**Research Article**

# Safe Sex; Knowledge and Behavior Assessment in Patients with Severe Mental Illnesses

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### Abstract

**Introduction:** It seems patients with severe mental illnesses (SMI) are more prone to sexual health complications than general population due to loss of skills, partially impaired judgment and experience of some cognitive deficits. This study aims to explore safe sex knowledge and behavior in these patients in order to determine their need for safe sex education.

**Methods:** The levels of knowledge and behavior were assessed with validated "Safe Sex Knowledge and Behavior Questionnaire for Patients with Severe Mental Illnesses" (SSKBQ-SMI) in 265 SMI patients in Roozbeh Psychiatric Hospital, Tehran, Iran. Data were statistically analyzed with SPSS.

**Results:** The mean score of knowledge in 265 patients was 8.901 (SD=3.863) out of 16 and it was significantly related to age, education, occupation, number of hospitalizations, history of substance use, history of hearing about sexually transmitted infections (STIs), history of having intercourse, and sources of safe sex information. The mean score of sexual behavior in 90 patients was 13.922 (SD=3.383) out of 48 and it was significantly related to the history of substance use and the knowledge scores.

**Conclusion:** SMI patients had a lack of knowledge in different sexual health aspects and had high-risk behaviors. The higher levels of knowledge in these patients did not necessarily lead to safer sexual behavior, so it is recommmended to design appropriate interventions in order to increase their knowledge and improve their behavior in this regard.

## INTRODUCTION

Severe mental illnesses (SMIs) are psychiatric disorders such as schizophrenia, schizoaffective disorder, bipolar mood disorder, etc. [1-4], that have chronic psychiatric symptoms and require at least a short period of hospitalization [5]. These patients have several problems, some of which are related to sexual health issues [5]. These patients are mostly sexually active and in most studies, they have been identified as having high-risk sexual behaviors [1,3,5-9]. These behaviors include unprotected sex, sexual contact with multiple partners or high-risk individuals such as sex workers, sex trade, etc., which can cause harm to the patients themselves or others [1,3,5-9]. One important problem in SMI patients is sexually transmitted infections (STIs), especially HIV infection [2-4,7,10-14].

Several factors are involved in the development of high-risk sexual behaviors in these patients [15]. The first issue is their psychiatric symptoms [11]. For example, bipolar patients with mania have increased sexual desires, thoughts and behaviors, which, along with behavioral disinhibition and increased self-esteem, can lead them to high-risk behaviors [4,9]. Also, many

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SMI patients have impairments in their cognition, attention, information processing, and social skills due to their illness, which puts them at risk [3,11,12]. For these reasons, SMI patients are more prone to sexual harassment [1,9,11,16]. Another important problem in SMI patients is substance abuse [3,5-8,17], which makes them more likely to engage in casual and unprotected sexual relationships and sex trade for substance or money [3,7].

Generally, mental health services ignore SMI patients' sexual health issues [4,18] and the Iranian mental health care providers are no exception [19]. Furthermore, due to the lack of self-confidence and social skills, these patients have difficulty in talking about safe sex [3,9,11]. Several sex education interventions outside of Iran have been shown to be effective in improving safe sex knowledge, attitude and behavior in SMI patients [11]. Knowing the level of safe sex knowledge and behavior in these patients is considered as part of the needs assessment to improve the quality of health services. According to our searches in common databases, no study has been conducted for this purpose in Iran. The authors of this study intended to do this basic needs assessment for the first time in Iran, by determining the level of knowledge and behavior about safe sex in SMI patients referred to Roozbeh Psychiatric Hospital, as part of psychiatric patients in the country.

## MATERIALS & METHODS

### Research Setting & Participants

This cross-sectional study was conducted over a period of one year in 2018 and 2019 in Roozbeh Psychiatric Hospital, affiliated to Tehran University of Medical Sciences, Iran. Participants were recruited by the non-probability convenient sampling method among patients admitted to 7 wards of Roozbeh Hospital with an inclusion criteria. The study inclusion criteria were: 1) having one of the diagnoses of schizophrenia, schizoaffective disorder or bipolar disorder, 2) not being in an acute uncontrolled phase of mental illness, 3) age from 18 to 45 years, and 4) minimum level of fifth grade education. According to the research team decision, only patients who had sex with anyone other than their spouse in the one past year had to answer the questions of safe sex behavior. The formula for estimating the sample size to evaluate a quantitative variable was used to estimate the adequate sample size, by using the standard deviation of 16.6 (3). The required sample size was 265 participants.

