Knowledge of and attitudes towards HIV/AIDS in Mashhad, Islamic Republic of Iran

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المعارف والمواقف حول مرض الإيدز والعدوى بفيروسه، في مشهد، بجمهورية إيران الإسلامية

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الخلاصة: في إطار السعي لتقييم المعارف والمواقف حول مرض الإيدز والعدوى بفيروسه، في مدينة مشهد، بجمهورية إيران الإسلامية، قام 960 شخصاً تتراوح أعمارهم بين 13 و58 عاماً، ممن استُوقِفوا في الشارع ووافقوا على الاشتراك في هذه الدراسة، باستيفاء استبيان لا تُذكر فيه الأسماء. وقد بلغ وسطي المعارف والمواقف حول هذا المرض 9.8 (بانحراف معياري 3.0) و6.1 (بانحراف معياري 3.0) من إجمالي قدره 14 و10 على الترتيب. وكانت مواقف الأشخاص الذين هم أكثر معرفة بمرض الإيدز والعدوى بفيروسه أكثر إيجابية نحو الأشخاص المتعايشين مع هذا المرض ($P < 0.01$). وتبين أن ثَمَّة مفاهيم خاطئة مهمة حول طرق انتقال مرض الإيدز والعدوى بفيروسه، مثل انتقاله عن طريق العِنَاق، أو بالغذاء، أو بالملابس، أو في الأماكن العامة، أو بلدغات الحشرات. وقد دلَّ تحليل التحوف على أن مواقف النساء كانت أكثر تسامحاً من مواقف الرجال في هذا الشأن ($P < 0.01$). كما دلَّ أيضاً على أنه كلما ارتفع مستوى التعليم لدى المجيبين، زادت معرفتهم عن هذا المرض، وتحسنت مواقفهم تجاهه ($P < 0.0001$ و$P < 0.001$ على الترتيب).

ABSTRACT To assess knowledge and attitudes about HIV/AIDS in Mashhad, 960 people aged 13–58 years who were approached in the street and agreed to participate completed an anonymous questionnaire. The mean of knowledge and attitudes scores were 9.8 (SD 3.0) and 6.1 (SD 3.0) of a total 14 and 10 respectively. People with greater knowledge of HIV/AIDS had more positive attitudes to individuals with HIV/AIDS (***P*** < 0.01). There were important misconceptions about HIV transmission such as through hugging, food, clothing, public places and insect bites. Regression analysis indicted that women had more tolerant attitudes than men (***P*** < 0.01) and the more educated respondents had higher knowledge and attitudes scores (***P*** < 0.0001 and ***P*** < 0.001 respectively).

Connaissances et attitudes vis-à-vis du VIH/sida à Mashhad (République islamique d'Iran)

RÉSUMÉ Aux fins d'une évaluation des connaissances et des attitudes vis-à-vis du VIH/sida à Mashhad, un questionnaire anonyme a été soumis à 960 personnes âgées de 13 à 58 ans, qui ont été abordées dans la rue et qui ont accepté de participer à l'enquête. La moyenne des scores relatifs aux connaissances et aux attitudes était de 9,8 (écart type 3,0) et 6,1 (écart type 3,0) sur un total de 14 et de 10 respectivement. Les personnes qui avaient le plus de connaissances sur le VIH/sida avaient des attitudes plus favorables envers les individus atteints du VIH/sida ($p < 0,01$). Nombre de personnes avaient des idées erronées sur la transmission du VIH/sida et pensaient par exemple que celle-ci pouvait se faire lors d'une accolade, par la nourriture, par les vêtements, dans les lieux publics ou par une piqûre d'insecte. L'analyse de régression a indiqué que les femmes avaient des attitudes plus tolérantes envers les hommes ($p < 0,01$) et que les personnes interrogées les plus instruites obtenaient des scores plus élevés en ce qui concerne les connaissances et les attitudes ($p < 0,0001$ et $p < 0,001$ respectivement).

