BENTHAM OPEN

CrossMark

The Open Public Health Journal

Content list available at: www.benthamopen.com/TOPHJ/

DOI: 10.2174/1874944501811010339, 2018, *11*, 339-347

RESEARCH ARTICLE

The Necessity of Developing AIDS and Reproductive Health Indicators for Iranian Adolescents in the National Health System; The Evaluation of Indicators among 18-24 Year Old University Students of Shahroud, Iran: A Cross-Sectional Study

Katayon Vakilian[1,*], Afsaneh Keramat[2] and Mousavi Seyyed Abbas[3]

[1]*Nursing Midwifery School, Arak University of Medical Sciences, Arak, Iran*
[2]*Nursing Midwifery School, Shahroud University of Medical Sciences, Shahroud, Iran*
[3]*Medical School, Golestan University of Medical Sciences, Golestan, Iran*

Received: March 6, 2018 Revised: July 21, 2018 Accepted: July 24, 2018

Abstract:

Background and Objectives:

Indicators are required to assess health needs as well as monitor, implement and evaluate the impact of health promotion programs. In the present study, efficacious indicators in the prevention of HIV/AIDS and enhancement of reproductive health were developed and measured.

Materials and Methods:

After creating a database, the indicators were presented to a panel of experts. A total of 28 indicators, which were divided into three domain categories *viz*: "knowledge", "attitude" and "behavior" were developed after prioritization. In the next stage, 1500 male and female students within the age bracket of 18-24 were included after ascertaining the validity and reliability of some of the study's questionnaires. Multistage sampling was employed. After obtaining approval from universities and the respective professors, the questionnaires were distributed to students. Data were analyzed using SPSS software, version 20 and Pearson's descriptive-analytical statistics.

Results:

Responding to whether "AIDS can be transmitted through the use of a previously used toilet by an individual suffering from AIDS" or not, 168 (18.8%) female and 166 (32.0%) male students answered correctly, with the difference being statistically significant ($p = 0.001$). A total of 293 (40.6%) male students believed that the perfect age for males to get married was 26 or under. A total of 157 (30.4%) female and 267 (29.5%) male students believed that the majority of their single friends had never had sexual relations, respectively.

Conclusion:

Planning can be carried out to reduce factors that adversely affect the enhancement of adolescents' reproductive and sexual health through the measurement of such indicators, including educational and service programs that provide a better access to such services for adolescents.

Keywords: HIV, AIDS, Indicator, Reproductive health, Youth, Iran.

* Address correspondence to this author at the Peyambare-Azam campus, Nursing Midwifery School, Arak University of Medical Sciences, Basij squer, Arak, Markazy province, Iran, Tel: 09123249840; E-mail: dr.kvakilian@arakmu.ac.ir

1. INTRODUCTION

Indicators are developed for the assessment of health needs as well as the monitoring, efficacious implementation and evaluation of the impact of programs. Indicators are required to access data that impose a heavy burden on the healthcare system. Therefore, development and selection of indicators prevent their invalidated and untested use. Selection of indicators may be done by active groups, support-seeking groups, organizations and academic community on the basis of local/national programs. A good indicator needs to be completely transparent, describable and easy to acquire and interpret and should be able to assess and monitor programs designed on changes in risky behavior. It should also be traceable over time and capable of being developed with minimum cost [1 - 3]. Although numerous disease control programs employ bioindicators for evaluation and monitoring purposes, biological information might be inaccessible for AIDS and reproductive behaviors. Presently, AIDS and reproductive health programs revolve more around prevention. Also, AIDS related programs, particularly those targeting the youths are more directed toward preventive measures. In the absence of AIDS prevalence rate data, behavior change models have been at the front burner of planning in numerous countries. Although the number of sexually transmitted AIDS cases in Iran is on the increase; however, evidence regarding the cognitive, psychological and behavioral aspects of AIDS is insufficient and inadequate. This is because behavior change programs lack adequate data, making their effect immeasurable in most cases [4, 5]. The most typical framework for the selection of indicators is the "input-output" and short-term outcomes. The incident of AIDS is an outcome indicator, which is usually measured in countries with HIV surveillance systems [6]. Despite the relatively low HIV prevalence rate (less than 5%) among the Iranian general population, the number of sexually transmitted HIV cases is on the increase, with 4.5% of female sex workers suffering from HIV [7]. Risky sexual behaviors among the Iranian youth population have been reported to be 19.5-41% [5, 8]. In 2014, 106,000 AIDS cases were reported, which is expected to increase significantly by 2020 [9]. In 2013, 57% of HIV cases in Iran were in the age bracket of 15-34 [10]. Consequently, it is necessary to develop and implement reproductive health and HIV indicators to achieve a more favorable blueprint for the prevention of AIDS among the Iranian youth population. Given the insufficient number of indicators developed to study AIDS prevention variables in Iran, the present study was conducted to develop and implement AIDS and reproductive health indicators for the Iranian youth population.

