

# A Population-based Study into Knowledge, Attitudes and Beliefs (KAB) about HIV/AIDS

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## Abstract

**Background:** It has been reported that three factors may be responsible for the social stigma associated with disease: widespread ignorance, little information and misconceptions about the disease in society.

**Objectives:** This study is aimed to assess knowledge, attitudes, and beliefs about HIV/AIDS in residents of Mashhad, the largest city in northeast Iran.

**Patients and Methods:** A cross sectional study was conducted over three days, starting on December 1 2013, since this day was the World's AIDS day. Each day the investigating group carried out the study in a different crowded place in the city. Using a convenience sampling method, members of the public were asked to fill in a questionnaire, which included the world health organization's instrument for assessing knowledge, attitudes, and beliefs about HIV/AIDS. The data obtained were evaluated by frequency and percentage ratios, Chi-square ( $\chi^2$ ), Mann-Whitney and Kruskal-Wallis tests, using the significance level  $P < 0.05$ .

**Results:** Three hundred and eighty five individuals participated in this study. The median age was 27 years and the interquartile range was 21 - 45 years. The data analysis showed that most participants had good knowledge in this general domain: 70.2% of the answers in this domain were correct (47.1% in males and 23.1% in females). In general, the respondents' attitudes toward AIDS were found to be tolerable and the total score showed significant differences according to educational level ( $P < 0.001$ ). The majority of the respondents indicated that television, newspapers, magazines, and books were their major sources of information about AIDS. Approximately 80% of participants needed specific information about the disease, with the prevention methods being the most frequently requested information.

**Conclusions:** This study showed that we must put more effort in translating knowledge into behavior.

**Keywords:** Knowledge, Attitudes, Beliefs, HIV/AIDS

## 1. Background

Acquired immunodeficiency syndrome (AIDS), caused by human immunodeficiency virus (HIV), and has emerged as one of the most serious health issues around the world in recent decades. worldwide, in 2012, nearly 35.3 million people were living with HIV and more than 20 million of these were women and children (1). In the same year, there were almost 2.5 million newly infected individuals globally and more than 1.5 million died from the disease (1). In the Middle East and North Africa, there were more than 260,000 new HIV positive cases in 2012. Iran, with a population of 76.5 million, is considered to be a country with a very low HIV prevalence. However, the United Nations program on HIV/AIDS (UNAIDS) reported that there was an increasing trend in the estimated number of Iranians with HIV (1). Similarly, reports published by the Iran ministry of health and medical education, show an increase in the prevalence and incidence of HIV/AIDS

and UNAIDS and WHO epidemiological model estimated that approximately 80,000 HIV positive individuals lived in Iran in 2013 (2).

Complex interactions among several factors lead to the infection by and the spread of HIV. This complexity makes control and prevention difficult. Therefore, it is vital to understand the nature of the epidemic in various locations and consider the effect of social, economic, cultural and behavioral risks (3). In other words, although the mode of transmission is known and easily preventable, the lack of knowledge and prevention practices in the general population encourage the rapid spread of the disease. Previous studies based on high-risk populations have shown that intravenous drug abuse and extramarital sexual relations are the main causes of HIV infections in Iran (4). In a study that focused on high school students in Iran, a great misconception among the respondents was observed: only 53% of the informants were aware that condoms should be used for protection against sexually transmitted infections (4).

It has been reported that three factors may be responsible for social stigma: widespread ignorance, lack of information, and misconceptions about the disease in the society (5). As such, a better understanding of the knowledge, attitudes and beliefs of the general population will help us in planning strategies for the prevention and treatment (5).

Even though different studies about attitudes regarding HIV have been previously carried out in Iran and it has been stated that an important factor fuelling the spread of HIV/AIDS is lack of awareness about how the disease is spread, it was concluded that increasing the knowledge of the citizens about the HIV/AIDS can be a powerful means of fostering positive attitudes (4, 6, 7). The increased prevalence of HIV/AIDS in this region means that more accurate and recent information about the knowledge, attitude and belief (KAB) of the population is needed.

