



Design and Psychometric Evaluation of a Sexual Health Knowledge Scale for University Students

ARTICLE INFO

Article Type

Descriptive Study

Authors

Soleymani Sh.¹ MSc
Moghaddam-Banaem L.*¹ PhD
Tavousi M.² PhD
Kamali M.³ PhD

How to cite this article

Soleymani Sh, Moghaddam-Banaem L, Tavousi M, Kamali M. Design and Psychometric Evaluation of a Sexual Health Knowledge Scale for University Students. Health Education and Health Promotion. 2025;13(1):171-177.

ABSTRACT

Aims This study aimed to design and evaluate the validity and reliability of a questionnaire regarding sexually transmitted infections and HIV/AIDS knowledge among undergraduate university students in Iran.

Instrument & Methods This research was conducted in 2018 among university students in Tehran, Iran. The questionnaire was designed to measure knowledge of sexually transmitted infections and HIV/AIDS by reviewing the relevant literature and consulting expert panels for item production in the initial step. The next step was to assess the instrument's face and content validity. The internal consistency (Cronbach's α) and interclass correlation coefficient were used to evaluate the reliability of the questionnaire.

Findings The face validity of the developed scale was considered appropriate, with an impact score greater than 1.5. The content validity, measured through the content validity index and content validity ratio for knowledge items related to sexually transmitted infections and HIV/AIDS, varied from 0.80 to 1. The Cronbach's α was 0.88 for sexually transmitted infection knowledge items and 0.86 for HIV/AIDS knowledge items. The interclass correlation coefficient values for the sexually transmitted infection and HIV/AIDS knowledge items were 0.86 and 0.85, respectively, indicating satisfactory reliability outcomes.

Conclusion The questionnaire on sexually transmitted infections and HIV/AIDS knowledge for Iranian young adults demonstrates satisfactory validity and reliability.

Keywords Surveys and Questionnaires; Acquired Immunodeficiency Syndrome; Sexually Transmitted Infections (STIs); HIV; Young Adults

CITATION LINKS

[1] Adolescent sexual and reproductive health ... [2] Defining sexual health: Report of a technical consultation on ... [3] Sexual health literacy and gay, bisexual and ... [4] Maternal and perinatal outcomes among nulliparous adolescents ... [5] Defining sexual health ... [6] A qualitative assessment of the sexual-health education, training and service needs of young ... [7] Sexual knowledge and attitudes among premarital couples ... [8] Sexual and reproductive health literacy of the youth ... [9] Knowledge of and attitudes towards sexual and reproductive health ... [10] Prevalence of unwanted pregnancy in Iran: A systematic review ... [11] Sexual and reproductive behaviors among undergraduate ... [12] Narratives of sexual health risk and protection amongst young people from refugee ... [13] Global health sector strategy on sexually transmitted infections 2016-2021 ... [14] Association between sexual and reproductive health knowledge ... [15] Effectiveness of structured teaching programme on knowledge regarding ... [16] Sexual knowledge and attitudes and sexual ... [17] Impact of health education on sexual safety among Hungarian ... [18] Development and validation of adolescent sexual and reproductive health-knowledge, attitude, and ... [19] Development of a questionnaire on knowledge, habits, and attitudes on sexually ... [20] Strategies to reduce stigma and discrimination in sexual and reproductive ... [21] Exploration of reproductive healthcare needs among adult men regarding ... [22] O-068 educating young people ... [23] Barriers of Asian youth to access sexual reproductive ... [24] Validation of the AIDS prevention questionnaire: A brief self-report ... [25] Design and psychometric properties of a questionnaire for ... [26] Quality and measurement properties of sexual health ... [27] Designing and constructing instruments ... [28] A quantitative approach to ... [29] Nursing research: Design ... [30] Exploring educational structure needed for reproductive health in men related to ... [31] Development and adaptation of Iranian youth ... [32] Exploring the barriers to sexual and reproductive health ... [33] Psychometric properties of the Persian version of the sexual ... [34] The more you know: Sexual knowledge as ... [35] Knowledge, information needs and risk perception about HIV and sexually ... [36] Development and psychometric analysis of a 44-item HIV/AIDS knowledge scale ...