2. METHODOLOGY

AIDS and reproductive health indicators were developed employing indicators related to youth studies and various articles and websites including the World Health Organization (WHO), Joint United Nations Program on HIV/AIDS (UNAID), Family Health International (FHI), and the Center for Disease Control and Prevention (CDC). An indicator bank was prepared after ascertaining that the Iranian Ministry of Health and Medical Education had not already developed the specified indicators to study AIDS prevention programs. The indicators were then submitted to a focus group comprised of health professionals in the field of communicable disease control (including AIDS), family health experts and four reproductive health experts who were also university faculty members. After stating the objective of the study, the indicators were classified into a 5-point Likert scale (useful, sensitive, special, accessible, and comprehensible) based on the WHO criteria. Indicators were verified by the majority of votes. After prioritization, 28 out of 40 indicators were examined and developed for implementation. For the "knowledge and perceived threat of AIDS" indicator, the CDC questionnaire was employed [11]. A 5-point Likert scale, ranging from "I am sure it is true" to "I am sure it is not true", was used to score knowledge of AIDS, with 60 points being the maximum obtainable score. The scores were classified into high, medium and low levels of knowledge. Regarding the perceived threat of AIDS, five 5-point Likert scale items were considered with the maximum score being 25. The obtainable scores were grouped into three categories of "poor", "medium", and "good". Regarding attitude to sexual abstinence, the WHO questionnaire was employed [12].This questionnaire was previously administered to male adolescents in Tehran by Mohammadi *et al.* [13]. Eight 5-point Likert scale items were included in the study for this indicator with the maximum score being 40. The obtainable scores were grouped into "poor", "medium" and "good" categories. As regard sexual abstinence self-efficacy, eight 5-point Likert scale items were included in the study with the maximum score being 40. The obtainable scores were grouped into "poor", "medium", and "good" categories [14]. Regarding knowledge of and attitude toward condoms, the CDC scale was employed [12]. Knowledge items about condom were presented in the form of "yes", "no", and "no opinion" answers. The correct answer was given 1 point, whereas the incorrect and "no opinion" answers were given zero points. Five 5-point Likert scale items were used for attitudinal items relating to condom use, with 25 points being the maximum obtainable score. The obtainable scores were classified into "poor", "medium", and "good" groups. Five 5-point Likert scale items were considered for condom self-efficacy [14], with the maximum score being 25. Indirect items for the measurement of reproductive health behaviors were derived from the CDC questionnaire [11].

The reliability of the questionnaire was verified employing the test-retest technique. The Pearson's correlation coefficients for knowledge of HIV, perceived threat of AIDS, attitude to sexual abstinence, attitude to condom, abstinence self-efficacy and condom self-efficacy were r=0.72, r=0.94, r=0.6, r=0.72, r=0.65, and r=0.67, respectively. Internal validity was assessed using Cronbach's alpha with the following coefficients for knowledge of condom, knowledge of AIDS, perceived threat of AIDS, attitude to sexual abstinence, abstinence self-efficacy, condom self-efficacy, and attitude to condom, respectively: α=0.60, α=0.60, α=0.62, α=0.87, α=0.81, α=0.80, and α=0.61. The results had been previously published in another article [15].

Adam Chuck *et al.*, questionnaire was employed to evaluate items relating to adolescent's comfort when talking to parents, reproductive healthcare providers and friends [16]. Before administration, the items were pre-tested on 10 female and 10 male students to ensure that the words were fully understood.

In the next stage, *i.e.* implementation of indicators, 1500 female and male students in the age bracket of 18-24 were included in the study. Multistage sampling was employed. Each university and class was initially considered a single stratum and cluster, respectively. The number of clusters per university was assigned based on the number of students in each university in proportion to the total number of students in the university of Shahroud. After obtaining permission from the universities and stating the objective of the study, the questionnaires were distributed to students during the end of lecture time upon the agreement of the education officials and were then collected after 45 minutes. To ensure that the information provided were confidential, students were asked not to write down their names and fields of study. Data were analyzed using SPSS software, version 20 and descriptive-analytical statistics such as percentage, mean scores, t-test analysis and chi-squared test.