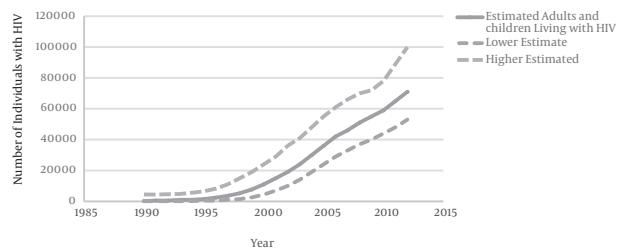
## 2. Objectives

This is the first cross-sectional study conducted by faculty members of Mashhad University of Medical Sciences and students to assess the knowledge, attitudes, and beliefs about the HIV/AIDS of the residents of Mashhad, Iran.

## 3. Patients and Methods

This cross-sectional study was conducted over three days, starting on December 1 2013, which was the world's AIDS day. The first step was to mark the most crowded parts of the city on the map; after receiving permission from Mashhad Municipality to carry out the study, three areas were selected based on this population density map. Each day a group of investigators carried out a survey of the general public in these crowded areas. Participants were chosen at random, with no age limit or limit to the number of the volunteers (candidates).

The questionnaire used in this study was the world health organization's instrument to assess knowledge, attitudes and practices relating to HIV/AIDS; this instrument had been previously used in several other studies (6-9). The Cronbach's Alfa for knowledge, attitude, and belief domains was 0.81, 0.84, and 0.69, respectively. Each person was interviewed and the researcher filled out three sections of the questionnaire: 1, socio-demographic characteristics, which included gender, marital status, education, job and monthly family income; 2, HIV/AIDS knowledge, attitudes and beliefs; 3, sources of information and the information they need. Before each interview, the individual gave oral informed consent to participate in the study. After completing each questionnaire, an educationally designed pamphlet was given to the participants (Figure 1).



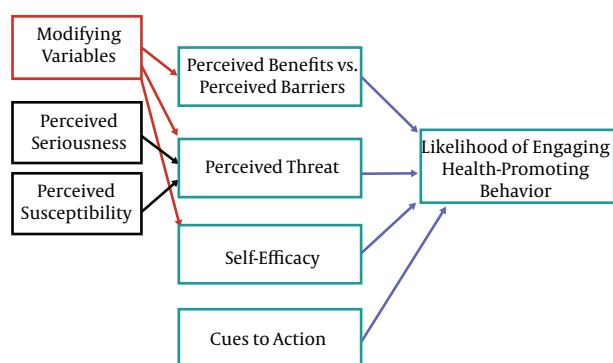
**Figure 1.** Trend of Mean Estimated (Plus Lower and Higher Estimates) Number of Iranian Citizens With HIV from 1990 - 2012 (Based on UNAIDS Database) (1)

In this questionnaire, the knowledge component comprised 11 items on the HIV agent, methods of prevention and availability of treatment for it, and 13 other questions specifically covering modes of transmission. Choices for these questions were true or false and I do not know. The maximum score for this part of the questionnaire was 24 and the minimum was zero. The attitudes component was composed based on the health belief model, a psychological model that attempts to explain and predict health behaviors by focusing on the attitudes and beliefs of individuals (10) (Figure 2) and comprised 11 items on perceived susceptibility, perceived severity, perceived barriers and perceived benefits of preventive measures against HIV, as well as personal compliance (self-efficacy). This part also included statements on the attitudes of respondents towards people living with HIV. A total score for this part was calculated as the sum of all the items with positive or negative directionality. The beliefs component comprised five items on high-risk activities and predispositions, as well as preventative practices. Every interviewee was asked to select the best suited answer for each question from a Likert scale or true or false options. They could choose from multiple choices in the part for source of information which consisted of two questions: What channel did you obtain your information on HIV/AIDS from and what additional information do you need? Participation in this study was completely voluntary and the study was approved by the community medicine department ethical committee. Statistical package for the social sciences (SPSS) version 11.5 was used to collate and analyses the data. The data obtained were evaluated by frequency and percentage ratios, Chi-square ( $\chi^2$ ), Mann-Whitney and Kruskal-Wallis tests, using the significance level  $P < 0.05$ .

