

Original Article**The knowledge and attitudes of a female at-risk population towards the prevention of AIDS and sexually transmitted infections in Tehran**

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Abstract

BACKGROUND: The female at-risk population represents a subgroup that is both a crucial determining factor in acquired immune deficiency syndrome (AIDS) transmission and a gap in the existing literature in Iran. The objective of this study was to evaluate the level of sex workers' knowledge towards safe procedures of sexually transmitted infection and AIDS prevention as well as attitudes towards AIDS.

METHODS: A sample of 256 female sex workers working in Tehran was obtained by a variety of methods. Appropriate questions for the assessment of knowledge and attitude were developed based on previous studies.

RESULTS: The mean age of the subjects was 26.8 ± 6.1 years (ranging from 16 to 45). Methods of transmission were widely recognized, despite the exception that few realized oral (23.4%) and anal (44.9%) intercourse as methods of human immunodeficiency virus (HIV) transmission. Most subjects knew that AIDS currently has no cure (81.2%) and no vaccine (73.4%). Most also acknowledged that HIV is transmissible from people who do not know they are HIV positive (59.4%), proper condom use can reduce the possibility of infection (78.1%), and so can having a single sexual partner (68.8%). Of the participants, 43.4% knew that an HIV-positive person can seem perfectly healthy.

CONCLUSIONS: Knowledge towards sexually transmitted infections (STIs) and condom use is still inadequate, especially regarding risky behaviors such as anal sex, and attitudes are mainly negative. Identifying at-risk populations, HIV-positive sex workers, education and campaigns to change the attitudes towards AIDS should be regarded a high priority in Iran.

KEYWORDS: Sexual Behavior, Acquired Immunodeficiency Syndrome, Sexually Transmitted Infections, Sex Workers, Condoms.

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Studying the AIDS epidemic in Iran has always presented a challenge to health care planners and researchers. While intravenous (IV) drug use has been introduced as the primary route of AIDS transmission,¹ the lack of information surrounding sexual conduct in Iran has rendered these statistics unreliable.² The fact that the mere existence of prostitution and sexually transmitted infec-

tions (STIs) in Iran and other Islamic countries is considered taboo by both the government and the general population has provided a state of denial,³ referred to by some as a "health crisis behind the veil".⁴

Despite being prohibited in the religion of Islam, premarital and extramarital sexual relationships are by no means non-existent, and the scarce literature dedicated to sexual prac-

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tice in Iran confirms this. One study, demonstrated that 27.7% of Iranian boys aged 15-18 reported sexual experience in Tehran, and of the percentage having reported sexual experience, 71.7% claimed to have had multiple partner relations.⁵ Another study conducted on Tehran runaway girls and women seeking safe haven, reported that half had experienced sexual relationships and 40% had experienced their first sexual contact with someone other than their husband.⁶ The 2006 country progress report developed by the Iranian ministry of health and medical education shows that most indicators of knowledge and behavior concerning sexual practice were lacking national scale studies, and the studies referred to in the report were few, unintelligible, and extremely contradictory.⁷

Since the advent of the AIDS epidemic, worldwide programs and informational campaigns have been launched, creating an overall favorable awareness towards STIs. Existing programs have increased the use of condoms among sex workers and reduced rates of AIDS infection in this high-risk subgroup.⁸ Nonetheless, sex workers still play a fundamental role in heterosexual AIDS transmission,⁹ and the level of their knowledge and compliance to safe procedures is far from satisfactory.¹⁰

Studies conducted on various subgroups in Iran attempting to measure awareness towards STIs -specifically AIDS- have demonstrated reasonably high to moderate knowledge levels in the general population¹¹ and students.^{12,13} Only one of these studies included sexual practice; it revealed that 8% of university students had experienced premarital sex and 48% of them had used condoms.¹³ Studies that included specific target groups that play a prominent role in AIDS transmission, such as dentists and nurses, demonstrated a need for improvement.¹⁴⁻¹⁵

Sex workers represent a subgroup that is both a crucial element in AIDS transmission and a gap in the existing literature in Iran. This study was conducted to assess the knowledge and attitudes of this group towards STI/AIDS prevention.

Methods

This study was conducted in the Iranian capital city of Tehran. Various districts were tested to locate sex workers throughout the city. Five areas which were found to have the most sex workers included: one in the North, one in the city center, one in the West, one in the East, and one in the South of city. In addition to the city "hot spots", subjects were recruited from all districts and areas of Tehran to ensure a representative sample.

