



Knowledge Regarding Sexually Transmitted Infections and Socio-Demographic Predictors in Women with High-Risk Sexual Behaviors

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Abstract

Background: Given the prevalence of high-risk behaviors among various sections of a society, prostitution is considered one of the most important current problems.

Objectives: The present study was conducted to determine the awareness of known women with high-risk sexual status about sexually transmitted infections (STIs) and their individual-social predictors in Kermanshah, Iran, in 2015.

Methods: This cross-sectional study was done on 173 prostitutes. All eligible female prostitutes who had records at the Department of Welfare, the health centers, and the drug rehabilitation centers were selected by convenience sampling. Street prostitutes were also selected by snowball sampling method. Socio-demographic and knowledge questionnaires were used to collect data. The data were analyzed by using an independent *t* test, one-way ANOVA test, and multivariate linear regression model.

Results: The mean (SD) score of knowledge was 62.1 (18.2) within the acquirable score range of zero to 100. According to the multivariate linear regression model, variables including duration of staying at this job, education level, husband's education, father's job, number of children, age at the first sexual activity, and the ways of supplying condoms were knowledge predictors while adjusting other variables.

Conclusions: Educational planning should include all age groups from all social and economic classes. Identifying and focusing on the variables of knowledge can improve the knowledge of women about STIs.

Keywords: Prostitute, Sexually Transmitted Diseases, Knowledge, Sex Workers

1. Background

One of the social problems that can be considered as a social harm is social deviance, which has a broad conceptual scope. In our culture, rape, juvenile delinquency, homosexuality, drug addiction, prostitution, etc. are among the social deviances (1). Prostitution is defined as a business with engagement in sexual relations in order to earn money (2). Infections are considered as the serious health problems in the world, which affect the lives of women, men, and their family and social relationships. Infections can be associated with many consequences including infertility, ectopic pregnancy, chronic pelvic pains, miscarriage, and increased risk of HIV infection (3). Sexually trans-

mitted infections (STIs) are a public health problem in most countries, especially developing countries; and the younger people are more likely to become infected with them (4). They are defined as a type of infections that are transmitted from one person to another during sex (5). STIs are transmitted by viruses, bacteria, and parasites through sex with an infected person. There are more than 30 pathogens known to be transmitted sexually (6). Many of them are preventable and treatable, but some cannot be cured (7). The highest prevalence of STIs is observed in people with the age range of 15 to 49 years that are known as the sexually active group (8). People that have multiple sexual partners, have more than one sexual partner at the same time, or are involved in sexual networks, includ-

ing sex workers, have the highest rate of STIs (9). Starting sex at lower ages leads to the increased genital infection (10). Risk behaviors such as unprotected sex, multiple sexual partners, not using or incorrect use of condoms, drug abuse, and the poor health of adolescents and young people put individuals at the highest risk for HIV and other STDs (11). Studies show that 30 - 60% of people who are sexually active possibly become infected during sexual life (4). It seems this amount is more in young people than in the elderly (12). Female prostitutes because of having many sexual partners and making frequent unprotected sexual intercourse are more at risk for STIs (13). Sexual behaviors of people in every area depend on their culture and religion and making a change in sexual behaviors is an important issue for the control of STDs because sex is a very personal subject and talking about it is not easy (14). In developing countries, STIs are associated with many side effects and they are rapidly spreading around the world, especially in the least developed countries (15, 16). Nevertheless, limited effort has been done to control and reduce it.

The best way to prevent infections is to have only one single healthy sexual partner, correct and consistent use of condoms, delayed age of the onset of sexual activity, and having regular examinations (15, 17). Studies conducted in many countries have shown that nowadays, teenagers are experiencing premature puberty compared to the previous generations; as a result, they start sex at younger ages, and consequently experience unplanned early pregnancy, unwanted and unsafe abortions, and STIs (11).