## 4. Results

### 4.1. Sample Characteristics

Four hundred and five individuals were approached to participate in this study. Three hundred and eighty five



**Figure 2.** The Health Belief Model

individuals were participated and twenty refused to participate. Most of them were elderly persons who thought that is a time consuming work for them. The median age was 27 years, with an interquartile range of 21 - 45 years. From among them, 263 participants (68.3%) were male and 122 (31.7%) were female (Table 1); 200 (51.9%) were single, 179 (46.5%) were married and 6 (1.6%) were divorced or widowed. 296 (76.8%) had a diploma or higher degree, 66 (17.1%) were in high school and 23 (5.9%) were illiterate or had only graduated from elementary school. The majority (309 participants, 80.2%) were employed, 36 (9.3%) were housewives and 29 (7.5%) were unemployed. The median monthly income of participants was 10 million Rials with an interquartile range of 7 - 20 million Rials (2 to 6 thousand US dollar). The median number of children that the participants had was 4, with an interquartile range of 3 - 5.

#### 4.2. General Knowledge and Transmission Knowledge about HIV/AIDS

The data analysis (Table 2) showed that most participants had good general knowledge about HIV/AIDS, 71.2% of the responses (mean of all correct responses) were correct in this domain (69.4% of males and 74.9% of females). There was a significant dominance of females in their correct responses to the following true or false statements: AIDS is a hereditary disease ( $P < 0.001$ ), A person infected with HIV is usually diagnosed with symptoms of the disease ( $P = 0.01$ ). The question that was most frequently answered incorrectly (75%) was true or false: AIDS is mostly seen in developing or undeveloped countries, mostly in countries least able to afford to care for infected people. The second most frequent wrongly answered question was AIDS is curable, to which 35% gave the wrong answer.

Seventy-five percent of the participants answered the questions about the ways of transmission correctly (74.8% of males and 76.3% of females). Almost all (98.2%) knew

about the sexual transmission of the disease. A question about transmission via infected syringes, surgery or dentistry instruments, and another about transmission via blood, organ, or tissue donation had remarkable correct response rates (96.6% and 94.8% respectively). Only one question showed a significantly different response rate with a more likelihood for men in two genders: AIDS can be transmitted by donating the blood, organs, or tissue of an infected person to another person ( $P = 0.03$ ). The statement: the breast milk of an infected person can infect her newborn had the most incorrect responses (28%) and almost the same percentage gave the response I do not know to this question.

#### 4.3. Attitudes About HIV/AIDS

More than half of the respondents disagreed that HIV positive students should go to a separate school. They also hesitated as to whether their children would sit in the same armchair or desk with a person with AIDS. On the other hand, they truly accepted HIV as a public health problem and showed a strong willingness to be informed about this syndrome through mass media (Table 3). The following statements showed significant difference in the men and women responses: AIDS is a public health problem and average people should be informed about it ( $P = 0.03$ ) and People with AIDS should inform others about their disease ( $P = 0.02$ ). In the former statement, men were more likely and for the latter women were. However, there was not a statistically significant difference in the total attitude scores of males and females ( $P = 0.50$ ). There was not a statistically significant difference in total attitude scores according to marital status or employment ( $P = 0.08$  and  $P = 0.09$ , respectively). There were statistically significant differences in total attitude scores among people who were educated in different levels ( $P < 0.001$ ).

#### 4.4. Beliefs about HIV/AIDS

Fifty eight percent of respondents were agreed to I will not be infected even if I live with HIV positive persons (Table 4). The following questions showed significant differences in male and female beliefs: AIDS is a punishment from God ( $P = 0.005$ ); marriage is the only way to prevent AIDS ( $P = 0.02$ ); You cannot be infected with HIV/AIDS if you engage in sport and are well nourished ( $P = 0.01$ ); there were statistically significant differences in total belief scores according to gender, educational level and employment ( $P < 0.001$ ,  $P = 0.01$  and  $P = 0.03$  respectively); however, the difference according to marital status was not significant ( $P = 0.06$ ).