Subjects included all female persons of all ages willing to participate, who identified themselves as sex workers (willing to perform sexual acts for monetary compensation). Only those who did not complete the interview, for any given reason, were excluded from the study.

The study was a cross-sectional study. The sample size was estimated to be 256 persons. This sample was calculated with the assumption that 60% have adequate knowledge and acceptable practice towards AIDS and other STIs (based on previous studies, although figures were vaguely presented¹⁶); with a margin of error of 6% and 95% confidence interval.

The sampling method of choice for this study was initially intended to be a "Respondent Driven Sampling" (RDS) method, one of which the initial participants ("seeds") are asked to introduce further subjects and the "wave" propagates. However, after identifying seeds by a variety of methods, such as driving by common meeting places for sex workers in a vehicle, or contacting sex workers that have been previously identified, it was found that most were either reluctant to introduce new subjects, or were not part of a network. This phenomenon forced us to change the sampling technique into a simple convenience sampling method, where 60% of the cases were new seeds. The other 40% were introduced by the known cases, but were less than the number required to engage RDS analysis. Therefore, ordinary analysis was used to interpret the data.

It was initially intended that different locations and different methods be used to find the

initial seeds to engage a wider variety of sex workers of different socio-economical and personal backgrounds. However, after the sampling method was converted to simple convenience method, the diversity of the samples became more important than before. It had to be rationally ensured that the sample contained a reasonably proportionate number of sex workers of a certain socio-economic status.

Ethical clearance was provided by the Shahid Beheshti University of Medical Sciences Ethics Committee. Subjects were either identified on the streets (street walkers), or introduced by clients, as some of the sex workers (call girls) had a network of clients and were solely accessible via cell phone. The interviewer proceeded with the interviews, after obtaining written consent in informed consent forms.

Appropriate questions for the assessment of knowledge and attitudes were written based on previous studies. In addition, it was matched with the WHO standard questionnaire for HIV in female sex workers which ensured the validity and reliability of the results.¹⁷

These were asked of the subjects in an interview after identification. Data was entered in data collection sheets. The questionnaire was modified after receiving initial feedback from the first few subjects as a pilot test. Participants were offered a monetary fee equivalent to 20 USD (\$) for cooperation and 5\$ more for introducing new subjects for the study.

The data collected by the designated collection sheets were entered into a database using SPSS version 11.5 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were reported as means and standard deviations. Statistically significant differences were analyzed by chi-square test.

Results

A total of 432 female sex workers were identified, of which 256 (59.2%) accepted to participate in the study and were recruited for participation.

The mean age of the subjects was 26.8 ± 6.1

years (ranging from 16 to 45). More than half of the subjects were born in Tehran ($n = 138$; 53.9%) and spoke Farsi as their mother tongue ($n = 133$; 52.0%). The rest were from provinces all around the country. One-hundred and two subjects (39.8%) were never married, 89 (34.8%) were divorced, 39 (15.2%) widowed, and 18 (7.0%) married. The educational status of the women was: 21 (8.2%) elementary, 91 (35.5%) middle school, 68 (26.6%) high school drop-outs, and 76 (29.8%) had a high school diploma or higher.

The subjects were selected in a manner that all areas of the city were covered to a reasonably moderate extent; 25 (9.8%) sex workers worked in the city center, 28 (10.9%) in the North, 97 (37.9%) in the South, 59 (23.0%) in the West, 26 (10.2%) in the East, and 21 (8.2%) did not mention a specific area.

When asked to name the STIs they recognized, the most frequently named STI was AIDS with 90.6%, followed by hepatitis (51.6%), gonorrhoea (47.7%), syphilis (40.6%), warts (4.7%), herpes (3.9%), and scabies (3.1%). When asked how STIs could be prevented, 175 (68.3%) correctly mentioned condom use; reducing partners (38.6%), informing partners (18.1%), and incorrectly, OCPs (7.9%) were also mentioned as the method to reduce the risk of STIs.

