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Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_1046_20

Predictors of preventive behaviors of AIDS/HIV based on Health Belief Model constructs in women with high-risk sexual behaviors: A cross-sectional survey

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Abstract:

BACKGROUND: Worldwide, AIDS is an acute problem. Health Belief Model (HBM) is a model for prevention and control of diseases. This study examined the predictors of preventive behaviors of HIV/AIDS based on HBM constructs in participants.

MATERIALS AND METHODS: This cross-sectional study was performed on 200 women who were referred to vulnerable women's centers across Tabriz city between November and December 2018. Participants were selected by census sampling. Inclusion criteria were having a health record, multiple sexual partners, reading and writing skills, and willingness to participate in the study. To collect data, questionnaires of sociodemographic characteristics, HIV knowledge, self-efficacy for negotiating safe sex, perceived sensitivity, perceived severity, perceived benefits, perceived barriers, and behavioral prevention (BP) were used. The collected data were analyzed using SPSS version 19 through Pearson's correlation coefficient, one-way ANOVA, and multiple linear regression analyses. The significant level was set at $\alpha = 0.05$.

RESULTS: Pearson's correlation test showed a statistically significant correlation between BP and perceived sensitivity ($r = 0.25$), perceived benefits ($r = 0.32$), self-efficacy ($r = 0.33$), and HIV knowledge ($r = 0.25$) constructs ($P < 0.001$). According to the multiple linear regression, perceived sensitivity ($P = 0.020$), perceived benefits ($P = 0.036$), and some of the sociodemographic characteristics were found to be predictors of preventive behaviors that explained in total 50% of variance of BP ($P < 0.05$ and $R^2 = 0.504$).

CONCLUSION: It seems that the HBM is useful to predict HIV preventive behaviors among this vulnerable group. Training programs should be aimed on improving the health belief of HIV preventive behaviors.

Keywords:

Behavioral prevention, health Belief Model, HIV

Introduction

Worldwide, AIDS is a major health and social issue. According to the World Health Organization (WHO) 2018 statistic, around 37.9 million people were infected with HIV, of which 18.8 million were women aged 15 years and older.^[1]

The first case of AIDS was reported in Iran in 1986. Although the prevalence of AIDS in Iran is lower than the world average and the eastern Mediterranean countries, in recent years, it has been estimated that Iran is facing the AIDS crisis.^[2] The average number of HIV cases in Iran in 2018 was 61,000 people while 4400 new cases have been recorded.^[3]

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How to cite this article: Alizade M, Farshbaf-Khalili A, Malakouti J, Mirghafourvand M. Predictors of preventive behaviors of AIDS/HIV based on Health Belief Model constructs in women with high-risk sexual behaviors: A cross-sectional survey. *J Edu Health Promot* 2021;10:446.

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Received: 18-08-2020

Accepted: 28-09-2020

Published: 31-12-2021

Although in the last 15 years the HIV epidemic in Iran has been caused by injecting drugs,^[4] HIV transmission has been increasing in recent years by sex and the number of women infected with HIV is on the rise.^[4,5]

One of the factors contributing to the rapid spread of HIV in Asia is the transmission of infection among female sex workers (FSWs) and their clients.^[6] The WHO has identified women with high-risk sexual behavior as a high-risk group in many countries.^[7] According to the report of the Centers for Disease Control and Prevention, HIV prevalence among women with high-risk sexual behavior is 4.5%.^[4] The term “prostitution” is popularly used to refer the trade of sexual services for payment in cash or kind and women with high-risk sexual behavior are known as FSWs.^[8] Sex and high-risk behaviors are unspoken matters and a clandestine phenomenon in Iran. FSWs are hidden in the community, mainly because of strong stigmatization and legal punishment. These are the main reasons for the very limited data available on this population.^[9] Because FSWs are often not in a position to control HIV risk factors due to legal, political, social, and occupational conditions, they are therefore more vulnerable to HIV.^[10]

