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Mental Health and HIV-Related High-Risk Behaviors Among Female Sex Workers

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Background: Psychological problems have significant associations with HIV-related high-risk behaviors among female sex workers (FSWs).

Objectives: The present study aimed to investigate the relationship between mental health and high-risk behaviors among FSWs in Shiraz, Iran.

Patients and Methods: This cross-sectional study, conducted from October 2011 to May 2012, used a convenience sampling method to recruit 125 FSWs and 125 control women. After providing informed consent, each participant completed a validated questionnaire (SCL-90-R and high-risk behaviors).

Results: In comparison to the control group, the mean age at first sexual relationship was lower among sex workers, and most of them (80.4%) had not used condoms in their most recent sexual intercourse. The mean scores on all subscales of the SCL-90-R were lower in the control group ($P < 0.003$), whereas psychological symptoms were significantly more prevalent among FSWs. A significant inverse relationship was found between global severity indexes (GSR) scores and use of condom in the most recent sexual intercourse.

Conclusions: Considering the association of high-risk behaviors with lower mental health among FSW, psychological interventions are needed in order to prevent high-risk behaviors and HIV transmission.

Keywords: Mental Health; Dangerous Behavior; Sex Workers; Iran

1. Background

According to the United Nations Programme on HIV and AIDS (UNAIDS) global report published for the World AIDS Day 2012, about 34 (31.4-35.9) million people are living with HIV and 2.5 (2.1-2.8) million people became newly infected with HIV at the end of 2011 (1). A large number of the newly infected individuals are women and persons younger than 30 years of age in any one of high-risk groups such as injecting drug users, sex workers, and men who have sex with men (MSM) (2). According to the Iranian Ministry of Health, about 23000 cases of HIV/AIDS had been recorded as of November 2011 (3).

In spite of HIV epidemic, particularly among high-risk groups, evidence shows a change in the route of infection transmission from injection to sexual relationships (4). It is estimated that there are 30000-60000 female sex workers (FSWs) in Iran (5). Because, sex work is considered a religious taboo by both the government and most members of the society in some countries, including Iran, this issue as well as the associated burden of sexually transmitted diseases has been neglected along with any documented report of HIV infection prevalence among FSWs in Iran. drug Injection and sexual relationship are considered as the two main routes of HIV transmission and the lack of current information regarding clandestine networks of sex workers in Iran has made it difficult to obtain accurate information about this group and other at-risk groups (6). In general, female sex workers are considered one of the main sources of HIV transmission and sexually transmitted diseases who could transmit the infections to their clients and indirectly to the general population (7).

Since the worldwide spread of AIDS was identified as a health crisis, various studies have been conducted on the epidemiological characteristics of this disease. Some studies have investigated the factors associated with high-risk behaviors leading to HIV transmission in specific populations. Aggleton et al. identified individual and social characteristics in high-risk behaviors related to the prevalence of HIV (8). According to Marks et al. most of the theories of high-risk behaviors emphasize the mental background of the behavior, and note that the patients' emotional status, which can involve negative emotions and depression, is associated with unsafe sexual behaviors (9). The results of one study documented a relation between high-risk behaviors and emotional distress, poor self-control, and hostile

tendencies (10). In addition, impulsiveness has been found to be significantly associated with high-risk behaviors and having unprotected sexual relationships; the likelihood of high-risk sexual behaviors increase in parallel with increase in the individuals' score on impulsiveness (11). Mehrotra et al. also found similar results in their study (12).

Health-related problems are highly prevalent among FSWs (13). Psychological symptoms such as depression, hopelessness, weakness, and low energy are also reported to be highly prevalent among FSWs. Several studies have shown that women with these negative emotions were less able to cope with the stress resulting from insistence on using condoms in their sexual relationships (14). A significant relationship was found between hopelessness and pessimism in high-risk sexual behaviors among FSWs (15). Another study which investigated the relationship between depression and condom use among 278 Chinese FSWs showed that 62% of these women had major depression, and those with severe depression symptoms were less likely to use condoms consistently (16).