¹Department of Reproductive Health and Midwifery, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

²Health Metrics Research Center, Iranian Institute for Health Sciences Research, ACECR, Tehran, Iran

³Department of Rehabilitation Basic Sciences, School of Rehabilitation Sciences, Iran University of Medical Sciences, Tehran, Iran

*Correspondence

Address: Department of Reproductive Health and Midwifery, Faculty of Medical Sciences, Tarbiat Modares University, Al-e Ahmad Highway, Tehran, Iran. Postal Code: 14115-111

Phone: +98 (21) 82883857
moghaddamb@modares.ac.ir

Article History

Received: February 20, 2025

Accepted: March 28, 2025

ePublished: April 5, 2025

Introduction

Low- and middle-income countries must prioritize the sexual health of their youth as an essential aspect of public health policy [1]. Sexual health encompasses various issues, including sexually transmitted infections (STIs), human immunodeficiency virus (HIV), acquired immunodeficiency syndrome (AIDS), unintended pregnancies, contraceptive methods, and related topics [2]. Furthermore, sexual health refers to the information, attitudes, behaviors, and specific abilities connected with sexuality [3]. Young individuals face significant challenges associated with high-risk sexual practices, which can lead to the transmission of STIs, HIV/AIDS, and unintended pregnancies. Addressing these problems is crucial for enhancing sexual health and preventing adverse health outcomes [4]. Moreover, an individual's sexual health significantly influences their quality of life related to both physical and emotional well-being [5]. Young adults need access to accurate information to prevent sexual health complications and to make informed choices in high-risk situations [6].

Previous studies have indicated that a considerable number of young Iranians have insufficient knowledge of sexual and reproductive health [7, 8]. Evidence shows a limited understanding of STIs among youth, although attitudes toward sexual health education are generally positive [9]. Growing concerns have also been noted regarding STIs, risky sexual behaviors, and unintended pregnancies among Iranian youth [10, 11]. Research has revealed that insufficient sexual health knowledge is associated with unprotected sex among young people [12, 13], while adequate knowledge encourages safer sexual practices [14, 15]. Studies also emphasize a strong correlation between sexual health awareness and the practice of safe sex [16, 17]. The existing tools primarily assess sexual health knowledge, attitudes, and behaviors [18, 19]. Furthermore, addressing STI-related stigma is essential for improving youth sexual health [20].

According to previous research, young people play a crucial role in preventing STIs and HIV/AIDS infections [21]. Therefore, the sexual and reproductive health of young individuals represents a significant health concern in many countries [22, 23].

Although there is increasing research on various sexual health issues concerning Iranian youth, there remains a considerable gap in reliable and culturally sensitive measurement tools for STI and HIV/AIDS knowledge.

The difficulty in addressing sexual health issues in this context arises from the absence of instruments that adequately address specific sociocultural aspects relevant to the region. While knowledge is a crucial prerequisite for preventing health challenges in any society, most existing instruments tend to be deeply rooted in different cultural environments and require adaptation for use in Iran [24-26].

This issue underscores the importance of developing a measurement tool designed to assess knowledge regarding STIs and HIV/AIDS among Iranian young adults. Therefore, this research aimed to design and psychometrically assess an instrument for evaluating young people's knowledge of STIs and HIV/AIDS in Iran. The objective was to construct a reliable instrument that accurately reflected local sociocultural conditions.

Instrument and Methods

Study design and participants

This study was conducted in a university setting among 30 undergraduate students aged 18-24 years in Tehran, Iran, selected by the convenience sampling method in 2018. The current study presents the instrument development and psychometric evaluation in two steps. The item generation for the instrument focused on the initial stage, while the next step involved assessing the validity and reliability of the Iranian young adult HIV/AIDS and STIs-related knowledge questionnaire.

