Research Article

Pregnant Women's Knowledge and Beliefs About Voluntary HIV Counseling and Testing in Birjand in 2018: An Assessment Using Health Belief Model

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Abstract

Background: Pregnant women are at increased risk of HIV acquisition, whose rapid diagnosis not only saves the lives of the mother and fetus and prevents the infection of the husband, but also prevents the transmission of the virus to other people in the community.

Objectives: In this line, this study aimed to assess pregnant women's knowledge and beliefs in Birjand about voluntary HIV counseling and testing based on health belief model constructs.

Methods: In this descriptive-analytical study, 238 pregnant women referring to Birjand comprehensive health centers (CHC) in 2018 are studied. Participants were selected using multi-stage random sampling. First, Birjand was divided into four districts as north, south, east, and west. Then, one health center and one CHC were selected from each district. Data were collected using a researcher-made questionnaire consisting of demographic information, knowledge, model constructs, and behavior, whose validity and reliability were determined. Data were analyzed using SPSS19 and independent t-test and one-way ANOVA.

Results: The mean age of participants was 28.3 + 5.1 years. Mean score of knowledge, susceptibility, severity, benefits, barriers and perceived self-efficacy were 5.9 + 3.6, 8.9 + 2.21, 23.7 + 4.7, 34.7 + 4.2, 28.2 + 5.9, and 24.5 + 7.3 respectively and behavior was determined to be 5%. Knowledge was evaluated to be poor in 1.7%, moderate in 51.7%, and good in 46.6%. There was a significant negative relationship between barriers and all model constructs ($P < 0.05$) and a significant positive relationship between knowledge with perceived susceptibility ($r = 0.15$) and guidance for action ($r = 0.2$), susceptibility with perceived severity ($r = 0.23$).

Conclusions: This study showed the insufficiency of pregnant women's knowledge about the importance of HIV screening. Therefore, it is recommended to use the Health Belief model in CHC to improve the knowledge, attitude, and practice of this target group.

Keywords: HIV, Pregnant Women, Health Belief Model, Knowledge

1. Background

Nowadays, HIV, a virus that causes AIDS, is one of the major public health challenges worldwide (1). Iran is at a critical stage of the AIDS epidemic, and the country is facing the third wave of the disease, mainly through unsafe sexual intercourse (2).

So far, more than 32 million people have died of AIDS, and in 2018 nearly 1.3 million pregnant women were infected with HIV (3). According to the World Health Organization report in 2014, about 1.5 million pregnant women had AIDS at that time. The feminization of the HIV/AIDS epidemic is directly associated with an increased number of infected children through vertical transmission of the disease (2).

Since the prevalence of HIV/AIDS is on the rise among Iranian women, who most of them are at fertile age (2), special attention should be paid to the mother-to-child (MCTC) transmission and its effective prevention methods as well as ethical considerations. Given the limitations of HIV screening-related resources, we recommend offering HIV testing to every pregnant woman at the first clinic visit by providing enough information and respecting their willingness (4). The most important obstacle to effective prevention of HIV/AIDS is the insufficiency of knowledge about different aspects of the disease. Therefore, understanding the level of knowledge of various target groups can be considered as the first step in designing educa-

tional interventions ([5](#)). Several studies have reported that knowledge about HIV/AIDS, and voluntary counseling and testing are key strategies in managing and preventing HIV ([6](#)). A number of models are proposed for behavior change, which one of the effective models specially developed for health education is the Health Belief model (HBM). In this model, behavior is a function of perceived knowledge and attitude. Based on the constructs of the HBM, it predicts behaviors by accounting health threats and driving the behaviors toward health. Therefore, for adopting AIDS prevention behaviors (primary prevention), people first have to feel threatened (perceived susceptibility), then understand the depth of risk and the seriousness of its various side effects (perceived severity), with the positive symptoms they receive from their surroundings (cues to action) they will believe the usefulness and applicability of preventive behaviors (perceived benefits), finding should find factors that prevent these behaviors are also less costly than their benefits (perceived barriers) and also should be able to perform preventive behaviors (perceived self-efficacy) until so that they finally, to achieve the proper performance in the field of AIDS prevention ([7](#)). So that they finally take the appropriate measures in preventing AIDS.