2. Objectives

To the best of our knowledge, no studies have been conducted on the relationship between mental health and HIV-related high-risk behaviors in Iran. Therefore, knowledge about the effect of mental health on high-risk behaviors, particularly in FSWs as a vulnerable group of people who face many emotional situations, can support the development of new strategies to reduce high-risk behaviors. This study was therefore designed with the aim of investigating how mental health is associated with high-risk behaviors in a sample of FSWs in Shiraz, Iran.

3. Patients and Methods

In this descriptive and cross-sectional study, which was conducted from October 2011 to May 2012, 135 participants were recruited through non-probability sampling among users of harm reduction centers, operated by Shiraz University of Medical Sciences, and from venues, illegal underground brothels, as well as areas where known or suspected illegal activities take place.

3.1. Data Collection

After the study objectives were explained to the participants and written informed consent was obtained from them, each participant was interviewed by experienced peer individuals, trained in counseling and interviewing techniques, with confidentiality and report writing in a safe place at harm reduction centers or other places where known or suspected illegal activities take place. Information was collected with questionnaires on high-risk behaviors and mental health. To increase the scientific validity of the study and facilitate the interpretation of the findings, data were also obtained from a control group of 125 healthy married women selected from residents in populated areas of the city by convenience sampling. Based on the age range of FSWs group, we tried to select the women in the control group with the same age range as much as possible. The researcher introduced himself and showed the participants a reliable ID card, explained the study objectives to the women, and either gave them the questionnaires to complete at home and return to a designated place or asked them to visit the Shiraz HIV and AIDS Research Center and complete the questionnaires there. All study participants were given some money for transportation cost and the time spent completing the questionnaires.

Demographic data including age, educational degree, and marital status were recorded. All participants completed the symptom check list-90-revised instrument and a standard questionnaire to assess high-risk behaviors, as described below. After excluding flawed questionnaires and women who declined to take part or had not met study criteria (engaging in sex work for money, drugs or aged ≥ 16) a total of 125 FSWs (response rate: 92.6%) and 125 healthy women (response rate: 100%) were included in the analysis.

3.2. Symptom Check List-90-Revised

The symptom check list-90-revised (SCL-90-R) is a psychometric scale used to measure psychological distress (17). This 90-item multidimensional questionnaire screens for a broad range of psychological problems, and responses are recorded on a 5-point Likert scale of distress, ranging from 0 (not at all) to 4 (extremely). The scores are combined for 9 primary symptom dimensions: somatization, obsessive-compulsiveness, interpersonal sensitivity, depression, anxiety, anger-hostility, phobic anxiety, paranoid ideation, and psychoticism. Higher scores reflect increasingly severe psychopathology. The scale also provides three global indexes, including global severity index (GSI) score as an indicator of overall psychological distress, a positive symptom distress index (PSDI), and a positive symptom total (PST). These indexes can be obtained as follows: GSI is obtained by averaging the scores over the total number of answered items; PST is the total number of items with non-zero responses; and PSDI is the sum of the non-zero scores divided by the PST. The SCL-90 has been validated for the Iranian population (18).

3.3. High-Risk Behavior Questionnaire

Data on high-risk behaviors such as unprotected sex, condom use, drug use, alcohol use, and so on were collected through a questionnaire prepared and designed on the basis of review articles, research published in Persian, previous questionnaire studies and a translation and adaptation of the HIV and AIDS behavioral surveillance survey developed by Family Health International (19). The questionnaire consisted

of 29 items. The pilot test was conducted on 30 FSWs and the validity and reliability of the questionnaire were analyzed. Cronbach α coefficient was 0.72 and the content validity was checked by four experts in HIV and AIDS field.

3.4. Data Analysis

All data were analyzed with descriptive statistics, multiple logistic regression tests, analysis of variance (ANOVA), and independent t tests using SPSS V18 software.

4. Results

4.1. Sociodemographic Characteristics and Prevalence of HIV-Related Risk Behaviors

The present study involved 250 women, including 125 FSWs (50%) and 125 married women (50%) as the control group. Mean age of the women in the case group (n = 125, 50%) was 32.5 ± 7.6 y (range 16-51 years) and mean age in the control group (n = 125, 50%) was 32.8 ± 7.8 years (range 16-54 years) ($P < 0.05$). The largest proportion of the women in the case group (39.2%) had a middle school degree of education, and the largest proportion of women in the control group (50.5%) had a high school degree of education. Most women in both groups were of Persian ethnic origin (83.3% in the case group, 82% in the control group).