3. RESULTS

The mean age of female and male students was 20.16±1.49 and 20.32±1.575, respectively. Other characteristics are presented in Table **1**. Results regarding knowledge of AIDS showed that 15 (1.7%) of female and 26 (5.1%) of male students answered correctly to questions on whether "AIDS can be transmitted through semen" or not; the difference was statistically significant (P = 0.000). Responding to whether "AIDS can be transmitted through the use of a previously used toilet by an individual suffering from AIDS", 168 (18.8%) of female and 166 (32.0%) of male students answered correctly; the difference was statistically significant (P = 0.000). Responding to whether "people suffering from AIDS are typically thin and feeble", 49 (5.5%) of female and 47 (9.1%) of male students answered correctly; the difference was statistically significant (P = 0.021). Responding to whether "mosquito bites may transmit AIDS" or not, 199 (22.1%) of female and 114 (21.7%) of male students answered correctly; the difference was statistically significant (P = 0.000). A total of 807 (88.3%) female and 428 (80.8%) male students were aware of tubal ligation techniques. A total of 870 (95.4%) female and 510 (95.5%) male students were knowledgeable about the fact that condoms cannot be used more than once. A total of 414 (45.6%) female and 174 (33.1%) male students were familiar with genital herpes as a kind of Sexually Transmitted Infection (STI). A number of the questionnaires' items were referred to in this article.

Table 1. Demographic characteristics students of Shahroud universities, divided by gender.

Demographic Variables		Male Students	Female Students	P value*
–		N(%)	N(%)	–
Gender		535(36.1)	919(62.1)	0.001
Marital Status	married	29(5.5)	138(15.2)	0.001
Paternal Education	Junior High School	94(17.7)	167(18.3)	0.084
	High School	151(28,4)	290(31.8)	
	Diploma	114(21.4)	128(14)	
	Higher	94(17.7)	167(18.3)	
Maternal Education	Junior High School	99(18.6)	176(19.3)	0.380
	High School	173(32.6)	306(33.6)	
	Diploma	53(10)	78(8.6)	
	Higher	99(18.6)	176(19.3)	
Paternal Occupation	Employed	481(92.5)	835(93.7)	0.884
Maternal Occupation	Housewife	443(83.4)	760(83.1)	
Residential Status	With Spouse	9(1.8)	60(6.7)	0.001
	With Family	330(64.6)	336(373)	

*χ^2

Regarding attitude to condoms and response to whether "those who use condoms during sexual intercourse trust their partner or not", 271 (30.2%) of female and 117 (22.4%) of male students completely disagreed; the difference was statistically significant (P = 0.000). Responding to "if two adolescents know each other very well, it is ok to engage in sexual intercourse without using condoms", 312 (34.4%) of female and 123 (23.4%) of male students completely disagreed; the difference was statistically significant (P = 0.000). Regarding condom self-efficacy and response to "I can get condoms if I want to", 267 (29.9%) of female and 317 (60.5%) of male students completely disagreed; the difference was statistically significant (P = 0.000). Responding to "I can use condoms correctly", 172 (19.5%) of female and 272 (52.1%) of male students completely disagreed; the difference was statistically significant (P = 0.000). Regarding attitude toward sexual abstinence and response to "single males/females should not engage in sexual intercourse", 502 (55.2%) of female and 148 (28.0%) of male students completely disagreed; the difference was statistically significant (P = 0.000). Responding to "single males/females should not be friends with one another", 132 (14.5%) of female and 65 (12.3%) of male students completely disagreed; the difference was statistically significant (P = 0.000). Regarding abstinence self-efficacy and response to "even if my boy/girlfriend wants to engage in sexual intercourse, I can convince him/her to wait", 417 (46.6%) of female and 101 (19.6%) of male students completely disagreed; the difference was statistically significant (P = 0.000). Responding to "even if I have sexual feelings toward my boy/girlfriend, I can abstain from engaging in sexual intercourse", 417 (46.4%) of female and 106 (20.3%) of male students completely disagreed; the difference was statistically significant (P = 0.000). Responding to "I have control over my body and can abstain from engaging in sexual intercourse", 411 (45.5%) of female and 113 (21.7%) of male students completely disagreed; the difference was statistically significant (P = 0.000). Other characteristics are presented in Table **2**.

Table 2. Reproductive health indicators, students of Shahroud universities, divided by gender.