2. Objectives

Based on the aforementioned, pregnant women are at increased risk of HIV acquisition, whose rapid diagnosis not only saves the lives of the mother and fetus and prevents the infection of the husband but also prevents the transmission of the virus to other people in the community. In this line, the present study aimed to assess pregnant women's knowledge and beliefs in Birjand about voluntary HIV counseling and testing based on health belief model constructs.

3. Methods

In this cross-sectional descriptive-analytic study, 238 pregnant women referring to comprehensive health centers (CHC) of Birjand in 2018 are studied. Those who were not willing to participate or did not complete the questionnaire completely were excluded from the study. Participants were selected using multi-stage random sampling. First, Birjand was divided into four districts (north, south, east, and west). Then, one health center and one CHC were selected from each district. Afterward, 50 pregnant women referring to midwives to receive consultation were selected from each district by easy non-probability sampling method. Then, participants were asked to fill the questionnaire. The sample size was calculated as 238, based on the purpose of determining the frequency distribution of voluntary HIV testing, ratio estimation formula, and the methodology followed by Almo et al. ([8](#)) study ($\propto = 0.05$; P = 0.67; d = 0.06).

Data were collected using a researcher-made questionnaire, which was developed based on the literature review and health belief model constructs. It consists of demographic items (age, delivery mode, number of children, education of the pregnant women and her husband, history of drug injections, tattoos, ... (13 questions)), knowledge items (with correct, false, and do not know choices (15 questions)), perceived susceptibility and severity items (11 questions), perceived benefits (9 questions), perceived barriers (10 questions), self-efficacy (7 questions), and cues to action (5 questions).

Three-choice questions (yes, no, and don't know) were used to assess the knowledge of participants, which for correct answer a score of 2, for false answer a score of zero, and don't know a score of one was considered. A five-point Likert scale (completely agree to completely disagree) was used to measure the health belief model's constructs. In the construct of self-efficacy, five options were used (not sure, a little confident, moderately confident, very confident, completely confident), the scores of these answers ranged from one to five, respectively.

Scores generally ranged from 0 to 30. In perceived susceptibility from 3 to 15, in perceived severity from 8 to 40, in perceived benefits from 9 to 45, in perceived barriers from 10 to 50, and in self-efficacy from 7 to 35. Scores less than 50% of the total score were considered as weak, between 50 to 75% of the total as moderate, and above 75% of the total score were classified as a good level.

Using opinions of 10 university professors of the School of Public Health of the Birjand University of Medical Sciences, the validity of the questionnaire was assessed (CVI = 0.97 and CVR = 0.86). To assess the reliability of the construct questions, the questionnaire was completed by 29 pregnant women referring to CHCs. For each construct, the Cronbach's alpha was as follows: perceived susceptibility 0.71, perceived severity 0.72, perceived benefits 0.60, perceived barriers 0.65, self-efficacy 0.91, and total constructs 0.73.

Before completing the questionnaire, the required information on how to respond to the questions were provided to participants. The questionnaire was completed as a self-report.

The data were entered into SPSS version 19 and were analyzed using descriptive statistics. First, the normality of the distribution of data was evaluated. Independent *t*-test, one-way ANOVA, and Tukey post hoc tests were used to analyze the data. A P value of < 0.05 was considered statistically significant.

4. Results

In this study, 238 pregnant women with a mean age of 28.3 ± 5.1 years were studied. The youngest and oldest participants were 16 and 42 years, respectively. Of 238 pregnant women, 20 (8%) had primary and guidance education degrees, 89 (37%) had a high-school degree, and 129 (54%) had a university degree. Also, 186 (78%) were housewives, and the rest were employed. The mean score of each construct was as follow knowledge 5.9 ± 3.6, perceived susceptibility 8.9 ± 2.21, perceived severity 23.7 ± 4.7, perceived benefits 34.7 ± 4.2, perceived barriers 28. 2 ± 5.9, self-efficacy 24.5 ± 7.3, and guideline for operation 1.8 ± 1.3.