### Data Collection

The assessment instrument used in this research was "Safe Sex Knowledge and Behavior Questionnaire for Patients with Severe Mental Illnesses" (SSKBQ-SMI), a validated researcher developed the questionnaire consisting of three main parts: 1) demographic questions; 2) items evaluating safe sex knowledge, consisting of 16 "True/False" statements with one score for each correct answer and a total score from 0 to 16; 3) items evaluating safe sex behavior in one past year, consisting of 16 Likert-scale questions with a score range of 0 to 3 per item and a total behavior score range of 0 to 48, with a lower score defining safer behavior.

The correlation coefficient of the questionnaire scores in the reliability assessment with the test-retest method in the sections of knowledge and behavior was 0.880 and 0.951, respectively. The calculation of Cronbach's alpha coefficient for the sections of knowledge and behavior and whole questionnaire was 0.809, 0.756 and 0.782, respectively. Questionnaires were filled out on a self-report basis. After filling out the questionnaires, they were re-examined by the researchers to check unanswered questions and none of the questionnaires were excluded.

### Ethical Approval

The study was approved by the Ethical Committee of the Research Council of Tehran University of Medical Sciences (Number: IR.TUMS.MEDICINE.REC.1397.417), Tehran, Iran. Study participants were personally informed regarding the aims and the importance of the study. Participants signed informed consent letters. None of the participants needed a guardian to sign the consent form.They were assured regarding the anonymity and confidentiality of their information, and that they were free to either participate in or withdraw from the study. No time limit was imposed to complete the questionnaires. It took approximately 30 minutes to complete the questionnaire.

### Data Analysis

The data were transferred into IBM SPSS Statistics 24 file. Descriptive statistical tests were executed to analyze demographic information and then screened to evaluate the possibility of using parametric statistics. Finally, the data obtained from the study were evaluated by selecting an appropriate statistical test for inferential statistical analysis in terms of the relationship between independent and dependent variables. Only the scores of safe sex knowledge and behavior were considered as dependent variables in this study.

## FINDINGS

### Participants' Characteristics

The sample size of 265 SMI patients participated in this study, including 147 men with a mean age of 31.68 (SD=7.39) years and 118 women with a mean age of 30.39 (SD=7.22). All of the participants filled out the knowledge part of the questionnaire (Group A). Additional information on the independent variables is shown in the first and second columns of Tables 1 and 2.

Out of a total of 265 patients in this study, only 90 patients answered the behavior part of the questionnaires due to having sex with someone other than their spouse (Group B). These 90 patients had a mean age of 27.94 (SD=6.60) years, including 52 men with a mean age of 28.67 (SD=6.78) years and 38 women with a mean age of 26.94 (SD=6.31) years. Additional information on the independent variables is shown in the first and second columns of Tables 3 and 4.

### Safe Sex Knowledge and Behavior Scores

The mean of safe sex knowledge scores in 265 patients of Group A was 8.90 (SD=3.86) out of 16 (8.93 (SD=3.66) in men and 8.86 (SD=4.11) in women). The means of safe sex knowledge