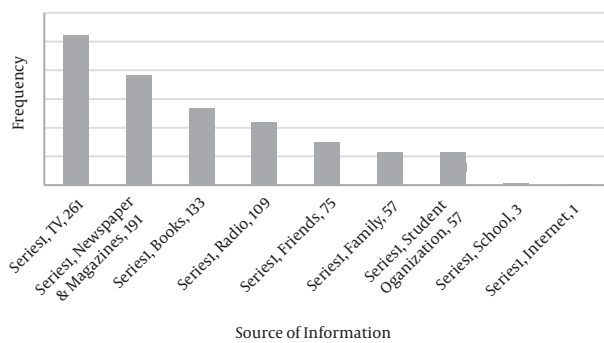
**Table 1.** Composition of the Sample by Gender and Age Groups<sup>a</sup>

Gender	Age Groups							Total
	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80	
Male	45 (64.3)	109 (76.8)	22 (44.0)	28 (68.3)	32 (65.3)	21 (80.8)	6 (85.7)	263 (68.3)
Female	25 (35.7)	33 (23.2)	28 (56.0)	13 (31.7)	17 (34.7)	5 (19.2)	1 (14.3)	122 (31.7)
<b>Total</b>	70 (100.0)	142 (100.0)	50 (100.0)	41 (100.0)	49 (100.0)	26 (100.0)	7 (100.0)	385 (100.0)

<sup>a</sup>Values are expressed as No. (%).

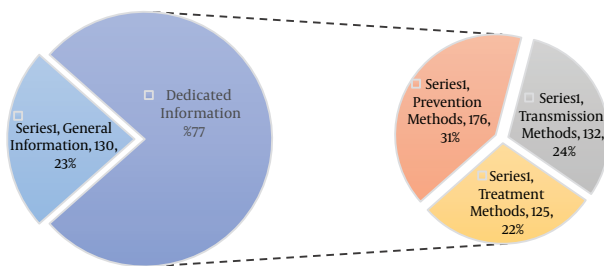
**4.5. Sources of Information on HIV/AIDS**

Figure 3 shows the different sources of information about HIV/AIDS based on the responses of the sample population. Information from school and the internet were the least chosen sources in the sample. The sum is greater than 100% because some people said they received information via two or three different sources.



**Figure 3.** Different Sources for Getting Information About HIV/AIDS

One hundred and thirty (23% of all) requests were for general information about HIV/AIDS. However, 80% of participants wanted specific information about this disease. Information on prevention methods (176 requests-31%) was most frequently requested (Figure 4).



**Figure 4.** Distribution of Required Information Declared by Participants

**5. Discussion**

There have been thousands of studies done on HIV (11-14); it seems that more effort is needed to improve the level of knowledge, attitudes, beliefs, and practices (KABP) of the general population about HIV/AIDS. The results of this study showed that the participants have good knowledge about HIV/AIDS and that in general male participants had better knowledge. There were some misconceptions about the route of transmission and how widespread HIV was, which shows that we should work more to increase knowledge about HIV/AIDS in the general population.

In a questionnaire-based study carried out in China about HIV/AIDS knowledge, attitudes and behaviors among Chinese students, the results indicated that most students had a moderate level of knowledge and moderate attitudes towards people with HIV and AIDS. More positive attitudes were seen in boys (15). In a similar study in a southern Ethiopian city, the results indicated a lower level of knowledge on the various sexual modes of HIV transmission and there was a no difference between males and females in the knowledge domain (16). In a meta-analysis that examined HIV/AIDS knowledge, attitudes, beliefs and behaviors in Latin America, findings revealed that “rising understanding of heterosexual activities as a transmission mode, stigmatization, taboo, poor condom use, masculinity and machismo, and gender roles” were important factors in Latin American countries (17).