The mean score of knowledge and perceived susceptibility was directly associated with a higher level of education. While for perceived barriers, this association was indirect. According to the results of the Turkey test, the difference between university degrees and the other three levels was significant (P < 0.001). Also, for the perceived barriers construct, the Tukey test showed a significant difference between the elementary degree and other degrees (Table 1).

As shown in Table 2, the mean score of knowledge 2 was significantly higher in employed women than in housewives (P = 0.008).

The association between model structures is presented in Table 3, which indicates a significant negative association between barriers and all model structures (P < 0.05) and a significant positive association between knowledge with perceived susceptibility, cues to action, sensitivity, and perceived severity.

Knowledge in 46.6% of cases, perceived sensitivity 14.3%, perceived severity 6.7%, perceived benefits 49.6%, perceived barriers 25.2%, and self-efficacy in 45.8% were categorized as good (Table 4).

Concerning the cues to action, the most popular channel (used by 150 subjects or 63%) to obtain the required information about HIV was media, followed by 94 (39%) through announcements and posters at CHCs or physical advertisements.

5. Discussion

This study showed that 47% of pregnant women had good knowledge about HIV, and there was a correlation between knowledge and perceived susceptibility constructs. This means that targeted efforts to raise people's knowledge as a moderating factor can improve scores on HBM constructs and, eventually, leads to improved behavior.

Also, the relatively lower level of housewife women's awareness about HIV compared to their employed counterparts indicates the necessity of focusing educational programs on this group. The results reported by Asaduzzaman et al. (9), Olwoker et al. (10), Heshmati et al. (11) about the knowledge of housewife women are consistent with this study. Since perceived susceptibility is the most important predictor of behavior (12), and in this study, 14% of pregnant women had good perceived sensitivity (55% were moderate), this finding indicates the susceptibility of this group to HIV infection. On the other hand, mothers' low knowledge has reduced their sensitivity. Studies by Khani-Jeihouni et al. (13) and Heshmati et al. (11) are in agreement with the above findings, but in the study by Pirzadeh et al. (14) participants were highly sensitive.

Despite low perceived susceptibility in mothers under study, perceived severity was moderate for 73% of the participants, which shows their understanding of the seriousness of the disease and the irreversible consequences of AIDS. While this is notable, it also indicates that mothers do not consider themselves as much at risk as they consider the disease to have severe consequences.

However, since pregnant women who participated in the current study were not considering themselves at increased risk of HIV acquisition, the finding seems to be realistic. This result is consistent with the study of Heshmati et al. (11), but inconsistent with Pirzadeh et al. (14).

For most pregnant women, the perceived barrier to HIV testing was about 70% and the mean score of the construct was not satisfying. This indicates that people cannot overcome these barriers. It also reveals the social stigma towards HIV-positive individuals and low knowledge about the disease, that was mentioned earlier. Which in turn creates barriers for preventive behaviors, including HIV testing. And indicates the need for increasing the awareness of society to remove or reduce these barriers. The results of this study were in line with the results of Mahdavifar et al. (15) and Khani-Jeihouni et al. (13).

Self-efficacy is the principle that links one's knowledge, behavior, and beliefs about behavior. Not only awareness about the causes of behavior is necessary, but also we should be able to do that behavior. In the current study, the mean score of self-efficacy was somehow desirable, which is in line with the findings of Mahdavifar's (15). Voluntary HIV testing was positively associated with educational attainment, which is consistent with the study of Alamo et al. (8) and Matenga et al. (16). In this study, 5% of women were willing to perform the HIV screening test. Montazeri argued that even when the benefits are well-perceived, behavior change is still difficult as long as the perceived barriers are not removed (15).