Among FSWs, the average age at first marriage (16.7 ± 2.6 years) was lower than the control group (20.6 ± 4.5 years, $P = 0.02$). More than 50% of the sex workers were divorced, and 50% of the women in the control group were married ($P = 0.01$). Thus, most of the sex workers were not supported by anyone, while most of the women in the control group were supported by their husbands ($P = 0.01$). Mean age at first sexual intercourse (16.1 ± 4.3 years) was lower in the FSW group compared to the control group (17.9 ± 10.4 years, $P = 0.04$). Most sex workers used natural methods of contraception, whereas most women in the control group used oral contraceptives. More than 50% of sex workers had a history of abortion, whereas none of the women in the control group had an abortion ($P = 0.01$). Most of the sex workers had not used a condom in their most recent sexual intercourse, whereas most of the women in the control group had ($P = 0.03$). The mean number of sexual relationships during the previous day was higher among sex workers compared to their counterparts in the control group ($P = 0.001$).

None of the women in the control group had the history of alcohol use, whereas one-third of the sex workers reported taking alcoholic drinks before or during intercourse. All sex workers had a history of using narcotics or psychoactive drugs during their lifetime, and most of them were daily multidrug users (opium, hashish, psychotic drugs, methamphetamine, etc.). Women in the control group had no history of drug abuse ($P = 0.01$).

4.2. Mental Health Status

Mean scores on all subscales of the SCL-90-R were lower in the control group ($P < 0.003$). In other words, women in this group had a more favorable mental health status, whereas psychological symptoms were significantly more prevalent among FSWs. When we compared scores in the three main domains of mental health (GSI, PST, and PSDI), the scores between two groups differed significantly with respect to GSI and PST ($P = 0.0001$). This finding generally indicates that women in the control group had a more favorable mental health status.

4.3. Relationship Between SCL-90-R Scores and High-Risk Behaviors

Analysis of the results for quantitative variables with Pearson correlation coefficient showed that GSI was significantly associated with the number of monetary or nonmonetary sexual relationships during the previous day or week, as well as with the number of sexual partners during the previous week; another words as GSI decreased, the incidence of high-risk sexual behaviors increased ($P < 0.007$). Moreover, a significant inverse relationship was found between GSI and age at first sexual intercourse: as this age decreased, so did the mental health status ($P = 0.000$).

Analysis of the relationship between all SCL-90-R subscores and the quantitative variables in this study showed a significant relationship between all subscores and the number of sexual partners during the previous day or week, as well as between subscores and age at first drug use ($P = 0.000$). Furthermore, the mean scores on all subscales were inversely related with age at first sexual intercourse ($P < 0.001$) and directly related with having several sexual partners during the previous week ($P < 0.003$).

The results of t tests revealed a significant relationship between higher GSI and a history of abortion and negative responses on mental health items ($P = 0.03$). A significant relationship was also found between GSI and condom use during the most recent sexual intercourse event: women with lower mental health scores tended to use condoms less ($P = 0.03$). Moreover, a significant relationship was observed between condom use during the most recent sexual intercourse and all SCL-90-R subscores except for obsessive-compulsive, interpersonal sensitivity, and psychoticism ($P < 0.01$). This finding shows that mean scores for these psychological symptoms were higher among women not using condoms during their most recent sexual intercourse. The results also showed a significant relationship between depression and abortion ($P = 0.03$). Finally, a significant relationship was found between GSI and 9 subscores with drug abuse, drug injection, and alcohol abuse; mental health was lower among women abusing drugs, alcohol or injecting drugs ($P = 0.000$).

5. Discussion

To the best of our knowledge, the present study is the first to investigate the relationship between mental health with HIV transmission in Iranian FSWs. The findings of this study show that high-risk behaviors were more frequent among FSW compared to women in the control group. Earlier research also found that high-risk behaviors were frequent in the former group (20). Because these women are bridges of HIV transmission to their partners and indirectly to the society, interventions are necessary to increase their knowledge and reduce their high-risk behaviors.