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Introduction

Based on the available data, up to 23 September 2007, the cumulative number of reported HIV-positive cases in the Islamic Republic of Iran was 16 090, 1122 of which were AIDS patients. Of these HIV-positive individuals, 66.7% were intravenous drug users (IDUs) and 7.5% were infected by sexual intercourse; 23.7% of cases were classified as "unknown" route of transmission [*1*].

There have been growing concerns about the prevalence of HIV/AIDS in the Islamic Republic of Iran, although the country falls in the "low epidemic" group and the prevalence of infected adults is less than 0.1% [*2,3*]. It is believed that the real status of infection is likely to be more serious than the published data indicate. The World Health Organization (WHO) estimated that at the end of 2003 there were 31 000 Iranians living with HIV/AIDS [*4*]. It has been stated that the number of reported cases of HIV/AIDS during the period from 2001 to 2005 was 3.7 times that during the 15-year period before (11029 and 2977 respectively) [*1*]. There are several factors that place the Islamic Republic of Iran in a position where HIV infection could spread rapidly if appropriate actions are not taken. These include: the long borders with countries such as Afghanistan, where a substantial proportion of the world's opium is grown [*5*], a high prevalence of addiction in the country [*5*], frequent sharing of needles among IDUs [*6,7*], a high proportion of young people within the population [*8*], increasing age at marriage [*9*], increasing rates of divorce [*10*], high rates of sexually transmitted infections [*11,12*], and limited sexual health education.

Lack of awareness and misconceptions by the public about HIV/AIDS can lead to the spread of the disease. Therefore, increasing the level of people's general knowledge and attitudes is fundamental to protecting the population from HIV infection [*13*].

Little is known about HIV/AIDS awareness in the Islamic Republic of Iran. A few studies have been conducted by academic and research centres in isolation, most of which focused on special groups such as students and prisoners [*14–19*]. A few years ago, a study showed that 90% of people 15 years of age and above in Kermanshah, in the north-west of the country, did not know the modes of transmission of HIV [*20*]. Another study in Sanandaj in the province of Kordestan, also in the north-west of the country, found that 70% of people 15 years of age and above had no or little awareness about HIV transmission [*21*].

This paper presents the findings of a survey which was part of a community-based HIV/AIDS education programme conducted in Mashhad. The objectives were: i) to assess people's knowledge of HIV/AIDS in terms of conditions related to infection, modes of transmission and prevention, and ii) to assess people's attitudes towards HIV-infected individuals.

Methods

Study area

The study was conducted in Mashhad, the capital city of the province of Razavi Khorasan in the north-east of the Islamic Republic of Iran. This city is the second largest city in the country after Tehran, the capital city of the country [*22*].

Reported cases of HIV/AIDS in Razavi Khorasan province are less than 3% of the total cases in the country [*1*], despite the fact that 8% of the Iranian population lives in this province [*23*]. Nevertheless, some factors may be risk factors for the spread of disease in this area. Mashhad is an important

Shia holy city and attracts millions of tourists and pilgrims every year [*22*]. Furthermore, many Afghan immigrants have resided in the country for many years and Mashhad has been one of their primary destinations because of its proximity to Afghanistan [*24,25*].

Subjects

This cross-sectional study was conducted by the Research Centre for HIV/AIDS Viral Hepatitis, Mashhad Branch of the Iranian Academic Center for Education, Culture & Research, on 30 November 2004 (a day before World AIDS Day and the beginning of a national HIV/AIDS information programme). HIV/AIDS information stations were set up in 7 crowded areas and passing individuals 15 years of age and above who expressed a willingness to participate in the study were selected. These volunteers completed an anonymous questionnaire and at the same time they were assured that their answers would be kept confidential and would not be revealed to a third party. They were also given the choice to skip any questions they did not feel comfortable with.

