ORIGINAL RESEARCH ARTICLE

Knowledge and attitudes of physicians in private practice towards HIV/AIDS in Mashhad, Iran

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Summary: Being responsible for providing care for HIV/AIDS in a society, physicians should be knowledgeable and have favourable attitudes. We designed a cross-sectional study to assess knowledge and attitudes towards HIV/AIDS of private practicing physicians in Mashhad, Iran. A total of 346 general practitioners and specialists completed anonymous self-administered questionnaires with response rate of 91.1%. For knowledge questions, the mean proportion of correct responses was 53.5% (±13.2). Misconceptions about HIV transmission were the main areas of insufficient knowledge. Surprisingly only 20% knew how to manage a patient who had experienced sexual contact with an HIV-positive partner. While 84% disagreed that 'HIV-infected individuals deserved to catch infection' owing to high-risk behaviours, 38% sympathized less with people who were infected via extramarital sex. It seems that knowledge and attitudes towards HIV/AIDS among the studied physicians is not favourable and is an area that requires attention to enable effective management of the disease in Iran.

Keywords: HIV/AIDS, knowledge, attitudes, physician, Iran

INTRODUCTION

The global spread of HIV has meant countries like Iran are now affected. From the first confirmed AIDS case in a haemophilic boy in 1986,[1,2] the cumulative number of officially registered HIV infections in Iran had reached 18,881 by December 2008, 1730 of which were AIDS diagnoses.[3] Factoring in unreported cases gives an estimated 68,000–110,000 HIV/AIDS infections in 2007 according to UNAIDS.[4] Recorded HIV transmission routes in Iran include injection drug use (IDU) (69.3%) and sexual contact (8.0%) yet transmission route is unknown for 20.8% of cases.[3]

According to the UNAIDS, HIV prevalence in adults is less than 0.2% in Iran, and thus Iran is categorized as 'low epidemic'.[4] Yet concern exists, due to the increase in HIV/AIDS cases in recent years, as evidenced by the report of the Iranian Ministry of Health and Medical Education, 2008,[3] stating that two-thirds of all cases were reported in the last six years. Whether this was a result of better diagnostics or was true increased transmission, this necessitates a re-evaluation of the readiness of the health system to deal with HIV.

A physician has a role to advise at-risk individuals and patients regarding their health, but this is impractical unless physicians are well informed in all aspects of a disease. Managing HIV/AIDS requires a thorough understanding of the disease as well as appropriate attitudes and evidence-based practice. Hence, this study was designed to assess the knowledge of physicians about HIV/AIDS, and their attitudes relevant to the condition. There are only a few published studies on this topic in Iran,[5–8] as well as some studies involving nurses, other health-care workers and medical students.[9–11] While the survey on nurses in Shiraz, Iran, in 2003 showed insufficient knowledge about transmission routes,[9] studies in other Middle East countries such as Kuwait and other neighbouring countries (e.g. Turkey) have revealed unfavourable knowledge and attitudes.[12,13]

Family medicine is not a common practice in Iran;[14] therefore, those at risk or concerned about HIV/AIDS might either present to government clinics, where free HIV counselling, testing and treatment are provided,[15] or choose to see general practitioners (GPs) or specialist physicians in private practices. Thus, we surveyed a random sample of office-based GPs and specialists in private practice with respect to their knowledge and attitudes towards HIV/AIDS in Mashhad, Iran.

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MATERIALS AND METHODS

This cross-sectional study was carried out in April–May 2007 in Mashhad, Iran. Mashhad, the centre of the Razavi Khorasan province, is the second largest city in Iran, with a population of approximately three million.[16] In addition, most of Iran's 1.2 million immigrants from Afghanistan, the biggest opium producer in the world,[17] live in Mashhad.[18] More than 20 million tourists and pilgrims also come to Mashhad, the second largest holy city of the world, annually.[19]