**Table 1:** Demographic Data and Knowledge Scores in Participant who answered only knowledge questions (Group A, n=265)

| Independent Variables | | Knowledge Score* (Mean ± Sd**) | Relation with Knowledge Score | |
|---|---|---|---|---|
| Variables | Value | | P Value | Statistical Index |
| **Age** (year) | | | | |
| Mean ± Sd | 31.11± 7.33 | 8.90 ± 3.86 | **0.002**[a] | **bτ = -0.132** |
| **Age at SMI Onset** (year) | | | | |
| Mean ± Sd | 21.48 ± 8.03 | 8.90 ± 3.86 | 0.079[a] | bτ = +0.077 |
| **Age at Treatment Onset** (year) | | | | |
| Mean ± Sd | 23.29 ± 7.14 | 8.90 ± 3.86 | 0.434[a] | bτ = +0.034 |
| **Number of Admissions due to SMI** | | | | |
| Mean ± Sd | 2.41 ± 1.85 | 8.90 ± 3.86 | **<0.001**[a] | **bτ = -0.270** |
| **Gender** (n) | | | 0.934[b] | - |
| Male | 147 | 8.93 ± 3.66 | | |
| Female | 118 | 8.86 ± 4.11 | | |
| **Marital Status** (n) | | | 0.395[c] | - |
| Married | 83 | 9.32 ± 3.83 | | |
| Single | 170 | 8.69 ± 3.85 | | |
| Divorced / Widow | 12 | 8.91 ± 4.20 | | |
| **Educational Status** (n) | | | **<0.001**[c] | - |
| Less than high school | 90 | 6.86 ± 3.65 | | |
| High school | 124 | 8.28 ± 3.24 | | |
| Higher than high school | 51 | 11.56 ± 3.76 | | |
| **Occupational Status** (n) | | | **<0.001**[b] | - |
| No | 175 | 8.23 ± 3.87 | | |
| Yes | 90 | 10.20 ± 3.52 | | |
| **Income Status** (n) | | | **<0.001**[c] | - |
| Mostly Independent to Others | 59 | 10.40 ± 3.15 | | |
| Moderately Dependent to Others | 64 | 9.73 ± 3.79 | | |
| Mostly Dependent to Others | 142 | 7.90 ± 3.89 | | |
| **Type of Mental Illness** (n) | | | 0.079[c] | - |
| Bipolar Mood Disorder | 173 | 9.08 ± 3.79 | | |
| Schizophrenia | 68 | 8.05 ± 4.03 | | |
| Schizoaffective Disorder | 24 | 9.95 ± 3.60 | | |
| **Substance/Alcohol Use in One Past Year** (n) | | | **<0.001**[b] | - |
| No | 174 | 8.16 ± 3.66 | | |
| Yes | 91 | 10. 31 ± 3.85 | | |

*Range from 0 to 16; Higher score shows higher knowledge; **Standard Deviation; a. Kendall Correlation Coefficient; b. Mann-Whitney U; c. Kruskal-Wallis One-way ANOVA

scores in other subgroups based on other independent variables are shown in the third column of Tables 1 and 2.

Also, the mean of safe sex knowledge scores in 90 patients in Group B was 9.94 (SD=3.65) (10.30 (SD=3.29) in men and 9.44 (SD=4.09) in women). The mean of safe sex behavior scores in this group was 13.92 (SD=6.38) (14.42 (SD = 6.42) in men and 13.23 (SD=6.35) in women). Other means of these scores in other subgroups based on other independent variables are shown in the third column of T 3 and 4.

## Impact of Independent Variables on Sexual Knowledge and Behavior Scores

Based on the results of statistical analysis of the relations between safe sex knowledge scores and independent variables of the study, it was found that knowledge scores in 265 patients of Group A were significantly related to age, education status, number of hospitalizations, history of substance use in one past year, occupational status, income status, history of having sex during lifetime, hearing about STIs, patients' self-assessment about their own knowledge, learning from the sources mentioned in the questionnaire, including friends, health care providers, books and magazines, radio and television, satellite networks, the Internet and cyberspace, and the history of having sexual intercourse in the one past year. In addition, the knowledge scores were significantly related to the variable of the patient's self-assessment about their safe sex behavior in 200 patients who had a history of sexual intercourse. The reports on the statistical methods used and the p-values computed in these relationships are presented in the last columns of Tables 1 and 2.