Questionaire

A self-administered questionnaire was designed and administered to the volunteers. It included 42 closed-ended questions which were drawn up after reviewing samples of relevant studies conducted at home and in other countries. To establish face and content validity of the survey, the questionnaire was reviewed by an infectious diseases specialist and a medical executive of the health authority of the province. Ten questions were judged invalid (unsuitable for measuring knowledge and attitudes to HIV/AIDS) and excluded. The Cronbach α was calculated to assess internal consistency of knowledge and attitudes questions ($\alpha = 0.66$ and $\alpha = 0.82$ respectively). Five questions were removed because of low internal consistency. Finally, 27 questions were used in data analysis. These questions covered the following areas: demographic information (5 questions); knowledge of HIV/AIDS (14 questions) including conditions related to infection, modes of transmission and prevention; attitudes towards HIV-infected individuals (5 questions); and other items (3 questions). These last 3 questions related to the respondents' beliefs about their knowledge of transmission, prevention and management of HIV/AIDS.

Data analysis

The knowledge questions gave 3 options, "true", "false" and "don't know". Incorrect answers and "I don't know" answers were given a zero score, while 1 point was given to each correct answer. The total score ranged from 0 to14. The scores were arbitrarily classified at 3 levels of knowledge: high (score of 11 and above), moderate (score of 6 to 10) and low (score of 5 and less).

Regarding the attitudes questions, 0 to 2 points were assigned for each answer and the total score ranged from 0 to 10. Attitudes scores were arbitrarily classified at 3 levels: tolerant (score of 8 and above), neutral (score of 4 to 7) and less tolerant (score of 3 and less).

Data were analysed with *SPSS* for Windows, version 11.0. Results were expressed as frequencies, median, mean and standard deviations (SD). The association between demographic parameters and respondents' knowledge and attitudes was evaluated by the Mann–Whitney test, Kruskal–Wallis test and multivariate regression analysis. For multivariate analysis, nominal variables, such as sex, occupation and marital status were coded using the technique of "effect coding". This system uses 1s, 0s and –1s for nominal variable levels. In the prediction equation,

the overall mean of the dependent variable is called the *grand* mean. This type of coding tests how the mean of each group differs from the grand mean [*26*]. Also, the Spearman correlation test was used to find any correlation between knowledge and attitudes scores. A *P*-value of < 0.05 was considered statistically significant.

Results

A total of 960 completed questionnaires were collected, 15 of which were rated invalid and excluded from the analysis because: the whole form was left blank, only the second page of the 2-page questionnaire was completed, all the alternatives were ticked in response to each question or one particular alternative was marked for all questions. Thus 945 questionnaires were included in the final analysis. The age of the respondents ranged from 13 to 58 years (median, 23 years); 5 people initially indicated they were 15 but subsequently put their ages as 13 or 14 years in the questionnaire and we did not exclude them from the analysis. Table 1 shows the sociodemographic characteristics of the respondents. The majority of respondents were men (76.3%), 48.6% were in the age range 20–29 years, 58.8% were single, 33.7% were self-employed and almost half (49.5%) had high-school education.

The mean knowledge score was 9.8 (SD 3.0); 463/941 (49.2%) respondents had high knowledge, 381 (40.5%) had moderate knowledge and 97 (10.3%) had low knowledge about HIV/AIDS. Only 59 (6.3%) individuals got the full score of 14.

As regards the respondents' beliefs about their knowledge of HIV/AIDS, 81.6% thought they had moderate to full knowledge of HIV/AIDS transmission, 76% thought they had moderate to full knowledge of prevention and 42.8% thought they had moderate to full knowledge of HIV/AIDS management.

Table 1 **Sociodemographic distribution of the study sample**

Variable	No.	%
Age (years) (n = 906)		
< 19	254	28.0
20–29	440	48.6
30–39	143	15.8
≥ 40	69	7.6
Sex (n = 926)		
Male	707	76.3
Female	219	23.7
Marital status (n = 934)		
Single	549	58.8
Married	376	40.3
Divorced/widowed	9	1.0
Occupation (n = 905)		
Employed in the public sector	136	15.0
Employed in the private sector	86	9.5
Self-employed	305	33.7
School student	125	13.8
University student	145	16.0
Unemployed	108	11.9
Educational level (n = 909)		
Elementary school	46	5.1
Secondary school	119	13.1
High school[a]	454	49.9
2-year associate course	126	13.9
Bachelor degree	133	14.6
Master and higher degree	31	3.4