For evaluating test-retest reliability, a sample size was calculated using power analysis, which indicated that 30 subjects would be sufficient to achieve a power of 0.80 in detecting a test-retest correlation of 0.90 at a 5% significance level.

Phase 1: Development of the questionnaire

Item generation

The process of item generation involved reviewing the literature on instruments related to STIs and HIV/AIDS knowledge to develop the questionnaire items. Academic documents on sexual and reproductive health were assessed globally from 2008 to 2018. The research team evaluated Persian databases, including Magiran, SID, and Irandoc, alongside English databases such as Science Direct, Scopus, MEDLINE, and PubMed. The primary terms used in the search included sexual health, reproductive health, HIV/AIDS, STIs, and young adults.

Phase 2: Psychometric evaluation of the questionnaire

In this phase, qualitative and quantitative methods were employed to evaluate the face validity, content validity, and reliability of the questionnaire.

Face validity assessment

1. Qualitative face validity

The qualitative face validity test was conducted through face-to-face interviews with 15 university students to obtain their opinions on the questionnaire's simplicity, clarity, and appearance. The understanding and readability of the questionnaire were evaluated among participants.

2. Quantitative face validity

The impact score for each item was assessed through quantitative face validity. In this process, the importance of each item was evaluated by 15 participants on a scale from one to five, categorized

as follows: not important (one point), slightly important (two points), relatively important (three points), Important (four points), and absolutely important (five points). The impact score was calculated by dividing the frequency by the importance. The impact score of the items was calculated using the impact score=frequency(%)×importance formula. Frequency denotes the proportion of individuals who assigned a score of four or five to the items. Importance is based on the average scores of the respondents as determined by the expected Likert scale. Questionnaire items with an impact score above 1.5 were considered appropriate [27].

Content validity assessment

1. Qualitative content validity

The evaluation of the questionnaire's content validity involved both quantitative and qualitative stages. The quantitative part included determining the content validity index (CVI) and content validity ratio (CVR) [28-30]. Ten experts qualitatively assessed the content validity of the questionnaire. The expert panel reviewed the item allocation, scaling, phrasing, sentence structure, and any necessary changes related to the questionnaire. The expert panel completed the item exclusions, revisions, or additions to the instrument [30].

2. Quantitative content validity

The CVR was computed using a three-point scale (necessary, useful but not necessary, and not necessary) to determine the necessity of the questionnaire items as evaluated by a panel of experts for quantitative content validity. The expert panel included two specialists in health education and promotion, four experts in sexual and reproductive health, two experts in behavioral sciences, and two gynecologists. The CVR formula $[(ne-N/2)/(N/2)]$ was employed to compute the score. In this formula, N represents the total number of experts, while it indicates the number of experts who selected the necessary option. A CVR of items above 0.62 was considered essential based on the evaluations of ten experts, according to Lawshe's table [28]. The CVI for the questionnaire items was assessed using the Waltz & Bausell method, focusing on clarity, relevance, and simplicity [29]. A four-point Likert-type scale was used to assess each questionnaire item, with categories ranging from not relevant (one) to completely relevant (four). The CVI score was calculated by dividing the number of experts who rated items as three or four by the total number of experts who participated. The evaluation of the CVI score for items was conducted according to specific criteria: Items scoring above 0.79 were accepted, those scoring between 0.70 and 0.79 required revision, and items scoring below 0.70 were eliminated [29].

Reliability evaluation

The instrument's reliability was assessed using Cronbach's α coefficients to measure internal consistency. The stability of the questionnaire was evaluated through test-retest reliability, employing the intraclass correlation coefficient (ICC). Thirty participants filled out the questionnaire twice, with a two-week interval between their responses. ICC values of 0.8 or higher were regarded as acceptable after comparing scores from the two assessments [31]. A Cronbach's alpha value of 0.70 or greater was considered appropriate.