In 90 patients of Group B, the safe sex knowledge scores were significantly related to the variables of educational status, number of hospitalizations, history of substance use in the one past year, occupational status, income status, hearing about STIs, patients' self-assessment about their own knowledge, learning from the sources mentioned in the questionnaire, including of health care providers, books and magazines, satellite networks, Internet and cyberspace and patients' self-assessment of their safe sex behavior. Regarding the relationship between knowledge scores and income status, there was a significant difference between the group of patients who were mostly dependent on others and the

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**Table 2:** Intercourse History, Self-Assessments, Information Resources and Knowledge Scores in Participant who answered only knowledge questions (Group A, n=265)

| Independent Variables | | Knowledge Score* (Mean ± Sd**) | Relation with Knowledge Score | |
|---|---|---|---|---|
| **Variables** | **Value** | | **P Value** | **Statistical Index** |
| **History of Having Intercourse** (n) | | | | |
| Whole Life | | | **<0.001**[a] | - |
| No | 65 | 6.92 ± 3.61 | | |
| Yes | 200 | 9.54 ± 3.72 | | |
| One Past Year | | | **<0.001**[b] | - |
| No | 95 | 7.58 ± 3.76 | | |
| Just with their spouse | 80 | 9.28 ± 3.80 | | |
| With other than their spouse | 90 | 9.94 ± 3.65 | | |
| **Ever Heard About STIs** (n) | | | **<0.001**[a] | - |
| No | 91 | 6.65 ± 3.49 | | |
| Yes | 174 | 10.07 ± 3.52 | | |
| **Self-Assessment about Own Safe Sex Knowledge** (n) | | | **<0.001**[c] | bτ=+0.454 |
| Very Low | 42 | 5.19 ± 3.79 | | |
| Low | 70 | 7.31 ± 3.21 | | |
| Moderate | 83 | 9.85 ± 2.91 | | |
| High | 44 | 11.54 ± 2.89 | | |
| Very High | 26 | 11.65 ± 3.12 | | |
| **Self-Assessment about Own Safe Sex Behavior** (n) | | | **<0.001**[c] | bτ=+0.284 |
| Have No Intercourse History | 65 | 6.92 ± 3.61 | | |
| Very Low | 10 | 5.90 ± 3.75 | | |
| Low | 13 | 7.61 ± 3.79 | | |
| Moderate | 59 | 8.67 ± 3.79 | | |
| High | 55 | 9.63 ± 3.70 | | |
| Very High | 63 | 11.25 ± 2.94 | | |
| **Safe Sex Education Request** (n) | | | 0.149[a] | - |
| No | 115 | 8.40 ± 4.46 | | |
| Yes | 150 | 9.28 ± 3.29 | | |
| **Safe Sex Information Resources** (n) | | | | |
| Parents | 46 | 9.10 ± 3.43 | 0.672[a] | - |
| Siblings | 33 | 9.81 ± 2.45 | 0.224[a] | - |
| Spouse | 43*** | 8.81 ± 3.75 | 0.836[a] | - |
| Other Relatives | 21 | 9.90 ± 3.94 | 0.169[a] | - |
| Friends | 106 | 9.83 ± 4.09 | **0.003**[a] | - |
| Health Providers | 36 | 10.97 ± 2.94 | **<0.001**[a] | - |
| School Teachers | 33 | 10.00 ± 2..91 | 0.111[a] | - |
| Books/Magazines | 106 | 10.54 ± 3.18 | **<0.001**[a] | - |
| National Radio/TV | 101 | 9.59 ± 3.66 | **0.026**[a] | - |
| Satellite Channels | 107 | 10.56 ± 3.24 | **<0.001**[a] | - |
| Internet/Cyberspace | 97 | 10.123 ± 3.13 | **<0.001**[a] | - |
| None of the Above/Other Resources | 21 | 4.19 ± 9.30 | **<0.001**[a] | - |

*Range from 0 to 16; Higher score shows higher knowledge; **Standard Deviation; ***.Only 95 patients have a history of marriage; a. Mann-Whitney U; b. Kruskal-Wallis One-way ANOVA; c. Kendall Correlation Coefficient

group of patients who were mostly independent or moderately dependent on others, using Bonferroni post hoc test (p=0.001 and p=0.037). Furthermore, the safe sex behavior scores in these 90 patients were significantly related to the variables of the history of substance use in the one past year and patients' self-assessment about their sexual behavior. Additionally, the knowledge scores of these patients had a significant relationship with the behavior scores. The reports on the statistical methods used and the p-values computed in these relationships are presented in the last columns of Tables 3 and 4.