In the present study, there was not a statistically significant difference in the total attitude scores of males and females, but there was a significant difference in total attitude scores according to educational level, indicating that educational level could have a great impact on attitude. The results of one study that aimed to assess knowledge, attitudes and behaviors among a group of Indian dental students about managing patients with HIV/AIDS indicated that the total mean knowledge and attitude scores were 78.8% (showing excellent knowledge) and 77.7% (showing positive attitudes) and the difference between male and female students was not statistically significant (18).

In the beliefs domain there was a statistically signifi-

**Table 2.** Frequency and Percentages of Correct Responses to HIV/AIDS Knowledge (n = 385)

Questions	Correct Answer, No. (%)
<b>General knowledge</b>	
AIDS is a viral and infectious disease	310 (80.5)
AIDS is a contagious disease	265 (68.8)
AIDS is a hereditary disease	284 (74)
AIDS is curable	216 (56.1)
AIDS is mostly seen in developing or undeveloped countries, mostly in countries least able to afford to care for infected people	77 (20.1)
AIDS is not a serious disease. It is a simple disease like the common cold	318 (82.8)
The appearance of HIV carriers does not differ from that of the normal population	308 (80)
Immunity is reduced in an HIV positive individual	353 (91.7)
AIDS has a vaccine	230 (59.7)
A person infected with HIV is usually diagnosed with symptoms of the disease	286 (74.3)
Diagnosis is by blood exam	366 (95.3)
<b>Transmission ways</b>	
AIDS can be transmitted from the pool or toilet	285 (74)
AIDS can be transmitted from personal objects such as clothes, comb, underwear and towel	279 (72.5)
AIDS can be transmitted from razors blade with an infected person	312 (81)
Touching an infected person, such as hugging, holding and shaking hands can transmit AIDS	345 (89.8)
Sharing the food utensils of an infected person can transmit AIDS	250 (65.3)
Exposure to an infected person who coughs or spits can transmit AIDS	263 (68.7)
The bite of a mosquito can transmit AIDS	183 (47.7)
Sharing an injection needle or surgical instrument previously used by an infected person can transmit AIDS	371 (96.6)
Donating the blood, organs, or tissue of an infected person to others can transmit AIDS	365 (94.8)
HIV Positive mother can infect her child in the prenatal period	331 (86)
AIDS can be transmitted through sexual intercourse	377 (98.2)
The urine, tears, mucus or nasal fluid of an infected person can transmit AIDS	233 (60.5)
The breast milk of an infected person can infect her newborn	170 (44.2)

cant difference in total belief scores according to gender, educational level, and job. A previous study in 2003 assessed knowledge, attitudes and behaviors concerning HIV among three high-risk groups (cross-border truck drivers, female sex workers and youths) in four cities in Iran. The results indicated that the level of knowledge about HIV was low on average but it was higher in truck drivers and female sex workers than the youths. The main source of their knowledge was personal experience rather than public programs. Condom use was low in all groups (19). In another study, which assessed the knowledge and attitudes of a high-risk female population towards the prevention of AIDS and sexually transmitted infections in Tehran, the results were the same. The results showed that knowledge about HIV and condom use is still inadequate, and attitudes are mainly negative (20). Because of the importance of this subject, numerous studies have been done each year (21-23) and numerous similarities between the current study and the available literature were demonstrated (24-26). We should pay attention that in specific cultural context in Iran, the educators have several limitations to speak about some important factors transmission of the disease and prevention of infection from several common routes such as sexual contact. So we expect that the level of knowledge, attitude and beliefs are affected by this issue comparing to other countries. The key findings of this study can now be used to design population-oriented media according to the results of this study, which was shown in Figures 3 and 4.

The top three sources of information about AIDS in this study were television, magazines and newspapers, and books; therefore, it would seem that these media are the best channels for population-based interventions. The findings of a cross-sectional study that aimed to assess the knowledge and attitudes, sources of information and behaviors relating to HIV/AIDS among female college students in Taiwan revealed that: a significant number of participants were not aware of HIV and AIDS facts and believed many myths about the transmission of HIV and AIDS. The eight main sources of HIV/AIDS information were: television (73.7%), newspapers (59.6%), health professionals (59.6%), radio (59.6%), the Internet (55.6%), school teachers (45.5%), friends (28.3%) and family (18.2%) (25).