5.1. Conclusions

The only method to curb the HIV epidemic and meeting goals announced by the WHO is the elimination of social stigma towards HIV, which subsequently promotes using screening tests and receiving treatment. Since the

Table 1. Comparison of Mean Scores of Health Belief Model Constructs by Educational Level of Pregnant Women[a]

Model Structures	Level of Education				
	Elementary (N = 10)	Guidance (N = 10)	High School (N = 89)	Academic (N = 129)	P Value[b]
Knowledge	19 ± 2.9	19.4 ± 3.4	21.1 ± 3.5	22.8 ± 3.4	0.0001
Perceived susceptibility	7.7 ± 1.9	8.5 ± 1.7	8.2 ± 2.3	9.5 ± 2.6	0.001
Perceived severity	23.7 ± 7.1	23.9 ± 5.4	23.2 ± 4.6	23.9 ± 4.7	0.74
Perceived benefits	34.2 ± 4.9	34.1 ± 5.2	35.2 ± 4.7	34.5 ± 4.1	0.65
Perceived Barrier	32.1 ± 3.8	27.9 ± 6.7	29.1 ± 6.2	27.3 ± 5.6	0.02
Self efficacy	22.8 ± 6.9	27.8 ± 6.4	24.1 ± 7.9	24.6 ± 7.1	0.42
Cuse to action	1.8 ± 1.4	1.9 ± 1.4	1.9 ± 1.4	1.8 ± 1.3	0.88

[a]Valeus are expressed as X ± SD.
[b]ANOVA.

Table 2. Comparison of Mean Score of Health Belief Model by Job in Pregnant Women[a]

Model Structures	Job		
	Housewife (N = 186)	Employed (N = 52)	P Value[b]
Knowledge	21.6 ± 3.5	23 ± 3.5	0.008
Perceived susceptibility	8.8 ± 2.4	9.1 ± 2.9	0.4
Perceived severity	23.5 ± 4.7	24.4 ± 4.7	0.19
Perceived benefits	34.7 ± 4.6	34.7 ± 3.9	0.99
Perceived barrier	28.5 ± 5.9	27 ± 5.8	0.11
Self efficacy	24.2 ± 7.4	25.6 ± 7.2	0.19
Cuse to action	1.85 ± 1.27	1.85 ± 1.46	0.98

[a]Valeus are expressed as X ± SD.
[b]*t*-test.

Table 3. Estimation of Pearson Correlation Coefficient between Health Belief Model Structures in Pregnant Women Study

Variable	Variable						
	Knowledge	Perceived Susceptibility	Perceived Severity	Perceived Benefits	Perceived Barrier	Self Efficacy	Cuse to Action
Knowledge	1	r = 0.15; P = 0.03	r = -0.08; P = 0.25	r = 0.09; P = 0.15	r = -0.11; P = 0.08	r = 0.04; P = 0.51	r = 0.2; P = 0.002
Perceived susceptibility	r = 0.14; P = 0.02	1	r = 0.23; P < 0.001	r = 0.04; P = 0.54	r = -0.19; P = 0.002	r = 0.07; P = 0.27	r = -0.04; P = 0.55
Perceived severity			1	r = 0.01; P = 0.88	r = -0.45; P ≤ 0.001	r = 0.2; P = 0.002	r = 0.07; P = 0.25
Perceived benefits				1	r = -0.04; P = 0.57	r = 0.15; P = 0.02	r = 0.23; P < 0.001
Perceived barrier					1	r = -0.31; P < 0.001	r = -0.01; P = 0.86
Self efficacy						1	r = 0.05; P = 0.47

most effective way against HIV is health education and without increasing the knowledge and self-efficacy and decreasing barriers that pregnant women are faced with, it is impossible to increase the utilization of HIV screening tests. Thus, based on the results, it is recommended to use the HBM in CHC to improve knowledge, attitude, and practice of pregnant women.