[a]***One-year pre-university course was also included in this category.***

Table 2 shows the participant's knowledge about HIV/AIDS in terms of conditions related to infection, modes of transmission and methods of prevention of HIV/AIDS. Although the majority seemed to have accurate knowledge about HIV/AIDS, there were still important misconceptions; for example some respondents believed that HIV could be acquired through hugging, mosquito bites and clothes, and others believed that HIV could be prevented by avoiding of public places (toilets, swimming pools, bathrooms), not eating with HIV-infected people, and discontinuing interaction with

Table 2 **Distribution of responses regarding participants' knowledge of HIV/AIDS**

Knowledge statement	Number	Answers, % of participants		
		Correct	Incorrect	Don't know
Conditions related to infection				
Young and healthy people are not affected by HIV/AIDS	918	63.7	29.5	6.8
HIV/AIDS patients can infect other people only if they have symptoms	915	50.3	41.6	8.1
HIV/AIDS patients may have no symptoms for many years	919	88.2	5.5	6.2
Only people with unrestrained sexual behaviour and injecting drug users are affected by HIV/AIDS	916	71.2	25.8	3.1
HIV/AIDS patients cannot infect others if they appear healthy and young	910	81.2	13.6	5.2
Modes of transmission				
If you hug a HIV-infected person, you may be infected	919	85.7	7.2	7.1
HIV/AIDS can be transmitted by insect/mosquito bites	905	53.1	28.8	18.0
Sharing razors or toothbrushes is a risk factor for HIV/AIDS transmission	894	94.7	3.7	1.6
Wearing the clothes, glasses or jewellery of an HIV-infected person is a risk factor for HIV/AIDS transmission	904	76.0	12.3	11.7
Methods of prevention				
Condom use is effective in HIV/AIDS prevention	917	72.1	14.8	13.1
People must avoid eating with HIV-infected persons for HIV/AIDS prevention	923	73.8	18.1	8.1
People must avoid public environments such as swimming pools, toilets and bathrooms for HIV/AIDS prevention	927	68.5	21.6	9.9
People must remain faithful to their spouses for HIV/AIDS prevention	885	81.2	13.1	5.6
Avoiding interaction with HIV-infected individuals is effective in HIV/AIDS prevention	890	52.2	41.6	6.2

HIV-infected people. In addition, 29.5% of the respondents believed that young and healthy people would not be affected by HIV/AIDS, 41.6% believed that HIV-infected people could transmit infection to others only if they had symptoms, and 25.8% believed that only IDUs or people with unrestrained sexual behaviour are affected by HIV/AIDS.

The mean attitudes score was 6.1 (SD 3.0); 329/908 (36.2%) respondents had more tolerant attitudes, 389 (42.8%) had neutral and 190 (20.9%) had less tolerant attitudes towards HIV-infected people. Only 171 (18.8%) individuals obtained the total score of 10.

Table 3 shows the participant's attitudes towards HIV-infected persons. It seems that avoidant intentions about HIV/AIDS are fairly common in our study. The majority would either limit or discontinue interaction with individuals if they knew they were HIV/AIDS affected.

Table 3 **Distribution of responses about participants' attitudes towards people with HIV/AIDS**

What would you do if:	No.	%
You were affected by HIV/AIDS? (n = 870)		
Pursue a normal life	492	56.6
Live with fear, anxiety and anguish	248	28.5
Commit suicide	130	14.9
One of your close relatives were affected by HIV/AIDS? (n = 883)		
Interact as before	364	41.2
Limit interaction	359	40.7
Discontinue interaction	160	18.1
One of your friends were affected by HIV/AIDS? (n = 879)		
Interact as before	335	38.1
Limit interaction	353	40.2
Discontinue interaction	191	21.7
One of your colleagues were affected by HIV/AIDS? (n = 884)		
Interact as before	348	39.4
Limit interaction	375	42.4
Change your workplace	161	18.2
You were aware that the person sitting close to you was affected by HIV/AIDS? (n = 888)		
Continue to sit next to him/her with no concern	502	56.5
Continue to sit next to him/her with caution and fear	105	11.8
Move away	281	31.6