The average age at first sexual intercourse (about 16 years) suggests an earlier engagement in illegal sexual relationships and sensation seeking-behaviors which, according to Iranian culture, can result in the disruption of the family system, divorce, left alone, and finally sex work. Half of the women in our sample of FSWs were divorced and not supported by anybody.

According to SCL-90-R scores, FSWs experienced more psychological distress than their non-sex worker counterparts. A significant difference was found between two groups regarding GSI and all 9 subscores, and most psychological symptoms were related to hostility and anxiety. According to GSI results, almost two-thirds of the sex workers experienced significantly moderate to severe disorder symptoms more than women in the control group. These results are in line with the studies in Hong Kong and France (21, 22), but in contrast with the findings of a study in New Zealand, which found no significant difference between sex workers and other women with respect to general well-being (23). The results of another study on FSWs in the USA found that more than one-third of the participants suffered from anxiety symptoms and more than half of them had depression symptoms (24).

With regard to the correlation between mental health and high-risk behaviors, the present results confirm that GSI is associated with certain high-risk sexual behaviors. Sex workers with higher psychological distress were more likely to report high-risk behaviors, which exposed them to HIV infection, and individuals with higher GSI scores were more likely to have more sexual relationships and different sexual partners during the previous week. In addition, FSWs with higher GSI scores and more psychological symptoms in all subscales (except for obsessive-compulsive, interpersonal sensitivity, and psychoticism) were less likely to use condoms during their most recent sexual intercourse. This finding is generally consistent with that of a study conducted in China (25). Another study in China that involved 234 FSWs who were also injection drug users showed that mental health problems were prevalent among this group, and a large number of these women experienced psychological problems such as depression, disappointment, and pessimism. However, optimism had a negative correlation with discontinuous use of condoms during the previous 6 months, i.e. more optimistic women were more likely to use condoms consistently (26).

Other studies of high-risk groups such as adolescent African-American females and men who have sex with other men have confirmed the relationship between psychological distress and high-risk behaviors (27, 28). Several studies have shown that negative emotions such as depression, anxiety, and anger are associated with high-risk behaviors, which expose the individuals to HIV infection or transmission (13). Other studies have also reported that FSWs with symptoms of depression were less likely to use condoms consistently (14). In addition, depression has been related to high-risk behaviors among women referred to the sexually transmitted diseases clinics. Compared to non-depressed individuals, depressed women were more likely to engage in high-risk behaviors such as having sex for drugs or money, sexual relationships with injection drug users, having several sexual partners, and abusing drugs and alcohol (29).

Regarding the associations between mental health, drug abuse, and other high-risk behaviors in our study group, our findings suggest that the sex workers' level of psychological distress should be taken into consideration in designing programs to prevent HIV transmission because negative emotions can disturb the individuals' autoregulation processes. According to Beck's interpretation, individuals who experience negative emotions such as depression and disappointment may develop maladaptive thoughts, which can decrease their motivation for self-protection. Negative emotions also reduce the individuals' capability to conform to long-term thoughts of avoiding high-risk behaviors with negative outcomes, which may increase the likelihood of these behaviors. Because FSWs experience negative emotions, they are more vulnerable to high-risk behaviors (26). Harm reduction strategies for FSWs should consider their level of psychological distress, because sadness, apathy, and indifference resulting from disorders such as depression and anxiety can interfere with these women's motivation to control high-risk behaviors associated with HIV transmission. Psychological distress may also limit their access to healthcare services by increasing their loneliness and seclusion.

The findings of the present study showed that compared to women in the control group, FSWs in Shiraz scored low on mental health instruments, which was related to some high-risk behaviors for HIV transmission. Our findings emphasize the need for mental health-oriented preventive interventions such as psychology and psychiatry clinics at harm reduction centers. Unfortunately, only a limited number of psychologists and counselors work at these centers, and because of the lack of facilities and specialists, they cannot respond

to all clients' needs. Nevertheless, AIDS prevention programs and harm reduction strategies should involve psychological interventions by skilled specialists. Such interventions should include monthly psychological evaluation of the patients and high-risk individuals, and measures to improve their mental health and reduce their high-risk behaviors. Additional clinical studies will be needed to evaluate the cost-effectiveness of our recommended intervention.