Structure of the final questionnaire

Scoring and interpretation

A total of 120 items were generated through a broad search strategy. The items were assessed using a three-point scale (true, false, and do not know), where higher scores indicated greater knowledge of STIs and HIV/AIDS-related sexual health issues. Reverse scoring was applied to negatively worded items. The instrument was then refined to include 40 items to assess its validity and reliability after eliminating repeated items during the second stage of the survey.

This study resulted in the generation of two separate questionnaires to evaluate knowledge of STIs and HIV/AIDS. The first part consists of 20 items designed to assess knowledge of HIV/AIDS, with three response options (true, false, and do not know). Possible scores for this section ranged from 0 to 20, and the data analysis was based on the sum of correct answers. The second part of the questionnaire includes 20 items focused on knowledge of STIs, also with three response choices (true, false, and do not know). The questionnaire score for this section ranged from 0 to 20, with the sum of the correct answers used in the data analyses.

The Cronbach's α coefficients and ICC for this study were computed using SPSS 22.0 software.

Findings

The test-retest stage involved 30 participants, with a mean age of 21.00 ± 1.98 years, ranging from 18-24 years (Table 1).

The analysis of previous research on sexual health involved the development of a set of 120 items concerning knowledge about STIs and HIV/AIDS. The research team focused on selected items from this collection that were specifically relevant to the sexual health of young adults.

Duplicate, overlapping, and similar items were assessed, resulting in the merging or deletion of some items. Consequently, the overall count decreased to 52 items. The instrument then underwent a psychometric assessment to determine its face validity, content validity, and reliability. Seven items were revised during the face validity evaluation, but none were removed.

Table 1. Frequency of Demographic characteristics (n=30)

Parameter	Values
Gender	
Male	15(50.0)
Female	15(50.0)
Educational level	
First year	8(26.7)
Second year	9(30.0)
Third year	7(23.3)
Fourth year	6(20.0)
Ethnicity	
Fars	23(76.7)
Non-Fars	7(23.3)
Mother's education	
Primary	4(13.3)
Secondary	6(20.0)
Tertiary	12(40.0)
University	8(26.7)
Father's education	
Primary	4(13.3)
Secondary	5(16.7)
Tertiary	9(30.0)
university	12(40.0)
Living arrangement	
Campus	5(16.7)
Out of campus (with friends)	2(6.7)
With family	23(76.7)

For quantitative content validity, items were removed if their CVR and CVI were less than 0.62 and 0.79, respectively.

Consequently, 12 items with a CVR below 0.62 were excluded, resulting in 40 items. Two distinct questionnaires were developed to evaluate knowledge of STIs and HIV/AIDS, with 20 items for STIs and 20 items for HIV/AIDS, each offering three response options.

The questionnaire's CVI and CVR scores for STI-related items ranged from 0.80 to 1 (Table 2).

Similarly, the estimated CVI and CVR scores for the HIV/AIDS items also varied from 0.80 to 1 (Table 3).

The ICC for the STIs and HIV/AIDS domains of the questionnaire exceeded 0.8, indicating an acceptable level of reliability. The Cronbach's alpha values for the STIs and HIV/AIDS items were greater than 0.70. The findings indicated satisfactory internal consistency and stability (Table 4).