To prevent HIV, empowering community, promoting the proper use of condom, screening sexually transmitted infections (STIs), periodic STI treatment, antiretroviral therapy, testing and counseling, linkages to tuberculosis care, voluntary medical male circumcision, harm reduction for people who inject and use drugs, elimination of mother-to-child transmission of HIV, voluntary HIV testing, and counseling are among the necessary measures.^[11] Interventions such as community empowerment aimed at reducing the vulnerability of FSW can enable them to have more control over their condition.^[12] Studies have shown that community empowerment helps FSWs access health services and make behavioral changes and thereby reducing HIV prevalence.^[13,14] One way to prevent HIV is to use condoms correctly and consistently. Its use has been recommended for the prevention of HIV infection since the mid-1980s. Condom promotion programs have been reported to reduce HIV prevalence in many areas such as Africa, Asia, and Latin America.^[15] It has been shown that continued condom use can reduce the risk of HIV infection in FSWs by up to 69%.^[16] Although the only way to prevent HIV is behavioral prevention (BP), only a small group of FSWs does this, and there is not enough awareness among them as to how to prevent the infection.^[17]

One of the most widely used conceptual frameworks in health behavior research is the Health Belief Model (HBM) which explains change and maintenance of health-related behaviors.^[18] Based on this model, to take preventive behaviors, people should first be sensitive to the problem

of AIDS (perceived sensitivity); then understand the depth of this risk and the seriousness of its various physical, psychological, social, and economic dimensions (perceived severity); believe that the prevention program is useful and feasible for the AIDS prevention (perceived benefits); find deterrent factors of action as less costly than its benefits (perceived barriers); and, meanwhile, individuals should be also convinced of their ability to implement preventive behaviors (self-efficacy), to ultimately gain health behaviors against AIDS. Using this model, behavioral change strategies can be designed for FSWs who are at the highest risk for HIV.^[19]

The WHO has emphasized the importance of preventing the transmission of HIV through sexual intercourse,^[20] however in Iran, a study on the adoption of prevention behavior in the area of preventing sexually transmitted disease, including HIV, has not been conducted. Given that STIs have increased in Iran in recent years, the need for such a study is felt more and more. Identifying and controlling women’s problems with the most effective method, especially during reproduction, are the main duty of health-care providers. The purpose of this study was to determine the predictors of HIV / AIDS preventive behaviors based on HBM constructs in women with high-risk sexual behaviors in Tabriz city.

Materials and Methods

Study design and participants

Between November and December 2018, this cross-sectional study was performed on 200 FSWs who were referred to vulnerable women’s centers across Tabriz city, North-western Iran. This study was performed after obtaining permission from the Ethics Committee of Tabriz University of Medical Sciences (ethics code: IR.TBZMED.REC.1397.329). Eligible criteria for participants were having a health record, multiple sexual partners, reading and writing skills, and willingness to participate in the study.

The sample size for BP predictors, using G-power and considering $\alpha = 0.05$, $\beta = 0.05$, effect size = 0.097, and two-tailed hypothesis, was estimated as 111.^[21]

Sampling

The study participants were selected according to census sampling. The study protocol and purposes were explained to the participants. The participants were ensured that their information would be kept confidential. We selected 219 eligible participants at first, of whom 19 declined to participate and 200 consented.

Data collection tool

The data collection tool consisted of the following seven questionnaires: sociodemographic characteristics

questionnaire, HIV knowledge, BP on STIs, HBM constructs questionnaire including self-efficacy for negotiating safe sex, perceived sensitivity and severity, perceived benefits, and perceived barriers.

Sociodemographic characteristics questionnaire included questions about age, education level, family's income, marital status, father's job and education, husband's job and education, mothers' job and education, birth place, the number of marriages and children, age of admission to this work, the attendance duration at this work, a history of sexual abuse in childhood, smoking history, sexual violence history, depression history, alcohol use history, home escape history, team employment, individual employment, history of imprisonment, number of sex work per week, work in the client's home, work in a private home, condom use in clients, client type, place of supplying condoms, and condom use in nonmonetary clients.