## DISCUSSION

According to the results of this study, most of the SMI patients had a correct self-assessment about their own safe sex knowledge and behavior, which means that SMI patients have relative awareness of their condition, even if this awareness is low. The higher level of knowledge about safe sex is directly related to younger age, higher education, employment and financial self-sufficiency, fewer hospitalizations, history of substance use, previous history of having sex, and hearing about STIs. On the contrary, factors such as gender, marital status, age at SMI onset and its treatment, and type of psychiatric disorder were not related to patients' knowledge. Also, it was observed that receiving information about safe sex from sources such as friends, health care providers, books and magazines, national radio and television, satellite networks, the Internet and cyberspace can increase the knowledge of these patients,

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**Table 3:** Demographic Data and Knowledge Scores in Participant who answered both knowledge and behavior questions (Group B, n=90)

| Independent Variables | | Knowledge Score* (Mean ± Sd**) | Relation with Knowledge Score | | Behavior Score*** (Mean ± Sd) | Relation with Behavior Score | |
|---|---|---|---|---|---|---|---|
| Variables | Value | | P Value | Statistical Index | | P Value | Statistical Index |
| **Age** (year) | | | | | | | |
| Mean ± Sd | 27.94 ± 6.60 | 9.94 ± 3.65 | 0.194ᵃ | r=-0.138 | 13.92 ± 6.38 | 0.479ᵃ | r=+0.076 |
| **Age at SMI Onset** (year) | | | | | | | |
| Mean ± Sd | 19.83 ± 6.06 | 9.94 ± 3.65 | 0.096ᵃ | r=+0.176 | 13.92 ± 6.38 | 0.597ᵃ | r=-0.057 |
| **Age at Treatment Onset** (year) | | | | | | | |
| Mean ± Sd | 21.43 ± 5.41 | 9.94 ± 3.65 | 0.196ᵃ | r=+0.137 | 13.92 ± 6.38 | 0.515ᵇ | r=-0.049 |
| **Number of Admissions due to SMI** | | | | | | | |
| Mean ± Sd | 2.66 ± 1.90 | 9.94 ± 3.65 | **0.003ᵃ** | **r=-0.310** | 13.92 ± 6.38 | 0.106ᵇ | bτ=+0.132 |
| **Gender** (n) | | | 0.373ᶜ | - | | 0.333ᵈ | t=+0.973 |
| Male | 52 | 10.30 ± 3.29 | | | 14.42 ± 6.42 | | |
| Female | 38 | 9.44 ± 4.09 | | | 13.23 ± 6.35 | | |
| **Marital Status** (n) | | | 0.982ᵉ | - | | 0.529ᵉ | - |
| Married | 3 | 10.33 ± 5.50 | | | 15.00 ± 6.00 | | |
| Single | 81 | 9.92 ± 3.61 | | | 14.06 ± 6.45 | | |
| Divorced / Widow | 6 | 10.00 ± 4.09 | | | 11.50 ± 5.99 | | |
| **Educational Status** (n) | | | **<0.001ᵉ** | - | | 0.255ᶠ | - |
| Less than high school | 27 | 7.55 ± 3.27 | | | 16.22 ± 7.87 | | |
| High school | 42 | 10.42 ± 2.95 | | | 12.90 ± 5.27 | | |
| Higher than high school | 21 | 12.04 ± 3.84 | | | 13.00 ± 5.79 | | |
| **Occupational Status** (n) | | | **0.001ᵈ** | **t=+3.359** | | 0.694ᵈ | t=+0.395 |
| No | 58 | 9.03 ± 3.72 | | | 13.77 ± 6.77 | | |
| Yes | 32 | 11.59 ± 2.90 | | | 14.18 ± 5.68 | | |
| **Income Status** (n) | | | **<0.001ᵉ** | - | | 0.748ᶠ | - |
| Mostly Independent to Others | 19 | 12.21 ± 2.61 | | | 14.94 ± 6.98 | | |
| Moderately Dependent to Others | 22 | 10.86 ± 2.93 | | | 13.18 ± 5.05 | | |
| Mostly Dependent to Others | 49 | 8.65 ± 3.78 | | | 13.85 ± 6.73 | | |
| **Type of Mental Illness** (n) | | | 0.552ᵉ | - | | 0.488ᵉ | - |
| Bipolar Mood Disorder | 67 | 9.89 ± 3.83 | | | 13.47 ± 6.22 | | |
| Schizophrenia | 14 | 9.42 ± 3.56 | | | 15.64 ± 5.96 | | |
| Schizoaffective Disorder | 9 | 11.11 ± 2.08 | | | 14.55 ± 8.29 | | |
| **Substance/Alcohol Use in One Past Year** (n) | | | **0.005ᵈ** | **t=+2.852** | | **<0.001ᵈ** | **t=+4.296** |
| No | 44 | 8.86 ± 3.38 | | | 16.39 ± 6.51 | | |
| Yes | 46 | 10.97 ± 3.63 | | | 11.34 ± 5.15 | | |