Divided by Gender			
Indicators	**Questionnaire Scores/ Measurement Method of Knowledge, Attitudinal, and Behavioral Indicators**	**Male N(%)**	**Female N(%)**
Number/percentage of students with good knowledge levels of AIDS to all students	(48-70)	21(3.9)	31(3.4)
Number / percentage of students with good knowledge levels of condoms to all students	Responding to 5 items (birth control, AIDS, STD, and disposability	379(71.4)	443(49)
Number/percentage of Students unable to name at least one modern birth control method (except for condom and pills) to all students	Spermicide, tubal ligation, vasectomy, contraceptive injection, IUD	46(9.9)	50(5.9)
Number /percentage of students who had heard of at least one STD	–	134(26.2)	175(19.6)
Number /percentage of students who felt greatly threatened by the number of youth exposed to AIDS to all students	(18-25)	38(7.1)	59(6.4)
Number/percentage of students with good attitude to condoms to all students	(18-25)	87(16.3)	314(34.)
Number/ percentage of students with good attitude to sexual abstinence to all students	(28-40)	155(29)	140(13.1)
Number/ percentage of students with good self-efficacy to condoms to all students	(28-40)	6(1.1)	83(9.1)
Number /percentage of students who didn't know any of STD symptoms in men	Pain, wound, secretion, itching	175(32.7)	378(41.1)
Number of students who didn't know any of STD symptoms in women to all students	Pain, wound, secretion, itching, bleeding	230(43)	295(32.1)
Number/percentage of male students who had experienced at least one STD symptom	–	106(22.2)	228(27)
Number/percentage of students who attempted to treat STDs	–	7(1.3)	10(1.2)
Number/percentage of female students who believed that the perfect age for females to get married was under 23	–	–	348(39.2)
Number/percentage of students who felt comfortable talking to their mothers about AIDS to all students	–	302(59.3)	297(33.4)
Students/ percentage who felt comfortable talking to their mothers about sexual relations and their consequences to all students	–	356(70.1)	468(52.2)
Students/ percentage who felt comfortable talking to their fathers about AIDS to all students	–	350(68.9)	810(90.6)
Students/percentage who felt comfortable talking to their fathers about sexual relations and their consequences to all students	–	305(60.5)	695(77.9)

(Table 2) contd.....

Divided by Gender			
Indicators	**Questionnaire Scores/ Measurement Method of Knowledge, Attitudinal, and Behavioral Indicators**	**Male N(%)**	**Female N(%)**
Number/percentage of students who felt comfortable talking to healthcare providers about birth control methods to all students	–	191(37.6)	542(60.9)
Number /percentage of students who felt comfortable talking to healthcare providers about AIDS to all students	–	213(41.7)	485(53.8)
Number /Percentage of students who believed the majority of their single friends have never had sexual relations to all students	–	157(30.4)	267(29.5)
Number /Percentage of students who believed the majority of their single friends use condoms or other birth control methods during sexual intercourse to all students	–	154(30.4)	189(22.4)
Number /Percentage of students that think the majority of their friends have had more than one boy/girlfriend in the past 6 months	–	133(25.7)	111(12.4)
Number / percentage Level of comfort when referring to a physician to talk about sexual matters	–	424(29.4)	137(25.7)
Treatment of STDs	–	7(1.3)	10(1.2)
Number / percentage of students referring to birth control clinics or centers to get birth control devices	–	31(2.3)	
Number / percentage of male students who believed that the perfect age for males to get married was under 26	–	293(40.6)	–
Number / percentage of students who underwent voluntary HIV testing to all students	–	17(1.2)	
Number / percentage of students who had received the HIV test results to all students	–	7(41.4)	