The perceived sensitivity and severity questionnaire was developed by Ekaet *et al.* in 2013 to measure the level of fear of HIV susceptibility (Cronbach's alpha = 0.88–0.92). It consists of ten items: six items for perceived sensitivity and four items for perceived severity. The items are made up of a 3-point Likert rating scale including strongly agree or agree (score = 3), not agree or not opposed (score = 2), and strongly disagree or disagree (score = 1). Therefore, a higher score reflects a higher level of perceived sensitivity and severity to HIV/AIDS.^[22]

The perceived benefits questionnaire for measuring the level of safer sex benefits was designed by Noreen *et al.* in 2012 (Cronbach's alpha = 0.78) that includes eight items which are assessed on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree). The responses reflect the level of agreement as measured on the 8-item scale, with scores ranging from 8 to 40. Higher scores indicate a higher level of perceived benefits from adopting safe sex behavior.^[23]

The perceived barriers questionnaire was designed by DeHart and Birkimer in 1997 (Cronbach's alpha = 0.86) for measuring the level of safer sex barriers including 13 items that are assessed on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree). The responses reflect the level of agreement as measured on the 13-item scale, with scores ranging from 13 to 65. Higher scores indicate a higher level of perceived barriers from adopting safe sex behavior.^[24]

The HIV knowledge questionnaire was developed by Carey and Schroder in 2002 (Cronbach's alpha = 0.91)

including 18 items. The items reflect information about HIV transmission, condom use, and AIDS-related knowledge. The participants responded to each item by checking "Yes," "No," or "I do not know." To identify the level of knowledge, score 1 was given to "Yes" answers and zero was given to "No" or "I do not know" answers. The range of scores is 0 to 18 and the higher scores indicate better knowledge.^[25]

The self-efficacy for negotiating safe sex questionnaire was first created by Shaweno and Tekletsadik in 2013 (Cronbach's alpha = 0.92), which includes 9 items that measure the self-efficacy of negotiating safe sex behaviors. The items elicit responses using a 5-point Likert scale that ranges from "strongly disagree" to "strongly agree." In this study, the responses for each item were scored as 0 = strongly disagree, 1 = disagree, 2 = undecided, 3 = agree, and 4 = strongly agree. Higher scores indicate greater condom use self-efficacy.^[26]

The questionnaire of BP on STIs has 12 items with three choices: score 2 is assigned to "always," score 1 to "sometimes," and score 0 to "never," then the total score is calculated. The minimum possible score of BP is 0 and the maximum is 24. It was prepared by Farshbaf-Khalili *et al.* in 2014 and its validity was confirmed by content validity index (CVI), content validity ratio (CVR), and Cronbach's alpha of 0.72, 0.81, and 0.8, respectively.^[21]

To ensure the translation validity of self-efficacy, perceived sensitivity and severity, perceived benefits, perceived barriers, and HIV knowledge questionnaires, the translation process was conducted by applying the forward and back-translation method. First, the English version of the questionnaires was translated into Persian by a person proficient in both languages. Then, the Persian version of the questionnaires was translated into English by another two professional persons who were not involved in the previous stage. The final questionnaires were developed after review by two individuals who are familiar with medical terms and mastered both languages. To verify content validity, comments were requested from ten expert faculty members at Tabriz University of Medical Sciences. The CVR and CVI were calculated and confirmed. CVI and CVR indices were 0.96 and 1 (perceived sensitivity and severity), 0.99 and 0.88 (perceived benefits questionnaire), 0.94 and 0.94 (perceived barriers questionnaire), 1 and 1 (self-efficacy questionnaire), and 0.92 and 0.94 (HIV knowledge questionnaire) respectively. Prior to conducting the main project, a pilot study was carried out among twenty FSWs and the reliability of the questionnaire was investigated by calculating internal consistency. The Cronbach's α was found to be 0.93 for "perceived sensitivity and severity questionnaire," 0.84 for "perceived benefits questionnaire," 0.76 for