From the 1589 private practicing physicians of Mashhad (810 GPs and 779 specialists) a sample of 210 GPs and 170 specialists were included in the research by random cluster sampling. Clusters were from 56 geographic regions, categorized according to the office addresses in the list of the Medical Documents Office of Social Security Organization. This public institution for health insurance, enlists all private practicing physicians of the whole city. We tried to make the study population representative of private physicians of Mashhad. Five clusters in suburbs with 26 physicians and those with fewer than eight GPs or specialists were excluded because of practical limitations. These suburban clusters contained mostly newly graduated physicians and predominantly GPs. These two factors might affect the generalizability of the findings, although they comprised <10% of the total. From the remaining 41 clusters with GPs and 13 ones with specialists, 10 and four clusters were randomly selected, respectively. All the GPs or specialists in each selected cluster were asked to participate in the study. Following a phone call, the investigators attended each doctor's office with a letter signed by the chair of Medical Council of Mashhad, asking physicians to fill out an anonymous self-administered questionnaire and emphasizing the confidentiality of the data. Investigators attended the offices again to collect the completed questionnaires. SPSS version 13.0 (SPSS Inc, Chicago, IL, USA) was used for statistical analyses. Due to lack of a previously standardized relevant questionnaire in Iran, the authors designed an initial questionnaire with 72 closed questions and its validity and reliability was assessed by a pilot study, with participation of 26 doctors. The participants in our pilot study were part of the population of private physicians of the whole city, selected from one region and not included in the main study afterwards. Six-knowledge questions to which >85% or <15% of respondents could respond correctly, together with six attitudes questions which were determined as less relevant by the researchers were excluded. A final questionnaire with 60 valid questions, including personal and professional characteristics (11 questions), knowledge about HIV/AIDS (34 questions), 15 Likert scale questions on attitudes (including beliefs about HIV-positive individuals, health-care provider's authority in taking care of AIDS patients and fear of HIV infection acquisition in practice) was developed with a reliability coefficient of 0.73 for knowledge questions by he Kuder–Richardson method (KR_{20}) and 0.79 for attitudes questions by Cronbach's Alpha Co-efficient.

RESULTS

From the 380 selected physicians, 346 answered the questionnaire (response rate = 91.1%). Samples were similar to the population of Mashhad physicians according to gender and educational status. No validated data about age and experience of the physicians were present from the population to allow us to compare results. Personal and professional data of respondents are given in Table 1. Visiting at least one known HIV/AIDS case was declared by 32.2% of 334 generalists and specialists in various fields.

Knowledge about HIV/AIDS

The mean proportion of correct responses to knowledge questions was 53.5% (±13.2), with no difference between GPs and specialists. Major features of HIV infection such as transmission routes, incubation and window periods, survival length, diagnostic criteria and antiretroviral therapy were issues of low knowledge among physicians participating in the study (Table 2). For instance, respondents believed in common myths about HIV transmission, mainly considering tears, saliva or insect bites as transmission routes. In addition, only two-fifths of the participants knew the true risk level of HIV transmission through needle stick injuries. Only seven of 239 respondents could correctly rank the risk of HIV transmission for five different types of sexual contacts, and others did not answer to this question. However, 22.3% and 50.9% of the participants stated correctly that receptive anal sex and oral sex were the highest and lowest risk sexual transmission routes, respectively.

Two-thirds of 326 respondents stated that training courses on HIV/AIDS were either insufficient or less sufficient during their medical education. Graduate and postgraduate education (60.0%), scholarly journals and books (69.3%) and continuous medical education courses (36.1%) were reported by physicians to be their main information sources about HIV/AIDS.

Table 1 **Personal and professional characteristics of the respondents***

	General practitioners (n = 193)	Specialists (n = 147)	Total† (n = 346)
Age (years)			
Number	193	145	339
Mean ± SD	41.1 ± 8.1	50.4 ± 10.9	45.1 ± 10.5
Range	28–79	31–76	28–79
Gender			
Male	138 (71.1)	102 (70.3)	241 (70.9)
Female	56 (28.9)	43 (29.7)	99 (29.1)
Marital status			
Single	12 (6.2)	7 (4.9)	19 (5.6)
Married	176 (90.7)	136 (94.4)	313 (92.3)
Divorced/widowed	6 (3.1)	1 (0.7)	7 (2.1)
Years since graduation (last course)			
Number	188	142	332
Mean ± SD	12.1 ± 6.9	16.3 ± 9.7	13.9 ± 8.5
Range	2–43	2–40	2–43
Years of practice			
Number	190	144	336
Mean ± SD	12.1 ± 7.8	21.1 ± 10.9	16 ± 10.3
Range	1–49	2–54	1–54
Attended an HIV/AIDS seminar after graduation?			
Yes	80 (42.6)	41 (28.9)	123 (36.9)
No	71 (37.8)	80 (56.3)	152 (45.6)
Can not remember	37 (19.7)	21 (14.8)	58 (17.4)
Number of HIV patients visited by the physicians			
0	124 (66.7)	99 (69.2)	223 (67.8)
1–2	42 (22.6)	24 (16.8)	66 (20.1)
>3	20 (10.8)	20 (14.0)	40 (12.2)

*Figures in brackets represent % of n or the closest figure to this due to missing data