Regarding the knowledge of the subjects, the methods of transmission known to the subjects are presented in table 1. In addition to these, most subjects knew that AIDS currently has no cure (81.2%) and no vaccine (73.4%), and cannot be prevented by using contraceptives (62.1%). Only 20.3% knew that there are steps an HIV-positive mother could take that could reduce the possibility of her fetus being afflicted with HIV. Most also acknowledged that HIV is transmissible from people who do not know they are HIV-positive (59.4%), proper condom use can reduce the possibility of infection (78.1%), and so can having a single sexual partner (68.8%). Only 43.4%, however, knew that an HIV-positive person can seem perfectly healthy. On the other hand, 87.5%

Table 1. Knowledge of routes of human immunodeficiency virus (HIV) transmission

HIV is transmissible by:	Yes	No	Do not know
Blood transfusion	216 (84.4%)	12 (4.7%)	28 (10.9%)
Mosquito bites	56 (21.9%)	136 (53.1%)	64 (25.0%)
Sharing food with an HIV-positive person	119 (46.5%)	107 (41.8%)	30 (11.7%)
Body tattoos	153 (59.8%)	65 (25.4%)	38 (14.8%)
Tattooing eyebrows	95 (37.1%)	105 (41.0%)	56 (21.9%)
Sharing a syringe with an HIV-positive person	242 (94.5%)	4 (1.6%)	10 (3.9%)
From women to men during sexual intercourse	226 (88.3%)	10 (3.9%)	20 (7.8%)
Kissing	50 (19.5%)	137 (53.5%)	69 (27.0%)
Coughing or sneezing	46 (18.0%)	145 (56.6%)	65 (25.4%)
Haircutting and shaving tools	160 (62.5%)	52 (20.3%)	44 (17.2%)
Dentistry tools	180 (70.3%)	34 (13.3%)	42 (16.4%)
Oral sexual intercourse	60 (23.4%)	156 (60.9%)	40 (15.6%)
Anal sexual intercourse	115 (44.9%)	83 (32.4%)	58 (22.7%)
Swimming pools	34 (13.3%)	166 (64.8%)	56 (21.9%)
Shaking hands	26 (10.2%)	204 (79.7%)	26 (10.2%)
From an HIV-positive mother to the fetus she bears	147 (57.4%)	28 (10.9%)	81 (31.6%)
Breastfeeding	71 (27.7%)	62 (24.2%)	123 (48.0%)
A sexual encounter that does not reach ejaculation	95 (37.1%)	60 (23.4%)	101 (39.5%)

recognized that sexual intercourse with drug addicts bears a high risk for HIV infection.

Measuring attitudes of the subjects towards HIV-positive persons, only 45.7% would behave the same with HIV-positive persons as with non-infected persons. As much as 54.3% believed that HIV-positive persons should be kept away from society, 72.3% thought they should have separate medical care centers, 47.3% said HIV-positive children should not be accepted in ordinary schools, and 51.2% thought that HIV-positive persons should not be let into universities. Only 29.3% would buy food from an HIV-positive person and 42.6% believed that HIV-positive persons should be introduced to the public, although 52.7% thought an HIV-positive teacher could continue teaching.

Most (85.2%) would be upset by the death of an AIDS patient, but only 53.5% would be upset if the patient was homosexual and 41.4% if the patient was a drug addict. A 92.2% were admittedly afraid of AIDS, and 80.1% knew that they were at risk for AIDS. A 65.2% would prefer dying over getting infected with HIV

and 85.8% would hide the fact if a family member were afflicted with HIV. HIV was related to a lack of ethic morals for 74.6% and a lack of religious morals for 63.7%.

Sex education was considered a necessity for 76.6%, 91.4% believed it should be included in the school curriculum, and 93.0% believed they needed more information about AIDS and sexually transmitted infections.

Discussion

The findings of the this study expressed a solid knowledge of STIs and AIDS among female sex workers in Tehran, but also a number of extremely important gaps which show that the knowledge was not completely adequate in all areas. The findings also demonstrated numerous similarities between the current study and the available literature.

The most comprehensive report on sex workers in Iran is the report by Madani for the Ministry of Health and Medical Education.¹⁶ This report revealed a number of demographics, including a mean age of 27.6 years, university education in 12.9%, and birthplace outside

Tehran in 43.1%. Surprisingly, 11.1% were married at the time of practicing prostitution. The residence of the sex workers in the study was evenly distributed throughout Tehran, but slightly more in the eastern and western parts of the city. Each sex worker was estimated to be active in this profession for a mean of 5.8 years. Most had heard of AIDS (97.5%), 18.6% believed that a healthy looking person could not be HIV-positive, and 12.7% believed that AIDS had a cure. Condom use was recognized as a preventive measure against AIDS by 65.3%, and 35.4% thought that having one sexual partner could be considered a preventive measure.