“perceived barriers questionnaire,” 0.73 for “self-efficacy questionnaire,” 0.75 for “HIV knowledge questionnaire,” and 0.72 for “BP questionnaire.” The participants completed the questionnaires after the researcher explained the study objectives to the participants and encouraged them to respond by observing ethics in research. The participants were ensured that their information would be kept confidential. Informed written consents were taken from all participants. Before data collection, a written consent was obtained from all participants. Voluntariness and confidentiality of the information were emphasized (Ethics Code: IR.TBZMED.REC.1397.329).

Data analysis

Statistical analysis was done by using SPSS version 19. The quantitative data were demonstrated as mean and standard deviation (SD) and the qualitative data were shown in number and percent. Data were analyzed using Pearson’s correlation coefficient, one-way ANOVA, and multiple linear regression analyses. In order to predict the effect of each of the independent variables on the BP, all

variables with $P < 0.1$ in two-variable tests were entered into the multiple linear regression model with backward strategy. The significant level was set at $\alpha = 0.05$.

Results

The age range of the FSWs was 16–55 years, and their mean \pm SD age was 36.9 ± 9.23 years. Less than half of the FSWs were married (83 [41.5%]), and about one-quarter were divorced (45 [22.5%]). The mean \pm SD age of admission to this work was 26.8 ± 7.2 years, and the mean \pm SD attendance at this work was 6 ± 10 years, with a range of 1–35 years. More than half of the FSWs had a smoking history (107 [53.5%]) and sexual violence history (115 [57.5%]). More than two-thirds of them had a depression history (142 [71%]). About half of the people used condoms in sexual activities with all their clients (96 [48%]). The other Sociodemographic characteristics of FSWs are shown in Tables 1 and 2.

The mean \pm SD score of HBM constructs and BP and knowledge about HIV transmission in women are shown in

Table 1: Demographic characteristics of female sex workers (n=200)

Variables	n (%)	Variables	n (%)
Age group (years)		Number of children	
<20	10 (5)	0	32 (16)
21-30	42 (21)	1-2	127 (63.5)
≥ 31	148 (74)	2 or more	41 (20.5)
Marital status		Father’s education	
Single	6 (3)	Illiterate	125 (62.5)
Married	83 (41.5)	Primary school	56 (28)
Divorced	45 (22.5)	Secondary school	13 (6.5)
Widow	16 (8)	High school or higher	6 (3)
Recorded concubine	27 (13.5)	Education level	
Unrecorded concubine	23 (11.5)	Primary school	66 (33)
Husband’s education		Secondary school	56 (28)
Illiterate	26 (19.5)	High school	39 (19.5)
Primary or secondary	77 (58)	Diploma or academic	39 (19.5)
High school	18 (13.5)	Father’s job	
Academic or diploma	9 (12)	Unemployed	40 (20)
No response	66 (33)	Worker	96 (48)
Husband’s job		Employee	9 (4.5)
Unemployed	38 (28.6)	Self-employed	55 (27.5)
Worker	25 (18.7)	Mother’s job	
Employee or self-employed	70 (52.7)	Homemaker	188 (94)
No response	67 (33.5)	Employee	12 (6)
Number of marriages		Mother’s education	
0 or 1	154 (77)	Illiterate	155 (77.5)
2 or more	46 (23)	Primary school	34 (17)
Family income		Secondary school or higher	11 (5.5)
Inadequate	73 (36.5)		
Less than adequate	72 (36)		
Adequate	55 (27.5)		
Birth place			
City	129 (64.5)		
Village	71 (35.5)		

Table 3. The mean ± SD score of BP was 15.62 ± 3.58. Among HBM constructs, the highest and the lowest mean ± SD scores belonged to the perceived severity (11.01 ± 1.50) and self-efficacy (19.96 ± 5.12) constructs, respectively [Table 3].