†Due to missing data, sum of general practitioners and specialists numbers may be less than total number

Attitudes towards HIV/AIDS

Although four-fifths of respondents disagreed that 'most of HIV-infected people deserved to catch the infection owing to their high-risk behaviours', half of them agreed that persons who became infected through blood transfusion are more

Table 2 **Physicians' responses to knowledge items**

Item (correct answer)	Number	Respondents' answers (%)		
		Correct	Wrong	Do not know
Aetiology				
It is difficult to destroy HIV outside the human body (No)	333	78.1	16.5	5.4
Pathology and pathogenesis				
Higher anti-HIV antibody titre means more severe infection (No)	321	67.9	18.7	13.4
Epidemiology				
Mashhad is one of the most HIV-prevalent cities in Iran (No)	339	44.5	22.7	32.7
Transmission modes & risk factors				
The elderly have a lower risk of catching HIV infection (No)	340	30.3	61.8	7.9
Children who live in an AIDS patient's house have a higher risk of catching HIV infection (No)	339	47.8	48.7	3.5
How high is the risk of HIV transmission following skin puncture by a contaminated needle? (<%1)	337	39.2	46.9	13.9
Can the virus be transmitted by public lavatory? (No)	333	94.9	2.7	2.4
Can the virus be transmitted by tears? (No)	331	66.2	29.0	4.8
Can the virus be transmitted by saliva without any blood? (No)	334	62.9	34.7	2.4
Can the virus be transmitted by public swimming pools? (No)	335	89.0	6.6	4.5
Can the virus be transmitted by human bites? (Yes)	328	79.6	14.3	6.1
Can the virus be transmitted by kissing? (No)	330	90.6	7.6	1.8
Can the virus be transmitted by insect bites? (No)	331	74.0	21.5	4.5
Can the virus be transmitted by donated sperm? (Yes)	329	71.1	16.4	12.5
Clinical manifestation				
Most deaths among AIDS patients are direct consequences of infections other than HIV (Yes)	345	97.1	2.3	0.6
Persistent or frequent vulvovaginal candidiasis might be indicative of HIV infection (Yes)	336	83.0	12.5	4.5
Failure to thrive is a significant symptom of AIDS in infants (Yes)	333	48.3	32.1	19.5
The more severe clinical manifestations of primary HIV infection, the more accelerating the progression to AIDS disease (No)	333	33.6	55.3	11.1
Survival period for an HIV-infected person after beginning the AIDS stage is expected to be two years maximum (Yes)	335	33.1	56.1	10.7
How long is the incubation period of AIDS on average (the length time from initial infection to the development of disease)? (10 years)	340	54.7	42.1	3.2
Diagnosis and laboratory findings				
In children under the age of 18 months, serological tests for HIV are useless (Yes)	327	41.6	33.0	25.4
The CD4+ lymphocyte count is the best indicator of the immunological competency of the patients with HIV infection (Yes)	339	87.0	2.7	10.3
Which tests should be performed initially for suspected HIV infection? (HIV ELISA)	334	73.1	18.0	9.0
How long does it usually take from infection to appearance of anti-HIV antibodies in the circulation? (up to 6 months)	339	55.8	35.1	9.1
Definite criteria for diagnosis of HIV infection? (a positive ELISA test plus a positive Western blot test)	339	22.7	55.8	21.5
Monitoring measures in an HIV-infected patient? (chest X-ray, Pap smear and PPD test)	339	82.6	11.5	5.9
Diseases need to be tested for after diagnosis of HIV infection? (syphilis, hepatitis B, hepatitis C, tuberculosis, toxoplasmosis, and cervical cancer)	338	45.0	45.6	9.5
Management				
TB therapy is generally the same in the HIV-infected patient and in the HIV-negative patient (Yes)	336	52.4	39.3	8.3
Review intervals for a 25-year-old man who is HIV-positive but has no indication for antiviral treatment? (every 3–6 months)	333	69.7	11.7	18.6
How many classes of drugs are used commonly for initial HIV/AIDS therapy today? (three)	323	34.1	33.7	32.2
Prevention				
We can give MMR vaccine to HIV-positive infants without severe immune deficiency (Yes)	323	58.2	18.9	22.9
When should antiviral drugs be started in an HIV-infected mother's newborn? (after birth without performing a HIV test)	332	37.3	42.5	20.2
To what extent is proper condom usage effective in preventing transmission of HIV infection? (>%90)	337	70.6	21.4	8.0
What is the suggested contraception method in an HIV-positive married woman? (condoms with another method)	339	61.4	35.7	2.9
What are the recommendations for a young woman who is informed that her recent sexual partner is HIV-positive? (prophylaxis with antiviral treatment for a limited period)	328	20.1	73.2	6.7
What are the PPD test induration criteria to start TB prophylaxis in an HIV-positive patient who has reached the AIDS stage? (any induration)	330	23.6	57.6	18.8
When should an HIV test be requested in a sexual partner of an HIV-infected person? (at the time of referral, 3 months later and every 6 months)	330	28.8	63.3	7.9