Any plan for health improvement among individuals needs to know their level of knowledge, attitude, and practice. Before the implementation of public health policies for the prevention of HIV, obtaining information about knowledge, attitudes, and behaviors regarding HIV and other STDs and sexual behaviors in society is vital. Therefore, the current study was conducted to determine the awareness of known women with high-risk sexual behaviors regarding STIs and their socio-demographic predictors in Kermanshah, Iran, in 2015.

2. Methods

2.1. Participants and Setting

The present study is a cross-sectional research performed on 173 female prostitutes after obtaining permission from the Ethics Committee of Tabriz University of Medical Sciences (ethics code: 139430). Eligible women were chosen by a convenience sampling method based on the records of the Social Welfare Department, health care centers, and addiction treatment centers. Furthermore, street prostitutes were selected through a snowball method in Kermanshah, Iran, in 2015.

The criteria for inclusion were women with multiple sexual partners, reading and writing literacy, willingness to participate in the research, and an age of 15 to 49 while the criterion for exclusion included the withdrawal of a person from the study.

The present study was a part of a larger research in which the sample size was estimated according to the variables of knowledge and attitude. The sample size was determined by Equation 1, using Ramezani Tehrani and Malek-Afzali study on knowledge and considering a confidence interval of 95%, a significance level of 5%, $m = 4.54$, $SD = 3.05$, and d (precision) = 0.1 (18). It was also estimated based on the attitude variable in another study (19). Since the estimated sample size was high based on the knowledge parameter, the last sample size was determined to include 173 subjects.

$$n = \frac{z_{1-\frac{\alpha}{2}}^2 \delta^2}{d^2} \quad (1)$$

2.2. Sampling

First, a list of all known women with sexual risk behaviors recorded in the social welfare office, office buildings, health care centers, and addiction treatment centers was prepared. Their mobile phone numbers were provided through their records. Street prostitutes were identified by the snowball method (a method of sampling in which a unit of the population is selected and asked to introduce more units). Then, the researcher called them and while explaining the purpose of the study, asked them to refer to the given centers. At the briefing, all participants were first informed about the objectives and the procedure of the project and were evaluated in terms of basic information and inclusion criteria. Finally, the eligible women were enrolled after signing informed consent forms.

2.3. Data Collection

The data collection tools comprised two questionnaires: knowledge regarding STIs and demographic characteristics. The demographic questionnaire included questions about age, education level, family's income, marital status, father's occupation and education, husband's occupation and education, mothers' occupation and education, the numbers of marriages and children, the age at the first illegal sexual intercourse, the age at entry into the sexual activity, the duration of staying at this job, a history of sexual abuse in childhood, smoking history, a history of sexual violence, condom use in clients, clients type, employment status, reuse of condoms, places of supplying condoms, non-paying clients, ways of access to clients, and usual working times.

The questionnaire of knowledge regarding STIs had 39 items with three choices including true (score = 1), false, and I don't know (score = 0). The questionnaire was prepared by Farshbaf-Khalili et al. in 2014 and its validity was confirmed by content validity index (CVI) and content validity ratio (CVR) of 0.72 and 0.81, respectively (20).

The reliability of the questionnaire was determined by the intra-class correlation coefficient (ICC) of 0.98 (0.99 - 1.0) with a 95% confidence interval. The range of scores is 0 to 100 and the higher scores indicate better knowledge. The questionnaires were completed by the individuals after being guided individually by the researcher. In case of a problem in completing the questionnaires, explanations were provided by the researcher. In order to keep the information confidential, the questionnaires were coded without mentioning any name and surname.

2.4. Data Analysis

To describe the demographic characteristics and knowledge of the subjects, descriptive statistics including frequency, percentage, mean, and standard deviation were used. The quantitative data were normally distributed. In addition, independent *t* test and one-way ANOVA were used to examine the relationship between socio-demographic characteristics and knowledge. Then, to assess the impact of the independent variables (socio-demographic characteristics) on the dependent variable (knowledge), the multivariate linear regression model with a backward strategy was used. All variables with $P < 0.2$ based on bivariate tests were included in the multivariate linear regression model. Before multivariate analysis, the regression assumptions of normality of residuals, homogeneity of residual variances, co-linearity, distortion of data, and independence of residues were evaluated. All analyses were performed by using SPSS version 21 software.