*Range from 0 to 16; Higher score indicates higher knowledge; **Standard Deviation; ***Range From 0 to 48; Lower score indicates safer behavior; a. Pearson Correlation Coefficient b. Kendall Correlation Coefficient; c. Mann-Whitney U; d. Independent t-test; e. One-way ANOVA & Bonferroni Post hoc; f. Kruskal-Wallis One-way ANOVA

however family sources were not effective. Finally, it was found that higher levels of knowledge could lead to slightly safer sexual behavior, however, none of the factors associated with more knowledge were directly associated with safer sexual behavior. Meanwhile, only the history of substance use in the past one year was associated with more risky sexual behavior.

As mentioned, patients' gender and type of psychiatric disorder had no significant relationship with their levels of knowledge and sexual behavior, which was similar to other studies [7,20,21]. Also, as expected, patients with lower education had lower levels of knowledge, which was confirmed by other previous studies and also similarly showed the lack of companionship between higher levels of knowledge and safer sexual behavior [22,23]. The present study also confirmed other studies about the association of substance use with higher levels of knowledge and unsafe sexual behavior [7,21,24]. Another case that was in line with another study was the association of lower knowledge with unemployment and patients' financial dependency or, in essence, poverty, which has nothing to do with sexual behavior [25]. As the research team expected, about

the relationship between lifetime sexual experience and higher levels of knowledge, Swanson et al's study was confirmed [22].

One of the important findings of this study, which was contrary to expectations, was the inverse relationship between the safe sex knowledge level and age of SMI patients, so that younger age is associated with more knowledge. In the study of Shokouhi et al. [26] and Swanson et al. [22], the older age was associated with more knowledge. One of the explanations for this difference may be due to the narrow age range selected in these studies. It can also be explained by the chronic nature of SMIs and a greater decline in cognitive functions in older patients. According to what was said about sources of information such as the Internet and satellite networks, which have more sexual content, the higher levels of knowledge at a younger age may be due to the wider use of these resources in younger patients.

Regarding the sources of information about safe sex, it was observed that despite the high importance of family and school as the first and second priority in sex education [27], the use of these sources is less common in these patients, and even to

**Table 4:** Intercourse History, Self-Assessments, Information Resources and Knowledge Scores in Participant who answered both knowledge and behavior questions (Group B, n=90)