ELISA=enzyme-linked immunosorbent assay; PPD=purified protein derivative; MMR=measles, mumps and rubella; TB=tuberculosis

worthy to care for than those infected by injecting drugs. Similarly, two-fifths of doctors affirmed that they sympathized less with people who were infected via extramarital sex. Table 3 shows replies to some of the questions on attitudes towards HIV/AIDS.

Notably, 49.2% of doctors had few concerns about occupational contact with HIV-positive patients, and 65% denied fear of acquiring infection while visiting an HIV-positive patient. The probability of HIV acquisition while working at an office was estimated to be low and very low by 88.5% of

Table 3 **Distribution of physicians' response to attitudes items**

Item	Number	Strongly agree	Agree	No opinion	Strongly disagree	Disagree
Physicians' attitudes towards HIV-positive people						
People became HIV-infected through blood transfusion are more worthy for care than those infected by injecting drug	340	30.3	17.9	6.5	8.5	37.1
I feel less compassion toward people who catch HIV infection due to sexual contacts out of marriage	338	19.2	17.5	14.5	14.2	34.6
Most of HIV-infected people have high-risk behaviours so it is just for them to catch AIDS	334	2.4	6.3	7.8	18.3	65.3
HIV-positive patients should be treated like others	342	83.9	11.1	2.3	0.9	1.8
HIV-positive patients have the right to receive similar health care like others	337	83.7	11.6	1.2	0.6	3.0
Health-care personnel authorities in caring HIV/AIDS patients						
If it was ethically approved I would prefer not to accept HIV-positive patients	339	7.4	11.8	10.6	17.7	52.5
Health-care personnel are permitted to ask for HIV tests without informing their patients	335	16.4	19.4	8.1	16.1	40.0
Health-care personnel are permitted to refuse HIV-positive patients admission to hospital	340	0.6	2.6	2.9	12.9	80.9
Patient's families should be informed of their HIV test result	336	54.5	22.0	3.6	9.5	10.4
HIV-infected physicians should be banned from practicing	336	2.4	8.0	9.5	17.6	62.5

the physicians. On the other hand, responses to the question 'what will you do if you are informed that the patient you are examining is HIV-positive?' showed only 61.1% of the physicians would continue the examination; 38% said they would examine the patient in a more limited way and avoid direct contact with the patient and 0.9% of the physicians chose to stop the examination altogether. Inquiring about their decision upon continuing dental care after understanding that their dentist was HIV-positive, 14.9% of the physicians would continue without any fear, while 6.6% claimed that they would react with fear and anxiety and 78.5% stated they would change their dentist.

DISCUSSION

Investigating GPs and specialists in private practice by a cluster-based random sampling, this study revealed that physicians were not well informed about HIV/AIDS. Alarmingly, this lack of knowledge was more evident in areas such as transmission routes, clinical and laboratory findings, prevention and management.

Previous studies in Iran about knowledge of health-care providers also showed low knowledge regarding HIV/AIDS.[5,7] Lack of knowledge had also been found in the other countries of the Middle East, and beyond.[12,20–23] A study by Khandwalla *et al.*[23], showed that both GPs and specialists in Pakistan had insufficient knowledge of sexually transmitted infections including HIV/AIDS, and suggested additional education in management and counselling to help prevent further spread. In contrast some studies in developed countries found high knowledge among GPs.[24]

Our study showed that the issue of transmission routes was one of the areas in which physicians had low knowledge. In our study, false transmission routes were mainly tears, saliva and insect bites, and only a few could correctly rank the risk of transmission of five different types of sexual contacts. Misconceptions on transmission modes have also been revealed in other studies.[20–22] Other health-care workers who are also engaged in the management of HIV/AIDS cases might have insufficient knowledge, as best shown by a survey of nurses in Shiraz, Iran in 2003. Most participants knew the main transmission routes (blood, semen and vaginal fluid), but they overestimated the role of other body fluids.[9] Similarly to our findings, Rosen *et al.*[25] demonstrated in 2004, that only 1.4% of Canadian health-care providers could closely estimate actual risk of HIV transmission after one act of unprotected vaginal intercourse with an infected man.