3. Results

A total of 173 prostitutes were enrolled in the study. Socio-demographic characteristics and the history of sexual behaviors are indicated in Tables 1 and 2.

The mean (SD) score of knowledge was 62.1 (18.2) within the attainable range of zero to 100. According to the questions of the knowledge questionnaire, the most correct answer (94.2%) was related to the question on the prevention of sexually transmitted diseases by using condoms while the least correct answer (7.0%) was related to the question on the risk of transmission of HIV infection in men and women with unprotected vaginal sex. In addition, 7.6% answered correctly to the question on the prevention of HPV via the use of the vaccine.

Based on the one-way ANOVA test outputs, there was a significant correlation between knowledge and the number of dependents, education level, the number of children, father's education and job, maternal education, family status, and the number of family members ($P < 0.05$) (Table 1).

One-way ANOVA and independent *t* tests showed that there was a significant correlation between knowledge and the duration of staying at this job, client type, employment status, a history of house escape, the daily number of sexual intercourse, weekly income, and the ways of supplying condoms ($P < 0.05$) (Table 2).

Based on the multivariate linear regression, father's job, husband's education, duration of staying at this job, the number of children, the age at the first sexual activity, and places of supplying condoms were the predictors of knowledge and explained 36.1% of the variance in the overall score of knowledge of women with high-risk sexual behaviors (Table 3).

4. Discussion

The present study showed that the mean (standard deviation) age of the participants was 30.3 (7.5), the frequent first illegitimate sexual activity was at the age of 18 to 20, and prostitution was common between 20 to 30 years of age. This implies that there is a narrow interval between the first illegal sexual contact and the beginning of the sexual activity. In this study, 67.3% of the cases had experienced sexual abuse during their childhood and this could be taken as a major health risk for the entry to prostitution.

In the study by Sharafatipour in Tehran, Iran, the most common age of the first illegal sexual contact was 13 - 14 and 74.6% of the cases had experienced the first illegal sexual contact before 18 (21). Bahari and Golshan Fomani in a study in several cities of Iran showed that the highest frequency was associated with the age range of 14 to 18 (22). The above-mentioned studies disagree with ours.

This study showed that the mean knowledge score was not good (62.1 out of 100). A study by Samkange-Zeeb et al. was conducted to review the papers related to reproductive tract infections between 1990 and 2010 in English among adolescents in European countries. It showed knowledge about reproductive tract infections, except for HIV/AIDS, was reported up to 90 percent, which was moderate or lower than moderate (4) and was consistent with the results of this study. This indicates that genital infections, in addition to being one of the most important health problems in developing countries, are a part of health priorities in developed countries. Informing people about reproductive tract infections through mass media and by health educators with midwives, as the most important

Table 1. Association of Demographic Characteristics with Knowledge Regarding STIs in Prostitutes in Kermanshah-Iran (N = 173)

