5.3)	8 (21.1)	12 (21.1)	17 (37.8)	42 (21.1)
	Divorced/Widowed/Separated	21 (30)	1 (2.6)	2 (3.6)		3 (1.5)
<b>Lodging status</b>	Student dormitory	29 (50.9)	13 (34.2)	38 (67.9)	36 (80)	116 (58.9)
	Living with parents	25 (43.9)	21 (55.3)	9 (16.1)	7 (15.6)	63 (32)
	Others	3 (4.3)	4 (10.6)	9 (16.1)	2 (4.4)	18 (9.2)

**Table 2.** Mean (SD) scores of knowledge regarding general knowledge and transmission knowledge in different courses of medical students

	basic science course	physiopathology course	externship course	internship course	P value*
<b>General knowledge</b>	16.93 (2.18)	16.56 (2.16)	17.03 (1.64)	16.95 (1.91)	0.56
<b>Transmission knowledge</b>	20.75 (1.87)	20.46 (1.87)	21.98 (2.02)	22.50 (1.33)	<0.001
<b>Total knowledge</b>	37.68 (3.19)	37.03 (5.01)	39.01 (2.36)	39.45 (2.63)	0.004

\*Pvalue was calculated based on Kruskal wallis test.

**Table 3.** Frequency and percentage of correct responses to HIV/AIDS Attitudes' questions

Attitude domain	basic science course N (%)	physiopathology course N (%)	externship course N (%)	internship course N (%)	P value*
Q1: HIV positive students should go to a separate school (n=200)	41 (71.9)	34 (91.9)	51 (89.5)	38 (82.6)	0.03
Q2: If there is a student with AIDS in a school I would withdraw my child from that school (n=200)	47 (82.5)	31 (83.8)	50 (87.7)	40 (87)	0.8
Q3: I would not sit in the same armchair or desk with a person with AIDS (n=199)	51 (89.5)	36 (97.3)	56 (100)	45 (97.8)	0.02
Q4: They should be located or isolated in special center (n=200)	53 (93)	35 (94.6)	55 (96.5)	45 (97.8)	0.6
Q5: HIV positive individuals should be supported, treated and helped (n=198)	55 (100)	34 (91.9)	56 (98.2)	46 (100)	0.03
Q6: HIV positive individuals should have social rights like everybody else (n=200)	54 (94.7)	34 (91.9)	56 (98.2)	46 (100)	0.17
Q7: We should let HIV positive individuals to use public toilets & pools (n=195)	35 (63.6)	31 (83.8)	48 (85.7)	28 (63.6)	0.01
Q8: Not being a religious or moral person is considered as one of the reasons for getting infected (n=197)	39 (68.4)	30 (81.1)	42 (76.4)	36 (80)	0.44
Q9:AIDS is a public health problem and lay people should be informed about it (n=199)	57 (100)	34 (94.4)	56 (98.2)	46 (100)	0.13
Q10: People with AIDS should inform others about their disease (n=200)	56 (98.2)	36 (97.3)	51 (89.5)	44 (95.7)	0.15
Q11: Mass media should inform the society about this disease (n=200)	57 (100)	35 (94.6)	56 (98.2)	46 (100)	0.14

\*Pvalue was calculated based on chi-square test.

**Table 4.** Frequency and percentage of correct responses to HIV/AIDS Belief<sup>r</sup> questions

Belief domain	basic science course N (%)	physiopathology course N (%)	externship course N (%)	internship course N (%)	P value*
Q1: AIDS is a punishment from God (n=199)	55 (98.2)	35 (94.6)	53 (93)	46 (100)	0.20
Q2: AIDS is not widespread in Iran (n=198)	54 (96.4)	32 (86.5)	54 (94.7)	42 (93.3)	0.28
Q3: I will not be infected even if I live with HIV positive persons (n=194)	21 (40.4)	18 (48.6)	37 (64.9)	31 (68.9)	0.01
Q4: Marriage is the only preventive method from AIDS (n=200)	55 (30.2)	32 (17.6)	50 (27.5)	45 (24.7)	0.07
Q5: You cannot be infected with HIV/AIDS if you engage in sport and are well nourished (n=200)	57 (100)	35 (94.6)	56 (98.2)	45 (97.8)	0.34

\*Pvalue was calculated based on chi-square test.

agree" as "agree" and "strongly disagree and disagree" as "disagree". Accordingly 74-98.2% of respondents answered correctly to each question. The majority of students had positive attitudes toward HIV/AIDS, but near 26% of students believed that people with HIV/AIDS should not use public swimming pools and 24.2% did not recognize immoral lives as an important reason of receiving disease.