The present study had some limitations. First, because sex work is a religious taboo in Iran, accordingly we used convenience sampling. All questionnaires were completed by skilled peers at harm reduction centers, illegal brothels, and areas where known or suspected illegal activities take place. Therefore, the study sample was probably not representative of the whole population of FSWs. Contacting and recruiting participants for a study of this nature are made difficult by their mistrust, lack of cooperation, and their fear of arrest. Furthermore, some women who were illiterate or had substance abuse problems found it difficult to complete the questionnaire, so the researchers had to read the questions to them and record their answers in writing. We cannot rule out that this process may have affected the data for some participants.

High-risk behaviors in high-risk groups like FSWs are a bridge for HIV transmission to their partners and other members of society, which pose a public health challenge. In our studied FSWs, these behaviors were related to the mental health. Psychological and psychiatric interventions, including medication therapy, individual and group psychotherapy and educational interventions seem necessary to improve their mental health. Such interventions can reduce high-risk behaviors and accordingly decrease the rate of HIV transmission. We caution, however, that the present study was descriptive and cross-sectional in nature; additional clinical research and longitudinal studies are needed to confirm our results. The lack of temporality in cross-sectional studies and bias in self-reported data were the other limitations of the present study.

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Authors' Contributions

Mahmood Amini Lari conducted the literature review, wrote the first draft, and edited it. Pezhman Bagheri designed the study, involved in data acquisition and analysis. Fatemeh Ameli was supervisor and responsible for the quality assurance and control.

Financial Disclosure

We, Mahmood Amini Lari, as the first and corresponding author, Pezhman Bagheri, as the second author, and Fatemeh Ameli, as the third author, declared no conflict of interests. We also conformed to the Helsinki Declaration concerning human rights and informed consent of 1975, revised in 2000. It should be mentioned that all procedures were followed in accordance with the ethical standards of the Ethics Committee on human experimentation of Shiraz University of Medical Science, Shiraz-Iran.

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References

1. *UNAIDS report on the global AIDS epidemic 2012*. .: UNAIDS Global report; 2012.
2. Ilic D, Sipetic S, Bjegovic V. Risk of HIV infection among indoor and street sex workers and their use of health services in Belgrade, Serbia. *Srp Arh Celok Lek*. 2010;**138**(3-4):219–24.
3. Center for disease management. Ministry of Health and Medical Education IROI. *Statistics of HIV/ AIDS in islamic republic of Iran*.; 2011.
4. Farahani FK, Shah I, Cleland J, Mohammadi MR. Adolescent males and young females in tehran: differing perspectives, behaviors and needs for reproductive health and implications for gender sensitive interventions. *J Reprod Infertil*. 2012;**13**(2):101–10.
5. Mirzazadeh A, Haghdoost AA, Nedjat S, Navadeh S, McFarland W, Mohammad K. Accuracy of HIV-related risk behaviors reported by female sex workers, Iran: a method to quantify measurement bias in marginalized populations. *AIDS Behav*. 2013;**17**(2):623–31.
6. Mohebbi MR. Female sex workers and fear of stigmatisation. *Sex Transm Infect*. 2005;**81**(2):180–1.
7. Cai Y, Shi R, Shen T, Pei B, Jiang X, Ye X, et al. A study of HIV/AIDS related knowledge, attitude and behaviors among female sex workers in Shanghai China. *BMC Public Health*. 2010;**10**:377.
8. Aggleton P, O'Reilly K, Slutkin G, Davies P. Risking everything? Risk behavior, behavior change, and AIDS. *Science*. 1994; **265**(5170):341–5.
9. Marks G, Bingman CR, Duval TS. Negative affect and unsafe sex in HIV-positive men. *AIDS Behav*. 1998;**2**(2):89–99.
10. Trobst KK, Herbst JH, Masters HL, Costa PT. Personality Pathways to Unsafe Sex: Personality, Condom Use, and HIV Risk Behaviors. *J Res Pers*. 2002;**36**(2):117–33.
11. Hoyle RH, Fejfar MC, Miller JD. Personality and sexual risk taking: a quantitative review. *J Pers*. 2000;**68**(6):1203–31.
12. Mehrotra P, Noar SM, Zimmerman RS, Palmgreen P. Demographic and personality factors as predictors of HIV/STD partner-specific risk perceptions: implications for interventions. *AIDS Educ Prev*. 2009;**21**(1):39–54.
13. Crepaz N, Marks G. Are negative affective states associated with HIV sexual risk behaviors? A meta-analytic review. *Health Psychol*. 2001;**20**(4):291–9.
14. O'Leary A, Jemmott LS. *Women at Risk: Issues in the Primary Prevention of AIDS*.New York: Springer; 1995.
15. Paone D, Cooper H, Alperen J, Shi Q, Des Jarlais DC. HIV risk behaviours of current sex workers attending syringe exchange: the experiences of women in five US cities. *AIDS Care*. 1999;**11**(3):269–80.
16. Hong Y, Li X, Fang X, Zhao R. Depressive symptoms and condom use with clients among female sex workers in China. *Sex Health*. 2007;**4**(2):99–104.