The relationship between the constructs of the HBM and BP showed that perceived severity ($r = 0.25$), perceived benefits ($r = 0.32$), self-efficacy ($r = 0.33$), and HIV knowledge ($r = 0.25$) had a positive significant association ($P < 0.001$) with BP and, with increase in these variables, the level of BP increases [Table 4].

In order to determine the predictors of BP, multiple linear regression analysis was done by backward strategy. The results showed that perceived severity, perceived benefits, and some of the sociodemographic characteristics (such as sexual violence history, depression history, work at the client’s home, condom use in clients, husband’s job and education, and condom use in nonmonetary clients) were predictors of BP, and these nine variables explained in total 50% of variance of BP ($P < 0.05$ and $R^2 = 0.504$). Among the constructs of the HBM and HIV knowledge, only perceived

Table 2: High-risk behaviors characteristics of female sex workers (n=200)

Variables	n (%)	Variables	n (%)
Age of admission to this work (years)		Attendance duration at this work (years)	
13-19	34 (17)	<1	4 (2)
20-30	119 (59.5)	2	12 (6)
31-40	42 (21)	3	17 (8.5)
41-47	5 (2.5)	4	9 (4.5)
		>4	158 (79)
Condom use in clients		Places of supplying condoms	
In all clients	96 (48)	Clients	23 (11.5)
In nonmonetary clients	30 (15)	Pharmacies	13 (6.5)
In monetary clients	33 (16.5)	Health-care centers	65 (32.5)
Depending on clients	41 (20.5)	High-risk behavior centers	99 (49.5)
History of sexual abuse in childhood		Sexual violence history	
Yes	61 (30.5)	Yes	115 (57.5)
No	139 (69.5)	Yes	85 (42.5)
Smoking history		Home escape history	
Yes	107 (53.5)	Yes	107 (53.5)
Yes	93 (46.5)	Yes	93 (46.5)
Alcohol use history		Depression history	
Yes	136 (68)	Yes	142 (71)
Yes	64 (32)	Yes	58 (29)
Work at the client’s home		Work in a private home	
Yes	125 (62.5)	Yes	90 (45)
Yes	75 (37.5)	Yes	110 (55)
Condom use in nonmonetary clients		Client type	
Yes	76 (67.3)	Permanent	57 (28.5)
Yes	37 (32.7)	Varied	143 (71.5)
History of imprisonment		Team employment	
Yes	48 (24)	Yes	39 (19.5)
Yes	152 (76)	Yes	161 (80.5)
Number of sex work per week		Individual employment	
1-2 times	118 (59)	Yes	188 (94)
3 or more	82 (41)	No	12 (6)

Table 3: The mean (standard deviation) score of Health Belief Model constructs, behavioral prevention, and knowledge about HIV transmission in female sex workers (n=200)

Variable ^a	Mean±SD	Minimum score	Maximum score	Possible score
Perceived sensitivity	14.40±3.99	6	18	6-18
Perceived severity	11.01±1.50	4	12	4-12
Perceived benefits	33.11±4.76	14	40	8-40
Perceived barriers	39.69±7.61	16	59	13-65
Self-efficacy for negotiating safe sex	19.96±5.12	4	36	0-36
Behavioral prevention	15.62±3.58	5	22	0-24
Knowledge of HIV transmission	11.97±2.68	4	17	0-18

^aHigher score in each variable indicates higher state. SD=Standard deviation

benefits (0.036) and perceived severity (0.020) had a significant relationship with anticipating the adoption of HIV prevention behaviors, as shown in Table 5. Increased perceived benefits and perceived severity were directly related with the adoption of HIV prevention behaviors, that is, with increase in these variables, adoption of HIV prevention behaviors increases.