From the other points of view, attitude domain scale contains 11 questions in 4 likert scale and ranged from 11 to 44 points. The mean (SD) respondent score in attitude domain in different course of medical students were as follows: basic science course: 37.28 (3.28), physiopathology course: 36.63 (4.70), externship course: 37.22 (2.99) and internship course: 37.16 (3.36). There were no statistically significant differences between students score in different courses of medical school with regard to their mean score of attitude domain.

#### Respondents' belief

The data relating to respondents' beliefs were listed in Table 4. Overall 56-98% of students responded correctly to different beliefs domain questions. There were no significant differences between either four groups of study population with regard to their beliefs towards HIV/AIDS except for question number three (p=0.01). In general 44% of students had misconception about this question and thought they would be infected if they live with HIV/AIDS patients.

## 5. Discussion

The Knowledge and attitudes of medical students in various phases of their education are investigated in this study. To our information, this study is novel as no previous study has been done in Iran to assess the knowledge and attitudes of medical students towards HIV/AIDS.

In general, the study revealed acceptable knowledge about HIV/AIDS among students. Although the results of the study indicated important misconception in knowledge of HIV/AIDS in main

areas. 34.3% of participants considered AIDS as a curable disease and 71.1% regarded this disease as a problem mostly in developing or undeveloped countries and in countries with weak healthcare system. It was surprisingly to know that 12.9% of students did not know AIDS does not have a vaccine and 34.3% did not know it is a contagious disease.

While it is hopeful to consider that most of the students were aware of the common modes of HIV transmission, but there were also misunderstanding in some areas where breastfeeding of an infected mother (15.6%) and mosquito bite (19.4%) would transmit HIV. 72% of participants regarded the urine, tears, mucus and secretion of an infected person as being free of risk from virus transmission. But this knowledge had improved significantly throughout educational years and as we expected, the medical students in internship course had better knowledge in different modes of transmission of HIV/AIDS.

In other literatures even though there may be certain aspect of strength, there were substantial lacunae of HIV/AIDS knowledge in: general populations (8), medical students (9,10), and healthcare workers (11-15). Comparing knowledge levels between different studies has some limitations because of different questionnaire scales and designs and different study populations. Regarding these limitations, some comparisons were indicated as follows. Platten et al indicated that 36% of final-year medical students had misconception about maternal-infant transmission and similar to our study, 18% of students struggled with HIV vaccine. (16) Another study which conducted in Malaysia, compared HIV knowledge level between final-year medical students and pharmacy students demonstrated that even though there were lacunae in some aspect in HIV knowledge of medical students but this group had higher level of HIV knowledge compared with pharmacy students. (12) Preclinical medical students in Israel also reported similar misperception about HIV transmission via breastfeeding (only 36.6% answered correctly to this question). (17) In another study among Korean dentists, only 28% of students indicated breast feeding as one of the routs of HIV transmission. (18) In a study conducted in India,

86.8% of first year medical students knew HIV cannot transmit by mosquitoes bite. (19) Similar results were also demonstrated in a study conducted in Zagreb, Croatia on fourth year medical students. (10)

The outcomes of the study in attitude and belief domains revealed relatively positive and favorable attitude and belief toward HIV/AIDS among medical students. It is of interest and perhaps to some extent alarming, that some misperceptions were existed. 26% of students believed that HIV positive individuals should not use public tools and toilets. 75.8% of the students believed that AIDS was a consequence of deviation from the moral life. Baytner-Zamir et al assessed medical students' attitudes towards HIV/AIDS and demonstrated 18% of students believed that infected patients should be prohibited from having sexual relationship and 25% thought doctors had the right to refuse to visit HIV infected patients. (17) Other studies carried out among medical students in England and Croatia indicated the same finding. (20,21) The other studies indicated the following feeling of fear and accompanying emotion toward HIV infected patients in other health care professions as doctors, dentists and nurses. (22-30) Even though these two questions were not directly asked to the medical students in this study but all above mentioned evidence are alarming and show stigmatization attitude among medical students in different countries. Such attitude can affect quality of health care which HIV/AIDS patients should be received.

The major limitation of the study was self-administrated questionnaire. In this type of questionnaire, respondents may provide answers according to the most accurate fact determined by the researchers not necessarily in accordance with their own opinion. Additionally this study compared different generations of medical students, so this comparison cannot represent the success of education in medical schools. For this purpose, it is better to evaluate the same population of medical students at the beginning and at the end of their education.

## 6. Conclusion

Based on the results presented, it could be deduced that university medical education on HIV/AIDS, at least in Mashhad, must be considerably improved and should include strategies to increase knowledge and perception of HIV basic sciences, HIV prevention and HIV care and treatment. Although findings indicated a statistically significant betterment of some aspect of knowledge, attitude and belief toward HIV/AIDS, but one would expect more correct information of final year students to reach close to 100%, a fact not indicated in this study. This is worrying since externship and internship medical students in Iran start their clinical rotation

and they are confronted to patients.

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