Demographic data shows similarities between the current study and that of Madani.¹⁶ The mean age, education, and birth place of the subjects was strikingly similar in the two studies. This can also confirm the sampling of the current study by both the fact that previous findings were repeated, and by the fact that the distribution of subjects was mentioned to be even around the different areas of the city in the Madani study.

The demographics in our study also demonstrated that the sex worker community in Tehran is not a highly educated group, only 29.8% had a high school diploma or higher. This shows that not only should educational messages be directed towards simple uncomplicated messages, but that the problem of awareness for sex workers would probably not be resolved by integrating sex education into high school education. Already, sex education is offered as a mandatory course in universities under the name of "family planning" for cultural reasons, a course that is not attended by most sex workers who do not hold university degrees.

Methods of transmission were recognized widely, despite some exceptions; as mentioned in the results fewer than expected realized oral (23.4%) and anal (44.9%) intercourse as the methods of HIV transmission. While many believe sharing food is a method of transmission (46.5%), many did not recognize eyebrow tattoos (37.1%) as a method of transmission. Such

items may require more attention in future awareness campaigns.

Despite this, most were afraid of contracting AIDS (92.2%) and acknowledged that they were at risk for infection (80.1%). Further investigations covering qualitative research to identify the gap between knowledge and practice would be highly useful to determine educational needs and interventions for such populations.

In addition, the attitude of subjects towards HIV-positive persons was surprisingly highly negative. This may be due to the lack of advertisement campaigns in this regard, until recently. Investing in public awareness campaigns is a need that is felt throughout the country. Such campaigns, if correctly carried out, can influence these issues profoundly and improve conditions for existing HIV-positive persons. Other studies had previously reported very negative attitudes in the general population;¹⁸⁻²⁰ however, attitude measurements can be largely dependent on the researchers' perspectives and study designs, and at least one study reported positive attitudes towards AIDS patients, although the provided statements in this study do not appear to be neutral in tone.¹¹

Main achievements included the identification and successful communication established with the subjects. This step was anticipated to be confronted with more problems than it actually was. The interviewers were capable and made communication with the subjects efficiently to recruit their cooperation. The only unpredictable factor was the fact that the subjects were more easily found in isolation than by referral, which resulted in a change in the sampling structure.

Overall, the findings mirrored the few reliable previous studies to a large extent. The proportion of women that recognized that AIDS currently has no cure was similar to the figure by Madani.¹⁶ Familiarity with STIs was somewhat similar to the findings of the study by Ramezani and Malek-Afzali.²¹ The number of subjects who knew that an apparently healthy person could be HIV-positive in our

study, and studies by Hajiabdolbaghi et al.,⁶ Madani,¹⁶ and Ramezani and Malek-Afzali²¹ was 43.3%, 22%, 18.6%, and 34% respectively, all of which were studies conducted during the past four years.

In the end, this study has provided a large amount of data regarding the epidemiology and demographics of the dissemination of information on AIDS and STIs among the sex worker population, a population which is hard to reach and not much is known about the population in itself. This can help us open the way for intervention. Perhaps the gaps in our information can be made smaller by conducting qualitative research to find in-depth reasons for certain risky behaviors.

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Conflict of Interests

Authors have no conflict of interests.

Authors' Contributions

AAK was the manager of the entire project and recipient of the funding grants; AR was responsible for drafting the initial design proposal, reports, and manuscripts; AA was the statistical consultant for design and analysis; MRS was the public health and methodology consultant; MN was the infectious and tropical disease consultant; and AS was responsible for participant affairs. However, all authors played active parts in each stage of the study and roles overlapped in all domains.