| Independent Variables | | Knowledge Score* (Mean ± Sd**) | Relation with Knowledge Score | | Behavior Score*** (Mean ± Sd) | Relation with Behavior Score | |
|---|---|---|---|---|---|---|---|
| Variables | Value | | P Value | Statistical Index | | P Value | Statistical Index |
| **Ever Heard About STIs** (n) | | | **<0.001ᵃ** | **t=+3.634** | | 0.414ᵃ | t=+0.820 |
| No | 26 | 7.88 ± 2.64 | | | 12.92 ± 5.80 | | |
| Yes | 64 | 10.78 ± 3.69 | | | 14.32 ± 6.60 | | |
| **Self-Assessment about Own Safe Sex Knowledge** (n) | | | **<0.001ᵇ** | **r=+0.529** | | 0.247ᶜ | bτ=-0.094 |
| Very Low | 7 | 5.28 ± 3.14 | | | 19.28 ± 6.82 | | |
| Low | 26 | 8.73 ± 2.89 | | | 15.50 ± 7.20 | | |
| Moderate | 28 | 9.67 ± 3.54 | | | 10.85 ± 9.67 | | |
| High | 19 | 12.36 ± 2.56) | | | 13.26 ± 5.53 | | |
| Very High | 10 | 12.50 ± 3.20 | | | 15.90 ± 6.82 | | |
| **Self-Assessment about Own Safe Sex Behavior** (n) | | | **<0.001ᵇ** | **r=+0.430** | | **0.004ᶜ** | **bτ=-0.235** |
| Very Low | 8 | 6.62 ± 3.73 | | | 22.75 ± 7.14 | | |
| Low | 8 | 7.50 ± 4.10 | | | 19.12 ± 5.76 | | |
| Moderate | 33 | 9.69 ± 3.24 | | | 12.66 ± 5.08 | | |
| High | 19 | 10.57 ± 3.62 | | | 11.15 ± 4.54 | | |
| Very High | 22 | 11.86 ± 2.83 | | | 13.92 ± 6.38 | | |
| **Safe Sex Education Request** (n) | | | 0.072ᵈ | - | | 0.929ᵃ | t=-0.089 |
| No | 24 | 10.83 ± 4.45 | | | 14.20 ± 7.15 | | |
| Yes | 66 | 9.62 ± 3.29 | | | 13.81 ± 6.13 | | |
| **Safe Sex Information Resources** (n) | | | | | | | |
| Parents | 16 | 10.25 ± 2.64 | 0.714ᵃ | t=-0.367 | 14.18 ± 5.58 | 0.729ᵃ | t=-0.347 |
| Siblings | 10 | 10.90 ± 1.85 | 0.519ᵈ | - | 14.60 ± 6.67 | 0.654ᵃ | t=-0.449 |
| Spouse | 0 | - | - | - | - | - | - |
| Other Relatives | 9 | 10.22 ± 4.08 | 0.812ᵃ | t=-0.239 | 13.66 ± 4.89 | 0.960ᵃ | t=-0.050 |
| Friends | 52 | 10.42 ± 3.49 | 0.147ᵃ | t=-1.463 | 14.67 ± 5.75 | 0.089ᵃ | t=-1.721 |
| Health Providers | 16 | 11.68 ± 2.89 | **0.035ᵃ** | **t=-2.146** | 13.68 ± 6.73 | 0.804ᵃ | t=+0.276 |
| School Teachers | 16 | 11.12 ± 2.72 | 0.155ᵃ | t=-1.433 | 13.56 ± 5.24 | 0.936ᵃ | t=+0.081 |
| Books/Magazines | 35 | 11.28 ± 3.06 | **0.005ᵃ** | **t=-2.890** | 13.51 ± 6.22 | 0.573ᵃ | t=+0.566 |
| National Radio/TV | 28 | 10.57 ± 3.54 | 0.277ᵃ | t=-1.095 | 13.92 ± 5.55 | 0.927ᵃ | t=-0.092 |
| Satellite Channels | 51 | 11.07 ± 3.11 | **0.001ᵃ** | **t=-3.583** | 13.03 ± 5.04 | 0.338ᵈ | - |
| Internet/Cyberspace | 49 | 10.87 ± 3.07 | **0.015ᵈ** | - | 13.81 ± 5.88 | 0.993ᵃ | t=-0.009 |
| None of the Above/Other Resources | 7 | 6.14 ± 1.77 | **0.004ᵃ** | **t=+2.991** | 16.85 ± 10.52 | 0.298ᵃ | t=-1.047 |
| **Safe Sex Knowledge Score** | | | | | | | |
| Mean ± Sd | 9.94 ± 3.65 | - | - | - | 13.92 ± 6.38 | **0.005ᵇ** | **r=-0.290** |