Table 4 shows the knowledge and attitudes scores according to sociodemographic factors. No significant difference was found in the knowledge scores of men and women but women had more tolerant attitudes than men ($Z = -3.0$, $P < 0.01$). There were no statistically differences in knowledge or attitudes scores according to marital status. Knowledge scores were correlated with age (Spearman rank correlation = 0.09, $P < 0.01$, $n = 901$), although people aged 20–29 years had the highest knowledge scores and the people 19 years of age and under had the lowest scores ($\chi^2_3 = 18.3$, $P < 0.001$). On the other hand, attitude scores were not correlated with age and no significant difference was found in the attitudes scores of people of different age groups.

There were statistically significant differences in knowledge and attitudes scores according to occupation and educational level ($P < 0.0001$). University students had the highest knowledge scores while school students and self-employed people had the lowest scores in comparison with other job groups ($\chi^2_5 = 49.4$, $P < 0.0001$). Also university students had the highest attitudes scores whilst self-employed people had the lowest ($\chi^2_5 = 26.5$, $P < 0.0001$). In addition, respondents with higher levels of education had higher knowledge and attitudes scores ($\chi^2_5 = 110.3$, $P < 0.0001$ and $\chi^2_5 = 34.7$, $P < 0.0001$ respectively).

Finally, attitude was significantly correlated with knowledge (Spearman rank correlation = 0.46, $P < 0.0001$, $n = 907$); people with greater knowledge scores had better attitudes scores.

In the multivariate analysis, knowledge score was significantly associated only with educational level, while attitudes score was significantly associated with sex and educational level (Table 5).

Discussion

The present study showed that overall knowledge of HIV/AIDS is relatively satisfactory in Mashhad. In earlier studies in other cities of the Islamic Republic of Iran, it was shown that knowledge of HIV/AIDS among the general population was very low [*20,21*]. The reasons for the observed differ-

Table 4 **Knowledge and attitudes scores regarding HIV/AIDS according to sociodemographic characteristics of the participants**

Variable	Knowledge score			Attitudes score		
	No.	Mean (SD)	*P*-value	No.	Mean (SD)	*P*-value
Age (years)						
< 19	253	9.3 (2.9)		242	6.0 (3.0)	
20–29	437	10.2 (2.9)		427	6.2 (3.0)	
30–39	142	9.9 (3.1)		139	5.9 (2.9)	
≥ 40	69	9.5 (3.6)		66	6.5 (2.6)	
Total	901	9.8 (3.0)	< 0.001[a]	874	6.1 (3.0)	NS
Sex						
Male	704	9.8 (3.0)		677	5.9 (3.0)	
Female	218	10.0 (2.9)		212	6.6 (2.8)	
Total	922	9.8 (3.0)	NS	889	6.1 (3.0)	< 0.01[b]
Marital status						
Single	547	9.8 (2.9)		529	6.1 (3.0)	
Married	374	9.8 (3.2)		359	6.1 (2.9)	
Divorced/widowed	9	8.9 (4.0)		9	6.6 (2.6)	
Total	930	9.8 (3.0)	NS	897	6.1 (3.0)	NS
Occupation						
Employed in the public sector	135	9.8 (3.1)		130	5.7 (3.0)	
Employed in the private sector	86	10.7 (2.8)		85	6.7 (2.5)	
Self-employed	303	9.2 (3.3)		292	5.5 (3.2)	
School student	125	9.1 (3.1)		118	6.0 (3.0)	
University student	145	11.0 (2.3)		140	7.0 (2.6)	
Unemployed	107	9.9 (2.8)		105	6.0 (2.8)	
Total	901	9.8 (3.1)	< 0.0001[a]	870	6.0 (3.0)	< 0.0001[a]
Educational level						
Elementary school	45	6.2 (3.6)		40	4.2 (2.8)	
Secondary school	118	8.4 (3.0)		116	5.1 (3.2)	
High school[c]	453	9.9 (2.9)		439	6.2 (3.0)	
2-year associate course	123	10.8 (2.2)		120	6.6 (2.8)	
Bachelor degree	133	10.7 (2.5)		128	6.4 (2.7)	
Master/higher degree	31	11.8 (2.1)		30	7.0 (2.5)	
Total	903	9.8 (3.0)	< 0.0001[a]	873	6.1 (3.0)	< 0.0001[a]