Discussion

In our study, majority of the clients belonged to the age group of 31 years and above, where the mean age of the participants was 36.9 years and the frequent first illegitimate sexual activity was at the age of 20–30 years. The present study showed that 53.5% of the cases had experienced smoking and running away from home, which could be taken as a major health risk for entry into prostitution. In a study, it was shown that the mean age of the participants was 30.3 (7.5) years and the frequent first illegitimate sexual activity was at the age of 18–20 years.^[27] A study showed that the highest frequency was associated with the age range of 14–18 years.^[28] The above-mentioned studies disagree with ours. The present study showed that 68% of the cases had experienced alcohol consumption. Heavy alcohol use was reported by FSWs in various studies.^[29,30] Studies also indicate the necessity of harm-reduction interventions for alcohol use among FSWs.^[30,31]

This study demonstrated the utilization of the HBM model for investigation of HIV/AIDS prevention behaviors during commercial sex among FSWs in Tabriz. The results showed that FSWs who possessed higher levels of perceived severity, perceived benefits, self-efficacy, and HIV knowledge and lower levels of perceived barriers and sensitivity toward HIV preventive behaviors were more likely to use HIV preventive behaviors.

One possible explanation of the indirect effect of perceived sensitivity is its association with BP, which was mediated by other variables.^[19] The most significant barrier to using condom in the current study was that it reduces sexual pleasure. This finding is consistent with the results reported in studies done in both Iran and other countries.^[32,33] Sexual dissatisfaction has been cited as an effective factor in not using condoms.^[34,35] Therefore, it is necessary to use behavioral–educational strategies to overcome constraint barriers to change the negative attitude toward condom use among FSWs and their clients.

Given the results of the current study, the weakest BP items were having oral–anal and oral–vaginal sex, having sex with someone engaged in sex with others, and having sex with someone who was recently in prison, and less

Table 4: The relationship between the constructs of the Health Belief Model and knowledge with behavioral prevention (n=200)

Variable	BP	
	r	P
Perceived sensitivity	-0.74	0.29 ^a
Perceived severity	0.25	*<0.001 ^a
Perceived benefits	0.32	*<0.001 ^a
Perceived barriers	-0.11	0.10
Self-efficacy for negotiating safe sex	0.33	*<0.001 ^a
Knowledge of HIV transmission	0.25	*<0.001 ^a

^aPearson's correlation coefficient, *P values lower than 0.05 are considered statistically significant. BP=Behavioral prevention

Table 5: Predictors of HIV prevention behavior in female sex workers according to multiple linear regression analysis

Variable	B ^a (95% CI) ^b	P
Perceived benefits	0.15 (0.01-0.29)	0.036
Perceived severity	0.45 (-0.83-0.07)	0.020
Sexual violence history		
No	Reference	
Yes	-2.09 (-3.73--0.45)	0.013
Condom use in nonmonetary clients		
No	Reference	
Yes	1.58 (-0.07-3.25)	0.061
Depression history		
No	Reference	
Yes	2.32 (0.70-3.95)	0.006
Work at the client's home		
No	Reference	
Yes	-1.82 (-3.25--0.4)	0.013
Condom use in clients		
Depending on clients	Reference	
In nonmonetary clients	2.06 (0.39-3.73)	0.016
In monetary clients	-0.61 (-3.94-2.71)	0.712
In all clients	-1.02 (-3.77-1.72)	0.457
Husband's job		
Employee or self-employed	Reference	
Unemployed	-1.39 (-2.94-0.15)	0.076
Worker	0.21 (-2.39-2.82)	0.867
Husband's education		
Academic	Reference	
Illiterate	-2 (-4.01-0.01)	0.051
Primary	0.72 (-2.8-4.24)	0.683
Secondary	0.41 (-2.79-3.61)	0.798
High school	-2 (-4.14--0.06)	0.043