| Demographic Characteristics | N | Mean (SD) | P Value | Demographic Characteristics | N | Mean (SD) | P Value |
|-----------------------------|-----|-------------|---------|---------------------------------------|----|-------------|---------|
| Age group | | | 0.344 | Father's education | | | < 0.001 |
| ≤ 20 | 20 | 63.9 (12.3) | | Illiterate | 18 | 53.5 (21.1) | |
| 21 - 30 | 77 | 63.8 (18.5) | | Primary school | 36 | 50.7 (19.0) | |
| ≥ 31 | 76 | 59.8 (19.2) | | Secondary school | 40 | 67.7 (16.9) | |
| Marital status | | | 0.297 | High school or diploma | 64 | 65.2 (15.5) | |
| Single | 35 | 64.4 (14.8) | | Academic | 15 | 71.1 (11.0) | |
| Married | 43 | 58.0 (19.3) | | Education level | | | < 0.001 |
| Divorced | 46 | 65.0 (17.0) | | Primary or secondary school | 33 | 48.3 (22.5) | |
| Widow | 34 | 59.9 (21.8) | | High school | 23 | 55.4 (16.2) | |
| Concubine | 11 | 67.5 (10.9) | | Diploma | 70 | 62.8 (14.0) | |
| Husband's education | | | 0.135 | Academic | 47 | 63.9 (16.2) | |
| Primary or secondary school | 8 | 51.7 (19.1) | | Number of children^a | | | 0.001 |
| High school or diploma | 33 | 61.8 (19.0) | | 0 | 83 | 64.8 (17.3) | |
| Academic | 13 | 63.5 (14.3) | | 1 - 2 | 42 | 58.8 (20.1) | |
| Husband's job | | | 0.415 | 2 or more | 9 | 41.6 (18.4) | |
| Unemployed | 18 | 59.8 (17.3) | | Father's job | | | 0.013 |
| Worker | 18 | 53.5 (23.1) | | Unemployed | 16 | 52.4 (18.1) | |
| Employee | 9 | 62.6 (13.3) | | Worker | 58 | 60.7 (20.0) | |
| Self-employed | 9 | 64.9 (12.6) | | Employee | 49 | 68.2 (14.6) | |
| Occupation of mother | | | 0.785 | Self-employed | 50 | 60.7 (17.8) | |
| Housewife | 131 | 61.8 (17.6) | | Number of marriages | | | 0.343 |
| Employee | 42 | 62.8 (20.4) | | 1 | 89 | 62.6 (18.8) | |
| Maternal education | | | 0.011 | 2 or more | 48 | 59.0 (19.1) | |
| Illiterate | 29 | 56.4 (18.7) | | Family income | | | 0.457 |
| Primary school | 67 | 58.3 (21.0) | | Inadequate | 91 | 61.1 (20.3) | |
| Secondary school | 22 | 68.4 (14.0) | | Less than adequate | 43 | 61.1 (17.5) | |
| High school or diploma | 43 | 66.4 (14.3) | | Adequate | 38 | 65.3 (13.3) | |
| Academic | 12 | 69.4 (11.1) | | | | | |

^a Not including single people.

ones, should be initiated from adolescence and at schools. In addition to training about the methods of prevention of reproductive tract infections, the ways of transmission prevention should be taught to the community.

Our results showed that by separating the knowledge questions related to the infection of genital warts (HPV), the knowledge score of studied women was high about other questions of STIs but the knowledge level was low about the symptoms, treatment, and transmission ways of HPV. In a study by Bakhtiari and Hajian in Babol, Iran, it was shown that the only sexually transmitted disease that was

unknown for women was genital warts that devoted the most incorrect answers to the disease transmission ways, complications, and prevention (23). Our results are consistent with the above study and the unfamiliarity with genital warts disease may be because the HPV is new and is the product of modern sexual behaviors, social wide changes, and pattern changes and thus, there is less training about HPV at the community level.

The results of the study showed that with increasing the education level of the self and the husband and father's occupation, the score of knowledge increased, as well. The

Table 2. Association of Some Variables with Knowledge in Prostitutes in Kermanshah, Iran (N = 173)