4. DISCUSSION

Adolescents' reproductive health indicators are a set of knowledge, attitudes and behaviors that can directly or indirectly affect their reproductive health. According to the present study, only about 20% of students demonstrated favorable knowledge levels of AIDS, whereas in a study conducted by Shokouhi *et al.*, this figure was 37%. Considering the different times at which the two studies were conducted, it appears that there has been improvement in the knowledge of adolescents in this regard. Moreover, the age limit in the study by Shokouhi *et al.*, was 29, which differs from that of the present study, *i.e.* 18-24. Nevertheless, 70-80% of the Iranian youth population lack adequate knowledge about AIDS [17]. In a study conducted by Maimaiti *et al.*, on Chinese students, 27.3% of the participants had attended lectures on AIDS educational programs. A total of 74.5% of the students had acceptable knowledge levels of AIDS, and 80% believed that AIDS can be transmitted through needle sharing and from mother to fetus. A total of 65-75% of students believed that condom prevents HIV transmission. However, inaccurate perceptions were also copious. A total of 43.2% did not know that blood test results could be negative during the first two months of developing HIV [18]. In a study in Iran, 43.4% of the youth population believed that people with HIV enjoy perfectly healthy appearances, and 23.4% and 44.9% of the population knew that AIDS can be transmitted orally and rectally, respectively [19]. Considering the insufficient knowledge of the youth on HIV/AIDS, it is recommended that courses such as "family planning" be incorporated into the general curriculum of students. In the present study, female students were believed to be at higher risk of AIDS than their male counterparts. In a study conducted on 1008 adolescents within the age bracket of 14-19, 483 had sexual relations, more than half of whom (57.6%) did not believe they were at risk of AIDS and 17.2% believed they were slightly at risk of AIDS. In addition, their knowledge of AIDS was limited [20]. The degree of perceived threat is a significant predictor of condom use in adolescents [21]. In a study conducted in Iran, it was reported that 82% of women with HIV had never used condoms [22]. The reduction in threat has been a major obstacle to condom use among Iranian youths [23]; therefore, this is an important indicator in the evaluation of reproductive health and AIDS programs. As regard the condom indicators, results showed that students' knowledge particularly that of male students was acceptable, such that two-thirds of male and half of female students had good information about condoms. However, their attitude and self-efficacy toward using them during sexual intercourse were very poor. Condoms are key elements of prevention strategies that people can use to reduce the risk of developing AIDS. Knowledge of condoms alone is not sufficient, skill and a feeling of self-efficacy are other important factors in the use of condom [24]. According to a study conducted in Iran, 16% of females and 29% of males used condoms during sexual intercourse. The low percentage of condom use is an indicator of the need to draw attention to the attitude and self-efficacy of Iranian youths in using condoms [25]. Apart from condoms and birth control pills for which students' knowledge was excellent, their knowledge of other birth control techniques, including tubal ligation and

vasectomy, IUDs and hormonal methods such as contraceptive injections was acceptable. This could be due to the fact that they had taken courses on family planning at the university and so were completely familiar with these techniques. A study conducted on 215 students revealed that 81% had good knowledge of modern birth control methods [26]. It appears that students have become more knowledgeable about specific aspects of reproductive health. Knowledge of STDs is not ideal yet; therefore, reproductive health programs need to place more emphasis on this issue. In the present study, more than one-third of all students had no knowledge of any STD symptoms in women and men. In another study, it was reported that 51.6% of the youth population had heard of hepatitis, 47.7% of gonorrhea, 4.7% of genital warts and 3.9% of genital herpes. In a study by conducted by Simber *et al.*, it was reported that 46% of the youth population had heard about gonorrhea and 40% of syphilis as STDs [27]. Coatano *et al.*, conducted a study that was aimed at identifying university students' sexual behavior and knowledge of STDs in Sao Paulo, Brazil. Results regarding knowledge of STDs showed that 90% of students had heard about AIDS, syphilis, herpes, and gonorrhea and 69-76% were aware that genital warts could be transmitted sexually. Moreover, 30-34% and 16-23% were informed about trichomoniasis and chlamydia, respectively [28].

Regarding attitude to marriage age, the majority of female students, *i.e.* 153 (17.2%), believed that the perfect age for females to get married was 23-24. A total of 218 (15.5%) of male students also believed that the perfect age for females to get married was 24. The marriage age among Iranian youths has risen compared to the past two decades due to the desire of youths to study up to the university level as well as sociocultural changes such as urbanization, global revolution in family structures and economic concerns. In 2011, the most frequent and prevalent combined marriage age in Iran ranged from 25-29 years in men and 20-25 years in women. The mean marriage age in men and women was 27 and 23.4 years, respectively [10].