*Range from 0 to 16; Higher score indicates higher knowledge; **Standard Deviation; ***Range From 0 to 48; Lower score indicates safer behavior; a. Independent t-test b. Pearson Correlation Coefficient; c. Kendall Correlation Coefficient; d. Mann-Whitney U

a small extent that information has been provided in family or school, this information is inefficient and has not improved the levels of knowledge and behavior in these patients. This can be due to the wrong way of presenting information, wrong content, lack of knowledge in parents and teachers, or the weakness of these patients in understanding the correct information [28]. About the role of friends, it can be seen that they were able to increase the scores of the knowledge level, although this relation is not strong. This confirms that people are more influential in their knowledge in friendly communications [26,29-32]. In the case of health care providers, they had been able to significantly increase the knowledge scores in those few patients who had received information from them, which is probably due to more efficient presenting methods and more complete knowledge. Other sources, including the Internet and cyberspace, which are the most widely used sources [26,29-32], all increased the safe sex knowledge in 265 patients in Group A. Comparing the mean scores, it can be seen that the positive effect of national radio and television on increasing knowledge was less than satellite networks, the Internet, and cyberspace. In the case of 90 patients in Group B, it can be seen that the last 3 sources had a significant positive effect on increasing the level of knowledge scores. The point is that in the patients of Group B, the rate of receiving information about sexual issues from the national radio and television decreased and in contrast the users of satellite and cyberspace increased. This may indicate a more fundamental difference between these two groups of patients, which could be the subject of discussion and research. Finally, the important point is that despite the influence of different sources of information on the safe sex knowledge level, patients still did not show a significant difference in their sexual behavior and this increase in the knowledge levels did not lead to safer sexual behavior.

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So far, various studies have been conducted based on different theories about behavior change in special education programs for psychiatric patients. In most of them, it has been shown that educational methods that rely only on increasing information have not been effective and have not improved behavior [11]. One of the most important issues in effective education programs is motivational education, which will help the patients with sufficient knowledge and skills to use them [20]. In this regard, educational studies with focus on information, motivation and skill enhancement, called IMB Model, have been used in several studies and their positive effects have been reported [11]. In many of these studies, these effects have diminished over time in patient follow-ups [20,33], which necessitates continuous education in these patients.

The present study faced some limitations. Because SSKBQ-SMI is a self-report questionnaire, despite its good reliability and validity, it was still possible for patients to misunderstand the meanings of some questions or to answer some by chance. Considering the non-probability sampling method used in this study only in patients admitted to Roozbeh Psychiatric Hospital, which is a referral hospital, can it be said that the participants in this study may not be a good representative sample of patients with severe mental illnesses in society. Also, in this study, only 3 groups of patients with bipolar disorder, schizophrenia and schizoaffective disorder were evaluated and patients with other severe mental illnesses remained unassessed. Another important point is the age of patients as one of the inclusion criteria in the study, which only included patients aged 18 to 45 years and other ages had not been assessed. Therefore, for similar future studies, it is recommended to select the target population from various mental health centers and with a wider age range and more and different mental disorder diagnoses than the present study.

## CONCLUSION, LIMITATIONS & RECOMMENDATIONS

SMI patients had a lack of knowledge in different sexual health fields and have high-risk behaviors. Despite the influence of various individual factors and information sources on increasing the safe sex knowledge in SMI patients, the higher levels of knowledge in these patients did not necessarily lead to safer sexual behavior and it is necessary to design interventions to motivate them in order to increase their knowledge and improve their behavior. In this regard, it is recommended for the future researches to examine the ways to motivate safer sexual behavior in SMI patients.

The present study faced some limitations. Because SSKBQ-SMI is a self-report questionnaire, despite its good reliability and validity, it was still possible for patients to misunderstand the meanings of some questions or to answer some by chance. Considering the non-probability sampling method used in this study only in patients admitted to Roozbeh Psychiatric Hospital, which is a referral hospital, it can be said that the participants in this study may not be a good representative sample of patients with severe mental illnesses in society. Also, in this study, only 3 groups of patients with bipolar disorder, schizophrenia and schizoaffective disorder were evaluated and patients with other

severe mental illnesses remained unassessed. Another important point is the age of patients as one of the inclusion criteria in the study, which only included patients aged 18 to 45 years and other ages were not assessed. Therefore, for similar future studies, it is recommended to select the target population from various mental health centers and with a wider age range and more and different mental disorder diagnoses than the present study.

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