| Characteristics | N | Mean (SD) | P Value | Characteristics | N | Mean (SD) | P Value |
|--|-----|-------------|---------|--|-----|-------------|---------|
| Age at the first sexual activity, y | | | 0.103 | Age at entry into sexual activity, y | | | 0.623 |
| < 15 | 3 | 65.8 (20.7) | | < 20 | 19 | 63.2 (14.0) | |
| 15 - 17 | 50 | 58.7 (20.0) | | 20 - 30 | 147 | 62.2 (18.0) | |
| 18 - 20 | 76 | 60.6 (17.8) | | 31 - 40 | 6 | 55.1 (35.1) | |
| 21 - 23 | 33 | 69.3 (15.7) | | Usual working time | | | 0.505 |
| > 23 | 10 | 64.4 (17.2) | | Morning | 72 | 61.4 (16.8) | |
| Duration of staying at this job, y | | | 0.002 | Afternoon | 22 | 57.3 (22.4) | |
| < 1 | 21 | 69.4 (14.4) | | Evening | 10 | 58.9 (20.7) | |
| 2 | 26 | 69.1 (15.3) | | Morning and evening | 42 | 65.4 (18.2) | |
| 3 | 19 | 65.0 (9.7) | | During the day | 25 | 62.8 (17.7) | |
| 4 | 12 | 69.4 (12.6) | | History of sexual abuse in childhood | | | 0.686 |
| > 4 | 94 | 56.9 (20.2) | | Yes | 115 | 61.6 (19.9) | |
| Reuse of condoms | | | 0.986 | No | 56 | 62.7 (14.4) | |
| Yes | 4 | 61.5 (35.8) | | Sexual violence during the relationship | | | 0.068 |
| No | 154 | 61.1 (17.4) | | Yes | 143 | 63.1 (18.0) | |
| History of smoking | | | 0.484 | No | 28 | 56.2 (19.0) | |
| Yes | 70 | 63.1 (17.4) | | Condom use by clients | | | 0.100 |
| No | 101 | 61.1 (18.9) | | All times | 153 | 61.4 (17.8) | |
| Ways of access to clients | | | 0.161 | Occasionally | 17 | 69.0 (19.6) | |
| Tel and internet | 23 | 66.9 (17.6) | | Ways of supplying condoms | | | 0.018 |
| Street, friends, etc. | 139 | 61.2 (18.3) | | Clients | 50 | 54.9 (19.0) | |
| Employment status | | | 0.003 | Pharmacies | 69 | 64.6 (16.3) | |
| Group | 30 | 50.3 (23.2) | | Healthcare centers | 33 | 64.1 (18.2) | |
| Individual | 140 | 64.4 (16.1) | | All cases | 6 | 57.2 (11.4) | |
| Client type | | | 0.001 | Non-paying clients | | | 0.213 |
| Permanent | 56 | 68.4 (16.3) | | Yes | 34 | 65.5 (15.3) | |
| Permanent and temporary | 115 | 58.8 (18.4) | | No | 136 | 61.1 (18.9) | |

duration of staying at this job, education level, husband's education, father's job, number of children, age at the first sexual activity, and places of supplying condoms were the predictors of knowledge by adjusting other variables.

The study of Bakhtiari and Hajian in Babol, Iran, showed that knowledge about sexually transmitted diseases was higher in married women with lower ages and with higher education levels (23). In the study of Hadi and Parveen in Bangladesh on women, there was a significant association between education level and knowledge (24). Another study by Stone et al. in Nepal showed such a relationship (25) that is consistent with the results of our study. The study of Abedian and Dormohammadi in Mashhad showed with increasing the age, the knowledge level would increase, but there was no relationship between

knowledge and education of the self and the husband (26). The study of Etemad et al. in Gorgan, Iran, showed that individuals with higher ages and education levels had better knowledge about the transmission of sexually transmitted diseases (19). The results of our study were not consistent with those of the above studies, which can be due to the lower age of entry to this job and earlier access of the youth to the virtual world and getting information from this source.

The results of the present study showed that the knowledge level of women who had educated parents was higher. The study of Burazeri et al. on 729 students showed that parent's higher education and living in urban areas had a strong association with better knowledge (27). Our results are consistent with those of the above study, imply-