[a]P-*value was calculated using Kruskal-Wallis test.*
[b]P-*value was calculated using Mann–Whitney test.*
[c]*One-year pre-university course was also included in this category.*
SD = standard deviation; NS = not significant.

ence could be the higher educational level of the respondents in our study as well as the fact that this study is more recent than previous ones. In recent years, Iranian authorities like the Ministry of Health and Medical Education and the Ministry of Education have paid a special attention to HIV/AIDS and have sought to increase AIDS awareness, especially among high-risk groups like students, prisoners and IDUs, through organizing national and pro-

Table 5 **Regression analysis for factors associated with knowledge and attitudes scores regarding HIV/AIDS**

	Variable	R	R^2	R^2 change	B	*t*	*P*-value
Knowledge	Constant				8.18	29.74	< 0.0001
	Educational level	0.322	0.104	0.104	0.57	8.70	< 0.0001
Attitudes	Constant				5.17	17.15	< 0.0001
	Educational level	0.162	0.026	0.026	0.32	4.51	< 0.0001
	Sex (female)	0.184	0.034	0.008	0.31	2.47	< 0.05

vincial teams and task forces and working in collaboration with international organizations such as WHO Regional Office for the Eastern Mediterranean, UNAIDS and the United Nations Population Fund [*3,27*].

Although overall knowledge of HIV/AIDS was relatively high, knowledge of how HIV/AIDS is not transmitted and prevented was limited. There were many misconceptions about HIV/AIDS transmission such as by using public places, food, clothing and insect bites. This problem has also been found by many other investigators in the Islamic Republic of Iran and other countries [*14,28–30*].

In our study, no significant difference was found between HIV/AIDS knowledge of men and women. This finding is consistent with those of Darabi and Lanouette et al. [*20,29*]. However, some studies have shown that women have higher knowledge than men [*15,21*], while other studies indicate the opposite [*28,30,31*]. In the study of Nakhaee, women had a higher level of overall knowledge of HIV/AIDS in comparison with men, although knowledge of modes of HIV/AIDS transmission and prevention was the same for both sexes [*18*].

Multivariate analysis in our study revealed no significant difference of knowledge level among the different age groups. However, some studies have reported that younger people have a higher knowledge in comparison with older people [*21,28,29,32*]. On the other hand, Ramazankhani et al. found that older students had greater knowledge than younger students [*15*]. In another study, knowledge of HIV/AIDS transmission decreased among older people, but prevention knowledge scores were the same among all age groups [*18*].

In the present study, knowledge of HIV/AIDS was the same among different marital groups. This differs from Yerdaw, Nedi and Enquoselassie who found that married people had relatively lower knowledge of HIV transmission in comparison with the non-married population [*28*].

In multivariate analysis there was no significant difference in knowledge of HIV/AIDS among different occupational groups. This is consistent with the finding of Asaduzzaman Khan [*32*]. In some studies, it has been documented that certain occupational groups have greater knowledge than others. In a study by Darabi, knowledge of both school and university students was higher than employees and they were more well-informed than self-employed people as well as homemakers [*20*]. Also, Mea'mar showed that employees were the best informed people, whereas homemakers were the least, regarding the modes of HIV prevention [*21*].

In our study the level of education was significantly associated with knowledge about HIV/AIDS. This finding has

been confirmed by many other studies [*20,21,28,30,32*]. However, Lanouette et al. found no relation between knowledge of HIV/AIDS and educational level [*29*]. Nakhaee found no significant relation between the overall knowledge scores and educational level while the knowledge levels on HIV/AIDS transmission and prevention were both directly associated with educational level [*18*].