As regard indicators that indirectly evaluated the sexual behaviors and attitudes of youths, results showed that about two-thirds of female and male students believed that the majority of their friends had had sexual relations. Two-thirds of male and 80% of female students believed that the majority of their friends did not use condoms during sexual intercourse. One-fourth of male and 85% of female students believed that the majority of their friends had had more than one boy/girlfriend in the past 6 months. Attitude toward sexual relations including individuals' attitude and important people in the community such as friends and parents contributes significantly to the sexual behavior of individuals. A study showed that attitude to sexual relations; in particular, perceived attitude to sexual abstinence could be the strongest predictor of sexual behavior. Consequently, parents, healthcare providers and planners need to strive toward inculcating such attitudes in individuals in order to reduce high-risk sexual behaviors [29]. In a study conducted in Iran, 24% of girls believed that a large number of their friends had boyfriends [30]. Small-scale studies in Iran have confirmed premarital sex and a strong propensity on the part of the youth population as the reason for the establishment of premarital friendships among youths [31]. More than 85% of girls and 50% of boys expressed poor self-efficacy in relation to sexual abstinence. According to a study conducted in South Delhi on 255 adolescent girls within the age bracket of 14-19, 28% of the participants believed that girls cannot keep their virginity before marriage. A total of 9% were sexually active, and 31% did not consider condom as the most efficacious technique for the prevention of AIDS and STDs. Quoting from Whitt, Mac Manus believed that attitudes, norms and motivational factors were among the essential components for achieving an understanding of why adolescents engage in high-risk sexual behaviors [32]. Reasons for premarital sex in Iran were reported to include sexual needs (40% in girls and 72.6% in boys), having a right sex partner (2.1% in girls and 24.5% in boys), and emotional needs (28.7% in girls and 4.3% in boys) [30]. Mousavi *et al.*, studied premarital friendships from the perspective of human ecology. Results showed that in the human microsystem, individual desire, free family environment on premarital sexual behavior of adolescents and emotional needs were reasons for premarital friendships. In the human mesosystem, placement of value on premarital relations in academic environments could account for such relations. In the human exosystem, the promotion of premarital friendship culture in the media could be responsible for such relations. In addition, in the human macro-system, the influence of Western culture could also be responsible for such relations. Nevertheless, religion can play an effective role in reducing high-risk sexual behaviors [33].

In the present study, 1.2% of students underwent HIV testing and only 41.4% of them received the results. A large-scale study in Nepal showed that 20% of boys and 7% of girls who had premarital sex underwent HIV testing and received the results [34], demonstrating a significant difference between the two countries in this regard. Consequently, planning and culture-building practices seem imperative.

The results of the present study suggested that students were not comfortable to talk to a physician about sexual matters; nor were they comfortable talking about reproductive health issues with healthcare providers. This was

particularly evident for male students, which may be due to the fact that the majority of adolescent reproductive health services were offered by women. A lack of gender balance in offering services may result in adolescent males hesitating to get information from health centers [35, 36].Studies in Iran indicated that adolescent males were typically less knowledgeable about reproductive health issues than females, and that the majority of adolescents were not offered prevention consultations and surveillance services particularly for risky sexual behaviors [31, 36].

The present study showed that more than two-thirds of the adolescents felt comfortable with their parents talking about health reproductive issues. In a study by Bazarganipour *et al.*, two-thirds of the adolescents felt comfortable talking to their mothers about sexual matters [37]. According to a study conducted in South Delhi on 255 adolescent girls within the age bracket of 14-19, 48% were not comfortable talking to their parents about sexual issues and STDs [32]. However, studies showed that lack of skill and embarrassment [31] on the part of parents, and societal norms acted as socio-cultural impediments to youths in talking about sexual issues in the Iranian society [38].

CONCLUSION

In this study, 28 indicators were developed. Planning can be done to reduce factors that adversely affect the enhancement of adolescents' reproductive and sexual health through the measurement of such indicators, including educational and service programs that provide a better access to such services for adolescents.

ETHICAL APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

HUMAN/ANIMAL RIGHTS

No humans/animals were used for the studies that are bases of this research.

CONSENT FOR PUBLICATION

Informed written consent was obtained from all the participants.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

This article was obtained from a Ph. D. thesis approved by Shahroud University of Medical Sciences under the ethics code 890/08. The authors would like to express their gratitude to those who supported them in conducting this study.

REFERENCES

[1] McCoy K, Ngari P, Krumpe E. Ten criteria for assessing indicators Adapted from: Building monitoring. evaluation and reporting systems for HIV/AIDS Programs PACT 2005; pp. 41-2.

[2] Selecting Reproductive Health Indicators: A guide for district managers Field-testing version (1997): 27-30

[3] WHO. Global Reference List of 100 Core Health Indicators 2015: 1-45

[4] USAID. Handbook of Indicators for HIV/AIDS/STI Programs. 2 ed.. Washington, DC 20005: 2005. USAID

[5] National AIDS committee secretariat, ministry of health and medical education islamic republic of Iran AIDS Progress Report On Monitoring of the united nations general assembly special session on HIV and AIDS March 2015.