One of the limitations of this study was that some elderly people who were asked to answer the questionnaire refused to participate, and most of the people who did participate were male. We used the convenience sampling method, which affected the generalizability of the results. It was very hard work going out in busy areas to carry out the survey and educate people about HIV/AIDS, but we organized this work in our department based on cooperation between faculty members and students. It was a good ex-



**Table 3.** Frequency of Responses to HIV/AIDS Attitude (n = 385)<sup>a</sup>

Questions	Strongly Agree	Agree	Disagree	Strongly Disagree
HIV positive students should go to a separate school	43 (11.3)	118 (30.9)	169 (44.2)	52 (13.6)
If there is a student with AIDS in a school I would withdraw my child from that school	38 (9.9)	103 (26.8)	196 (51)	47 (12)
I would not sit in the same armchair or desk with a person with AIDS	16 (4.2)	49 (12.7)	226 (58)	94 (24)
They should be located or isolated in special center	29 (7.6)	98 (25.6)	180 (47)	76 (19.8)
HIV positive individuals should be supported, treated and helped	222 (58.1)	155 (40.6)	2 (0.5)	3 (0.8)
HIV positive individuals should have social rights like everybody else	227 (59)	140 (36.4)	14 (3.6)	4 (1)
We should let HIV positive individuals to use public toilets & pools	66 (17.4)	161 (42.4)	125 (32.9)	28 (7.4)
Not being a religious or moral person is considered as one of the reasons for getting infected	134 (34.9)	160 (41.7)	69 (18)	21 (5.5)
AIDS is a public health problem and lay people should be informed about it	240 (62.7)	138 (36)	5 (1.3)	0 (0)
People with AIDS should inform others about their disease	192 (50)	168 (43.8)	21 (5.5)	3 (0.8)
Mass media should inform the society about this disease	277 (72.1)	105 (27.3)	2 (0.5)	0 (0)

<sup>a</sup>Values are expressed as No. (%).

**Table 4.** Frequency of Responses to HIV/AIDS beliefs (n = 385)<sup>a</sup>

Questions	Strongly Agree	Agree	Disagree	Strongly Disagree
AIDS is a punishment from God	14 (3.7)	33 (8.6)	185 (48.3)	151 (39.4)
AIDS is not widespread in Iran	9 (2.4)	81 (21.3)	221 (58)	70 (18.4)
I will not be infected even if I live with HIV positive persons	61 (15.9)	162 (42.2)	135 (35.2)	26 (6.8)
Marriage is the only preventive method from AIDS	28 (7.3)	82 (21.5)	215 (56.4)	56 (14.7)
You cannot be infected with HIV/AIDS if you engage in sport and are well nourished	20 (5.2)	49 (12.8)	211 (55.1)	103 (26.9)

<sup>a</sup>Values are expressed as No. (%).

perience for us and we want to continue this project in the near future.

This study showed that despite a remarkable percentage of correct answers in the knowledge domain, more attention should be paid to improving attitudes and beliefs. As mentioned before, three factors including widespread ignorance, lack of information, and misconceptions about the disease in society may be responsible for social stigma. The endpoint of all public health efforts is to direct society along the road to health, and policy makers should take into account the fact that knowledge in itself may not result in correct behavior. Good programming and health policy development can reduce high-risk behaviors in society as a whole.

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### Footnotes

**Authors' Contribution:** Maliheh Dadgarmoghaddam was responsible for study concept and design, analysis and interpretation of data, drafting of the manuscript and critical revision of the manuscript for important intellectual content; Mohammad Khajedaluae was responsible for study concept and design, critical revision of the manuscript for important intellectual content; Majid Khadem-Rezaiyan was responsible for study concept and design, analysis and interpretation of data, drafting of the manuscript and critical revision of the manuscript for important intellectual content.

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