References

1. Disease Control, Office of the Deputy for Public Health, Ministry of Health and Medical Education of the IR Iran. HIV/AIDS in Iran (Cumulative Statistics). Tehran: Ministry of Health and Medical Education of the IR Iran; 2009.
2. Gheiratmand R, Navipour R, Mohebbi MR, Mallik AK. Uncertainty on the number of HIV/AIDS patients: our experience in Iran. *Sex Transm Infect* 2005; 81(3): 279-80.
3. Mohebbi MR. Female sex workers and fear of stigmatisation. *Sex Transm Infect* 2005; 81(2): 180-1.
4. Obermeyer CM. HIV in the Middle East. *BMJ* 2006; 333(7573): 851-4.
5. Mohammad K, Farahani FK, Mohammadi MR, Alikhani S, Zare M, Tehrani FR, et al. Sexual risk-taking behaviors among boys aged 15-18 years in Tehran. *J Adolesc Health* 2007; 41(4): 407-14.
6. Hajiabdolbaghi M, Razani N, Karami N, Kheirandish P, Mohraz M, Rasoolinejad M, et al. Insights from a survey of sexual behavior among a group of at-risk women in Tehran, Iran, 2006. *AIDS Educ Prev* 2007; 19(6): 519-30.
7. Center for Disease Control, Office of the Deputy for Public Health, Ministry of Health and Medical Education of the IR Iran. Islamic Republic of Iran Country Report on Monitoring of the United Nations General Assembly Special Session on HIV and AIDS. Tehran: Ministry of Health and Medical Education of the IR Iran; 2006.
8. Vuylsteke BL, Ghys PD, Traore M, Konan Y, Mah-Bi G, Maurice C, et al. HIV prevalence and risk behavior among clients of female sex workers in Abidjan, Cote d'Ivoire. *AIDS* 2003; 17(11): 1691-4.

9. Gangopadhyay DN, Chanda M, Sarkar K, Niyogi SK, Chakraborty S, Saha MK, et al. Evaluation of sexually transmitted diseases/human immunodeficiency virus intervention programs for sex workers in Calcutta, India. *Sex Transm Dis* 2005; 32(11): 680-4.
10. Fornasa CV, Gai F, Tarantello M, Gallina P. Knowledge of sexually transmitted diseases and condom use among female street sex workers in Padua. *Acta Dermatovenerol Alp Panonica Adriat* 2005; 14(3): 107-10.
11. Montazeri A. AIDS knowledge and attitudes in Iran: results from a population-based survey in Tehran. *Patient Educ Couns* 2005; 57(2): 199-203.
12. Tavvosi A, Zaferani A, Enzevaei A, Tajik P, Ahmadinezhad Z. Knowledge and attitude towards HIV/AIDS among Iranian students. *BMC Public Health* 2004; 4: 17.
13. Simbar M, Tehrani FR, Hashemi Z. Reproductive health knowledge, attitudes and practices of Iranian college students. *East Mediterr Health J* 2005; 11(5-6): 888-97.
14. Askarian M, Mirzaei K, Cookson B. Knowledge, attitudes, and practice of Iranian dentists with regard to HIV-related disease. *Infect Control Hosp Epidemiol* 2007; 28(1): 83-7.
15. Askarian M, Memish ZA, Khan AA. Knowledge, practice, and attitude among Iranian nurses, midwives, and students regarding standard isolation precautions. *Infect Control Hosp Epidemiol* 2007; 28(2): 241-4.
16. Madani S. A Quick Report on Prostitution in Tehran with a Focus on AIDS-Related Risky Behavior. Tehran: Ministry of Health and Medical Education of the IR Iran; 2007.
17. Amon J, Brown T, Hogle J, MacNeil J, Magnani R, Mills S, et al. Behavioral Surveillance Surveys (BSS): Guidelines for Repeated Behavioral Surveys in Populations at Risk of HIV. Durham: Family Health International (FHI); 2000.
18. Feizzadeh A, Nedjat S, Asghari S, Keshtkar A, Heshmat R, Setayesh H, et al. Evidence-based approach to HIV/AIDS policy and research prioritization in the Islamic Republic of Iran. *East Mediterr Health J* 2010; 16(3): 259-65.
19. Hedayati-Moghaddam MR. Knowledge of and attitudes towards HIV/AIDS in Mashhad, Islamic Republic of Iran. *East Mediterr Health J* 2008; 14(6): 1321-32.
20. Ghabili K, Shoja MM, Kamran P. The Iranian female high school students' attitude towards people with HIV/AIDS: a cross-sectional study. *AIDS Res Ther* 2008; 5: 15.
21. Ramezani TF, Malek-Afzali H. Knowledge, attitudes and practices concerning HIV/AIDS among Iranian at-risk sub-populations. *East Mediterr Health J* 2008; 14(1): 142-56.