[6] Selik R, Mokotoff E, Branson B, Owen S, Whitmore S, Hall H. Revised surveillance case definition for HIV infection-United States MMWR Recomm Rep 2014; 63(3): 1-10.

[7] Janghorban R, Latifnejad R. R, Taghipour A, Abbasi M. Iran current status of sexual health and rights indicators in iran: An overview. Iran Red Crescent Med J 2015; 17(6): e23731.
[http://dx.doi.org/10.5812/ircmj.23731] [PMID: 26328067]

[8] Vakilian K, Mousavi SA, Keramat A. Estimation of sexual behavior in the 18-to-24-years-old Iranian youth based on a crosswise model study. BMC Res Notes 2014; 7: 28.
[http://dx.doi.org/10.1186/1756-0500-7-28] [PMID: 24410965]

[9] Haghdoost A, Mostafavi E, Mirzazadeh A, Navadeh S, Feizzadeh A, Fahimfar N. Modelling of HIV/AIDS in Iran up to 2014. J AIDS HIV Res 2011; 3(12): 231-9.

[http://dx.doi.org/10.5897/JAHR11.030]

[10] Abbasi-Shavazi M, Sadeghi R. Demographic and socio-economic status of youth in IR Iran. United Nations Population Fund, University of Tehran and Statistical Research and Training Center, 2013, Dec.

[11] Pophan JW, Hall EA, Tonk DS, *et al.* Assesment instrument for measuring student outcomes (Grade 7-12). CDC 1999.

[12] Asking young people about sexual and reproductive behaviours:Illustrative Core Instruments: Hearing before the UNDP, UNFPF, WHO,WORLD BANK 2001.

[13] Mohammadi MR, Mohammad K, Farahani FKA, *et al.* Reproductive knowledge, attitudes and behavior among adolescent males in Tehran, Iran. Int Fam Plan Perspect 2006; 32(1): 35-44.
[http://dx.doi.org/10.1363/3203506] [PMID: 16723300]

[14] Linda MK, Green M, Rosemary R, *et al.* Sexual Stigma, sexual behaviors, and abstinence among vietnamese adolescents: Implications for risk and protective behaviors for hiv, stis, and unwanted pregnancy. J Assoc Nurses AIDS Care 2007; 18(2): 48-59.
[http://dx.doi.org/10.1016/j.jana.2007.01.003] [PMID: 17403496]

[15] Mousavi A, Keramat A, Vakilian K, Esmaeili Vardanjani SA. Development and adaptation of Iranian youth reproductive health questionnaire. ISRN Obstet Gynecol 2013; 2013(31): 950278.
[PMID: 23984084]

[16] Adamchak SE, Bond K, MacLaren Ll. FOCUS on Young Adults tool series 5, series 5 FOCUS on Young Adults tool 2000.

[17] Shokoohi M, Karamouzian M, Mirzazadeh A, *et al.* HIV knowledge, attitudes, and practices of young people in Iran: Findings of a national population-based survey in 2013. PLoS One 2016; 11(9): e0161849.
[http://dx.doi.org/10.1371/journal.pone.0161849] [PMID: 27626638]

[18] Maimaiti N, Shamsuddin K, Abdurahim A, Tohti N. Knowledge, attitude and practice regarding hiv/aids among university students in xinjiang. Glob J Health Sci 2010; 2(2): 51.
[http://dx.doi.org/10.5539/gjhs.v2n2p51]

[19] Kolahi AA, Rastegarpour A, Abadi AR, Nabavi M, Sayyarifard A, Sohrabi MR. The knowledge and attitudes of a female at-risk population towards the prevention of AIDS and sexually transmitted infections in Tehran. J Res Med Sci 2011; 16(11): 1452-8.
[PMID: 22973347]

[20] Sychareun V, Thomsen S, Chaleunvong K, Faxelid E. Risk perceptions of STIs/HIV and sexual risk behaviours among sexually experienced adolescents in the northern part of Lao PDR. BMC Public Health 2013; 13: 1126.
[http://dx.doi.org/10.1186/1471-2458-13-1126] [PMID: 24304698]

[21] Zhang H, Liao M, Nie X, *et al.* Predictors of consistent condom use based on the Information-Motivation-Behavioral Skills (IMB) model among female sex workers in Jinan, China. BMC Public Health 2011; 11(1): 113.
[http://dx.doi.org/10.1186/1471-2458-11-113] [PMID: 21329512]