In this study, only one-third of the physicians had at least one HIV-positive patient, and this might partially explain the lack of knowledge. Brachman *et al.*[26] associated HIV/AIDS knowledge directly with the amount of previous contact with patients. An investigation in Massachusetts by Fournier *et al.*[27], in which 65% of the respondents reported having HIV patients in their practice, concluded that physicians with HIV patients learnt more about HIV care.

This study showed that physicians had some unfavourable attitudes towards HIV/AIDS. This was in contrast to a study on attitudes of health-care providers towards HIV/AIDS in Iran where positive attitudes were reported. In that study, among different health-care providers, however, physicians were not the group with the most favourable attitudes.[8]

Such negative attitudes might be a consequence of unconsciously associating HIV/AIDS with socially stigmatized and/or religious and legally forbidden behaviours such as promiscuity and drug abuse. Many of the respondents in this study believed that IDUs with HIV infection are less worthy to care and stated that they did not sympathize with HIV/AIDS patients who caught the infection through extramarital sex. In Iran, illicit drug use is a crime[28] and pre- or extramarital sex is banned; homosexuality (especially sex between men) is stigmatized. In a study in Tehran, the capital of Iran, about half of respondents stated that sexual intercourse before marriage is wrong and noted that premarital sex brings a bad reputation for a woman. Moreover, most agreed that homosexuals should be punished.[29] Negative attitudes towards IDUs and homosexuals have also been found in other studies.[12,30] In a national mailed survey on general internists, family physicians and GPs in the USA, 35% of respondents expressed feeling nervous among a group of homosexuals and 55% stated that they would be uncomfortable if they had patients who were IDUs in their practice.[30]

Anxiety about contracting the infection during medical practice is another aspect of attitudes that was evaluated in our study. This anxiety might be a direct consequence of

insufficient knowledge, especially about transmission routes. In our study, most of the respondents estimated that the risk of HIV acquisition is low while working in their office. However some declared concern about contracting infection upon visiting an HIV-positive patient. Similar findings were reported by another study in Iran. Evaluating dentists of Shiraz, it showed that most of the respondents had some level of discomfort about treating HIV/AIDS patients.[6] Fear of contracting the HIV infection from patients has been observed in physicians of other countries in the region.[13] In contrast, some studies had suggested that physicians in Western countries were rarely concerned about acquiring AIDS from a patient.[31,32]

Respecting patients' rights is one of the important aspects of managing HIV/AIDS. According to the results of this study, a considerable proportion of physicians did not believe in a patients' rights to be asked for permission and be informed them before requesting an HIV test. Some also disapproved of concealing the result of a patient's HIV test from their family. Disregarding patients' rights have also been shown by Messiah *et al*.[33] Conversely, results of the studies in developed countries confirmed that most practitioners informing patients and take consent before routine HIV testing and reporting the results to others, particularly the patient's family and sexual partners.[32,34]

Some unfavourable attitudes towards HIV/AIDS might be partly due to low knowledge. One study in the north-east of Iran has demonstrated that attitudes were significantly correlated with knowledge and people with less knowledge had worse attitudes towards HIV-positive individuals.[35] One reason that can explain knowledge deficiencies and unfavourable attitudes towards HIV/AIDS in Iranian physicians is inadequate education in college curricula and/or lack of postgraduate educational courses, as shown in our study and others.[36] Asai[37] emphasized that providing guidelines for primary care physicians of Japan to have a better approach to HIV/AIDS care by focusing primarily on treatment and effective prevention counselling. According to UNAIDS, Iran 'is moving from having a concentrated HIV epidemic among injecting drug users to a more generalized situation'.[38] It seems that a revision of HIV/AIDS education to medical trainees and practitioners is mandatory to improve knowledge and favourable attitudes, thus helping to prevent further progress of HIV/AIDS in the country.

Limitations

Physicians participating in this research were not asked to answer the questions immediately, thus it was possible to answer the questions using medical references, which could have affected the answer reliability. However, as questionnaires were sent anonymously and access to the results was not possible for anyone, it seems less likely that this occurred.

ACKNOWLEDGEMENTS

This study was conducted in the Research Center on HIV/AIDS, HTLV and Viral Hepatitis, Iranian Academic Center for Education, Culture & Research (ACECR), Mashhad Branch. Funding was supplied by the ACECR, Research and Technology Deputyship as well Mashhad Medical Council. Permission for submitting to this journal was formerly acquired. We appreciate Dr Farhad Fathimoghaddam's help in writing this paper and also thank all the practitioners who took part in this study by filling the questionnaire.

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(Accepted 28 November 2009)