Adjusted R²=0.504. Multiple linear regression model. All variables with P<0.1 were entered into the model with backward strategy, ^a95% CI=95% confidence interval, ^bP<0.05.

than half of the FSWs have been using condoms in sexual activities with their clients. However, it is much lower than studies which showed the use of condoms in FSW clients in Kenya.^[36] In the current study, the knowledge of FSWs in the context of HIV transmission was moderate, whereas it is in disagreement with studies which showed that women with HIV have good knowledge.^[37] Therefore, the knowledge and BP of FSWs

in our society is weaker than that of other societies, which can be promoted by designing educational programs for promoting the knowledge and BP in this vulnerable group, as in an interventional study, it was shown that the educational curriculum improves the knowledge and attitude and reduces the high-risk behaviors of FSWs and a substantial improvement in voluntary HIV testing and counseling and condom use has been reported.^[38]

In the present study, there was a significant relationship between BP and income, husband's job, place of birth, and wife's education. In a study, it was shown that there was a significant relationship between BP and spouse education and income levels among women referring to health centers^[21] and is consistent with our study.

The regression analysis demonstrated that the perceived severity and benefits were the best predictors of HIV preventive behaviors, which is consistent with findings of the study that investigated the perceived benefits anticipates an HIV test.^[39] The prediction of preventive behaviors through perceived benefits indicates that the benefits of preventive behaviors are well understood by individuals, which can lead them to change their behavior and create safe behavior in the society; moreover, incorporating this belief in educational interventions reduces the severity of the disease and prevents transmission of the disease. In line with the findings of the current study, a study among students showed that perceived severity was a significant predictor of HIV prevention behaviors,^[40] as well a study showed that perceived severity has a more significant relationship with higher motivation for testing and voluntary HIV counseling.^[41] Therefore, it seems that because perceived severity is related to fear and threat, it can be a strong incentive to take preventive behaviors.

The limitations of this study were as follows: (1) cross-sectional design which restricted the ability to create a causal relationship between the cause (FSW's beliefs) and the outcome (FSW's behavior); (2) sampling is done only from prostitutes of Tabriz city, which makes limited generalizability to other cities; and (3) it is possible that the information would have not been properly recorded from the participants due to the nature of the questions, which can be partially controlled by emphasizing the confidentiality and not entering the names of the participants in the questionnaire. The strengths of this research are the novelty of the subject and conducting multiple analyses for controlling confounding factors. As a result, it is suggested that this study be conducted with more sample sizes in other settings including prisons and other cities and in other community groups, especially among those at an early age such as adolescents, to prevent high-risk behaviors. In addition, it is recommended that this

study be performed among HIV/AIDS-infected FSWs to investigate the barriers to preventive behaviors, and future studies should include educational interventions to enhance the perceived benefits of adopting HIV/AIDS prevention behaviors and the perceived severity of HIV/AIDS.

Conclusion

The results showed the importance of strengthening the perceived severity, perceived benefits, self-efficacy, and HIV knowledge, as an effective strategy for increasing BP. Based on the results of this study, it can be said that perceived severity and perceived benefits can lead to HIV preventive behaviors. Midwives, as providers of reproductive and sexual health education to FSWs at vulnerable women's counseling centers, have the best opportunity to help improve the health and quality of life of this group. Therefore, the findings of this study will be used in different aspects of community-based midwifery, clinical services, and health planning and counseling. Further studies are recommended to include educational intervention to enhance the perceived benefits of adopting HIV/AIDS preventive behaviors and the perceived severity of HIV/AIDS.

Acknowledgment

The present manuscript was extracted from the MSc thesis (No. 821, Ethics Code: IR.TBZMED.REC.1397.329). The study was supported by Tabriz University of Medical Sciences, School of Nursing and Midwifery. We would like to express our gratitude to the participants for their contribution to the study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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