[22] Haghgoo SM, Joula H, Mohammadzadeh R, *et al.* Epidemiology of HIV/AIDS in the East Azerbaijan Province, Northwest of Iran. Jundishapur J Microbiol 2015; 8(8): e19766.
[http://dx.doi.org/10.5812/jjm.19766v2] [PMID: 26468361]

[23] Lotfi R, Ramezani TF, Yaghmaei F, Hajizadeh E. Barriers to condom use among women at risk of HIV/AIDS: A qualitative study from Iran. BMC Womens Health 2012; 12(1): 13.
[http://dx.doi.org/10.1186/1472-6874-12-13] [PMID: 22624530]

[24] Shaweno D, Tekletsadik E. Validation of the condom use self-efficacy scale in Ethiopia. BMC Int Health Hum Rights 2013; 13: 22.
[http://dx.doi.org/10.1186/1472-698X-13-22] [PMID: 23617404]

[25] Vakilian K, Abbas Mousavi S, Keramat A, Chaman R. Knowledge, attitude, self-efficacy and estimation of frequency of condom use among Iranian students based on a crosswise model. Int J Adolesc Med Health 2016; 30(1): 20160010.
[PMID: 27176740]

[26] Skrzeczkowska A, Jerzy Heimrath J, Justyna Surdyka J, Zalewski J. Knowledge of contraceptive methods among adolescents/young adults. Zdrow Publiczne 2015; 125(3): 144-8.

[27] Simbar M, Tehrani FR, Hashemi Z. Reproductive health knowledge, attitudes and practices of Iranian college students. East Mediterr Health J 2005; 11(5-6): 888-97.
[PMID: 16761658]

[28] Caetano ME, Linhares IM, Pinotti JA, Maggio da Fonseca A, Wojitani MD, Giraldo PC. Sexual behavior and knowledge of sexually transmitted infections among university students in Sao Paulo, Brazil. Int J Gynaecol Obstet 2010; 110(1): 43-6.
[http://dx.doi.org/10.1016/j.ijgo.2010.02.012] [PMID: 20394925]

[29] Akers AY, Gold MA, Adimora E BJ, P OD AA, Fortenberry JD. Variation in bexual behaviors in a cohort of adolescent females: The role of personal, perceived peer, and perceived family attitudes. J Adolesc Health 2011; 48(1): 1-8.
[http://dx.doi.org/10.1016/j.jadohealth.2010.05.004] [PMID: 21185515]

[30] Shamshiri Milani H, Azarghashb E. Knowledge and attitudes of female students who live in Tehran dormitories, towards STDs and sexual relationship. Iran J Clin Infect Dis 2011; 6(1): 35-40.

[31] Keramat A, Vakilian K, Mousav S. Barriers to youths' use of reproductive health services in Iran. Life Sci J 2013; 10: 943-9.

[32] McManus A, Dhar L. Study of knowledge, perception and attitude of adolescent girls towards STIs/HIV, safer sex and sex education: (a cross sectional survey of urban adolescent school girls in South Delhi, India). BMC Womens Health 2008; 8: 12.
[http://dx.doi.org/10.1186/1472-6874-8-12] [PMID: 18647417]

[33] Mousavi SA, Keramat A, Vakilian K, Chaman R. Interpretation of opposite-sex friendship based on social ecology model in Iranian females. Iran J Psychiatry Behav Sci 2012; 6(2): 69-78.
[PMID: 24644485]

[34] Kathmandu N. Sexual and reproductive health of adolescents and youth in Nepal: Trends and Determinants, 2013.

[35] Hajizadeh M, Javadnoori M, Javadifar N. Educational needs of adult men regarding sexual and reproductive health in Ahvaz. JMRH 2015; 3(3): 385-93.

[36] 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.
[PMID: 23926532]

[37] Bazarganipour F, Foroozanfard F, Taghavi SA, Hekmatzadeh F, Sarviye M, Hosseini N. Evaluation of female youth educational needs about reproductive health in non-medical students in the city of Qom. J Family Reprod Health 2013; 7(2): 67-72.
[PMID: 24971106]

[38] Shariati M, Babazadeh R, Mousavi SA, Najmabadi KM. Iranian adolescent girls' barriers in accessing sexual and reproductive health information and services: A qualitative study. J Fam Plann Reprod Health Care 2014; 40(4): 270-5.
[http://dx.doi.org/10.1136/jfprhc-2013-100856] [PMID: 25183530]