Table 3. Demographic Predictors of Knowledge in Prostitutes (N = 173)^a

| Variable | B (95% CI) ^b | P Value |
|---|-------------------------|---------|
| Education level | | |
| Academic | Ref | |
| Primary or secondary school | -17.3 (-35.1 to 0.5) | 0.057 |
| High school | -11.7 (-35.2 to 11.6) | 0.313 |
| Diploma | -3.4 (-19.4 to 12.6) | 0.669 |
| Father's job | | |
| Unemployed | Ref | |
| Worker | 10.6 (-27.2 to 5.8) | 0.198 |
| Employee | 14.5 (-37.7 to 8.5) | 0.208 |
| Non-governmental | 24.5 (-44.8 to -4.1) | 0.020 |
| Husband's education | | |
| Academic | Ref | |
| Lower than high school | -21.7 (-42.0 to -0.7) | 0.043 |
| Diploma | -9.9 (-25.0 to 5.1) | 0.180 |
| Places of supplying condoms | | |
| All below cases | Ref | |
| Clients | -2.3 (-23.3 to 18.7) | 0.822 |
| Pharmacies | 9.5 (-12.5 to 31.5) | 0.387 |
| Health care centers | 9.9 (-12.5 to 32.3) | 0.375 |
| Number of children | | |
| 2 or more | Ref | |
| 1-2 | 1.8 (-15.7 to 19.4) | 0.830 |
| 0 | 11.5 (-3.1 to 26.2) | 0.120 |
| Duration of staying at this job, y | | |
| > 4 | Ref | |
| < 1 | 9.8 (-18.1 to 37.8) | 0.480 |
| 2 | 20.0 (2.6 to 37.5) | 0.026 |
| 3 | 7.0 (-8.5 to 22.6) | 0.362 |
| 4 | 0.3 (-19.9 to -20.6) | 0.972 |
| Age at entry into sexual activity, y | | |
| > 23 | Ref | |
| < 15 | 27.4 (-10.6 to 65.4) | 0.152 |
| 15-17 | -0.6 (-26.8 to 25.4) | 0.957 |
| 18-20 | 3.6 (-19.2 to 26.5) | 0.744 |
| 21-23 | -18.6 (-42.1 to 4.9) | 0.117 |

^a Adjusted R² = 36.1%.^b 95% CI = 95% confidence interval.

ing that the increase of education level and parent's knowledge could play an important role in motivating and promoting information and knowledge in children and living in urban areas provides the possibility of education and

other possibilities.

The study of Arabi et al. on high school students in Bonab, Iran, showed knowledge and attitude about HIV decreased with having an unemployed father (28). The study of Shojaeizadeh et al. on high school students in Faruj, Iran, showed that an employed father increased knowledge about AIDS (29). The results of the above studies were not consistent with that of the current study and this difference may be due to a difference in the research population.

The study of Ostovar et al. on all women of reproductive age in Andimeshk, Iran, showed that women whose husbands had higher education were more knowledgeable toward sexually transmitted diseases and AIDS (30). Our results are consistent with that of the above study.

Among the limitations of this study is the sampling of prostitutes in Kermanshah. Thus, the generalization to other cities is limited. The other limitation of this study includes the possible lack of correct information recorded by participants due to the nature of the questions. However, this limitation was partially controlled by emphasizing the confidentiality of information and the lack of inclusion of participants' names in the questionnaire. The present study used a convenience sampling method that may reduce the generalizability of the results. It is suggested that this study is done with a larger sample size and in in-prison prostitutes and in other cities simultaneously. In addition, similar studies are conducted on other groups of society, especially at an earlier age, in order to prevent risky behaviors, especially in adolescents and young adults.

4.1. Conclusion

The results of the study showed that knowledge regarding STIs in women with high-risk sexual behaviors was not good but moderate. Knowledge increased with father's occupation and education of the self and the husband. It seems job creation and paying more attention to the employment status of the individuals and the increasing level of education are effective in promoting knowledge. Educational planning for all age groups from all social and economic classes is necessary. The knowledge of women about STIs can be promoted through identifying and focusing on the predictors of knowledge.

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Footnotes

Author Contributions: Study concept and design: Tayebeh Azadi Miankouhi, Jamileh Malakouti, Azizeh Farshbaf-Khalili; analysis and interpretation of data: Tayebeh Azadi Miankouhi, Mojgan Mirghafourvand, Azizeh Farshbaf-Khalili, Jamileh Malakouti; drafting of the manuscript: Tayebeh Azadi Miankouhi; critical revision of the manuscript for important intellectual content: Azizeh Farshbaf-Khalili.

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