It should be noted that none of the cited studies, apart from that of Asaduzzaman Khan [*32*], used multivariate analysis to assess the factors associated with HIV/AIDS knowledge. Therefore, comparison of several studies has some shortcomings.

Our study indicated that attitudes towards HIV/AIDS are not very tolerant in Mashhad. In the study of Ramezankhani et al. the attitudes of students was considered satisfactory as four-fifth of the students had a medium to high attitude [*15*]. On the other hand, Tavoosi et al. [*14*] and Yerdaw, Nedi and Enquoselassie [*28*] reported an intolerant attitude towards HIV/AIDS. The variation in attitude level in different studies could be due in part to different questions posed to evaluate this aspect. In our study, 32% of participants stated that if they were aware the person sitting next to them was affected by HIV/AIDS, they would move away. The study by Tavoosi et al. also indicated that 35% of students preferred not to sit near an HIV-positive person in class [*14*]. In addition, 42% of participants in our study indicated that they would limit their interaction with their colleagues if it was known that he/she was affected by HIV/AIDS, and 18% said they would change their workplace. Herek, Capitanio and Widaman reported that 19% of participants in a 1991 survey would avoid a co-worker with AIDS. The percentage declined to 12% and 9% respectively in 1997 and 1999 [*33*].

The present study showed that women had more tolerant attitudes than men towards individuals affected with HIV/AIDS. This is consistent with the finding of Ramezankhani et al. [*15*]. However in the study of Tavoosi et al. no difference was observed between the attitudes of male and female students with regards to avoidant intentions. For example, one-fourth of male and female students indicated that they would not shake hands with an HIV-positive person if they knew about his or her disease. Nevertheless, girls were more compassionate while boys expressed more hatred towards HIV-infected individuals [*14*].

The attitude scores were the same among the different age groups in the current study. This was found to be true of high-school students in the study of Tavoosi et al. [*14*].

Finally, the present study found a significant relation between attitudes towards HIV/AIDS and knowledge level, and a positive correlation between knowledge and attitudes scores. This relation was also reported by Tavossi et al. [*14*]; in their study, people with lower knowledge levels had more negative attitudes towards HIV-infected individuals.

The present study has some limitations. First, the study was conducted in 7 arbitrarily selected areas of the city of Mashhad; these were generally low and average income residential districts. The participants were drawn from those who happened to pass our AIDS prevention information stations, who showed interest and who agreed to participate. They were therefore a self-selected group. Indeed there were differences between the participants and the general population of Mashhad with regard to sex ratio and other demographic features. Furthermore, not all the participants were necessarily residents of the areas under study since travellers from

other cities as well as residents of other districts could have been included in the study. Therefore our findings cannot be generalized to the population of Mashhad. Data were collected using a self-completed anonymous questionnaire and the reliability of the answers cannot be guaranteed.

A much broader study is suggested in which participants are randomly selected from different districts of the city in order to verify the current findings. Also, since higher levels of knowledge and attitudes do not necessarily result in behavioural modification, a simultaneous study of knowledge, attitudes and behaviours related to HIV/AIDS is suggested.

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WHO Global InfoBase Online: data for saving lives

The WHO Global InfoBase is a data warehouse that collects, stores and displays information on chronic diseases and their risk factors. The InfoBase has, for the first time, assembled in one place, country-level risk factor data stratified by age and sex, with complete source and survey information. The current version contains over 130 000 data points from more than 2800 sources. Currently the InfoBase, which is updated daily, contains reports on 180 out of 192 WHO Member States. A unique feature is that each record can be linked back to all its survey information, including the primary source.

Using the database, it is possible to get an idea of the impact of a disease in any WHO Member State and discover the leading causes of deaths in men and women. For each country, the user can select to view data on the country burden (mortality/incidence) profile or the country risk factor profile. The search function allows users to customize their data search based on specific criteria.

The WHO Global InfoBase can be accessed at: http://www.who.int/infobase/report.aspx