17. Lynn SG, Bauch CD, Williams DE, Beatty CW, Mellon MW, Weaver AL. Psychologic profile of tinnitus patients using the SCL-90-R and Tinnitus Handicap Inventory. *Otol Neurotol.* 2003;**24**(6):878–81.
18. Yazdi Bagheri S, Bolhari J, Shah Mohammad D. Epidemiology of mental disorders in rural areas Meybod Yazd. *Treat Thought J.* 1994;**1**(41).
19. Amon J, Brown T, Hogle J, MacNeil J, Magnani R, Mills S, et al. Behavioral surveillance surveys: guidelines for repeated behavioral surveys in populations at risk of HIV. *Fam Health Int.* 2000:1–9.
20. Zhu BY, Bu J, Huang PY, Zhou ZG, Yin YP, Chen XS, et al. Epidemiology of sexually transmitted infections, HIV, and related high-risk behaviors among female sex workers in Guangxi Autonomous Region, China. *Jpn J Infect Dis.* 2012;**65**(1):75–8.
21. Ling DC, Wong WC, Holroyd EA, Gray SA. Silent killers of the night: an exploration of psychological health and suicidality among female street sex workers. *J Sex Marital Ther.* 2007;**33**(4):281–99.
22. Rossler W, Koch U, Lauber C, Hass AK, Altwegg M, Ajdacic-Gross V, et al. The mental health of female sex workers. *Acta Psychiatr Scand.* 2010;**122**(2):143–52.
23. Romans SE, Potter K, Martin J, Herbison P. The mental and physical health of female sex workers: a comparative study. *Aust N Z J Psychiatry.* 2001;**35**(1):75–80.
24. Surratt HL, Kurtz SP, Weaver JC, Inciardi JA. The connections of mental health problems, violent life experiences, and the social milieu of the "stroll" with the HIV risk behaviors of female street sex workers. *J Psychol Hum Sex.* 2005;**17**(1-2):23–44.
25. Lau JT, Tsui HY, Ho SP, Wong E, Yang X. Prevalence of psychological problems and relationships with condom use and HIV prevention behaviors among Chinese female sex workers in Hong Kong. *AIDS Care.* 2010;**22**(6):659–68.
26. Gu J, Lau JT, Chen H, Chen X, Liu C, Liu J. Mental health and interpersonal factors associated with HIV-related risk behaviors among non-institutionalized female injection drug users who are also sex workers in China. *Women Health.* 2010;**50**(1):20–36.
27. Seth P, Raiji PT, DiClemente RJ, Wingood GM, Rose E. Psychological distress as a correlate of a biologically confirmed STI, risky sexual practices, self-efficacy and communication with male sex partners in African-American female adolescents. *Psychol Health Med.* 2009;**14**(3):291–300.
28. Safren SA, Thomas BE, Mimiaga MJ, Chandrasekaran V, Menon S, Swaminathan S, et al. Depressive symptoms and human immunodeficiency virus risk behavior among men who have sex with men in Chennai, India. *Psychol Health Med.* 2009; **14**(6):705–15.
29. Hutton HE, Lyketsos CG, Zenilman JM, Thompson RE, Erbelding EJ. Depression and HIV risk behaviors among patients in a sexually transmitted disease clinic. *Am J Psychiatry.* 2004;**161**(5):912–4.