Table 2. Content validity results, including content validity index (CVI), content validity ratio (CVR), and impact score of sexually transmitted infection (STI) knowledge

No.	Items	CVI	CVR	Impact score
1.	A man can have sexually transmitted infections (STI) without any symptoms.	0.94	1.00	3.9
2.	Using a condom can reduce a person's chance of getting an STI.	1.00	1.00	4.0
3.	A Female condom can help decrease a woman's chance of getting an STI.	0.89	0.80	3.4
4.	Gonorrhea is a sexually transmitted infection (STI).	1.00	1.00	4.0
5.	Gonorrhea can cause pelvic inflammatory diseases (PID) in women.	0.96	0.94	3.9
6.	A woman is unable to get pregnant while she has gonorrhea.	0.97	0.84	3.7
7.	Only the female partner of a couple needs to be treated for gonorrhea.	0.98	0.94	3.8
8.	Gonorrhea can cause a man to have discharge from his penis.	1.00	1.00	3.9
9.	There is a cure for gonorrhea.	0.94	0.92	3.5
10.	The human papillomavirus is a sexually transmitted infection (STI).	1.00	1.00	4.0
11.	The human papillomavirus causes genital warts.	0.98	0.89	3.6
12.	A woman who has genital warts is more likely to get cervical cancer.	1.00	1.00	4.0
13.	Genital herpes can cause pain during urination.	1.00	1.00	3.8
14.	A woman who has genital herpes always has a sore in her vagina.	0.80	0.80	3.5
15.	A pregnant woman with genital herpes can pass the infection to her unborn baby.	1.00	1.00	4.0
16.	There is a cure for genital herpes.	0.92	0.82	3.7
17.	Chlamydia is a sexually transmitted infection (STI).	1.00	1.00	4.0
18.	Chlamydia can cause burning during urination.	0.97	0.80	3.8
19.	A woman who has chlamydia may have discharge from her vagina.	1.00	0.96	3.9
20.	Untreated chlamydia can cause infertility in women.	0.98	1.00	4.0

Table 3. Content validity, including content validity index (CVI), content validity ratio (CVR), and the impact score of HIV/AIDS knowledge

No.	Items	CVI	CVR	Impact score
1.	HIV and AIDS are the same things.	1.00	1.00	4.0
2.	The HIV virus can be spread by mosquitoes.	1.00	1.00	4.0
3.	Coughing and sneezing do not spread HIV.	0.92	0.80	3.5
4.	A person can get HIV from toilet seats.	1.00	1.00	4.0
5.	A person can get HIV through blood transfusions.	0.94	0.89	3.6
6.	A person can get HIV from a swimming pool with a person who has HIV.	0.97	1.00	4.0
7.	A person can get HIV from a woman's vaginal secretions.	0.98	0.92	3.7
8.	A person can get HIV by sharing a meal with someone who has HIV.	1.00	1.00	3.9
9.	A pregnant woman with HIV can give the virus to her unborn baby.	0.95	0.84	3.3
10.	Intravenous drug users who share needles can get HIV from them.	0.80	0.82	3.4
11.	A person can get HIV if she or he has unprotected sex.	1.00	1.00	4.0
12.	A person's risk of getting HIV increases if they have sex with more than one partner.	0.97	0.92	3.5
13.	Using a condom can lower a person's chance of getting HIV.	1.00	1.00	4.0
14.	Douching after sex will keep a woman from getting HIV.	0.84	0.80	3.4
15.	A person cannot get the HIV virus by having oral sex with a person who has HIV.	1.00	1.00	3.8
16.	A female condom can help decrease a woman's risk of getting HIV.	0.90	0.89	3.6
17.	A person can get HIV through contact with body fluids like saliva, tears, sweat, or urine.	0.94	0.95	4.0
18.	A person with HIV may look healthy.	1.00	1.00	4.0
19.	There is a cure for AIDS.	0.92	0.85	3.5
20.	There is a vaccine that can stop adults from getting HIV.	1.00	1.00	3.8

Table 4. Reliability of the Sexually Transmitted Infections (STIs) and HIV/AIDS Knowledge Questionnaires (n=30)

Instrument	Number of items	Cronbach's α coefficient	Intraclass correlation coefficient (ICC)
STIs Knowledge	20	0.882	0.865
HIV/AIDS Knowledge	20	0.866	0.859
Total	40	0.877	0.936

Discussion

This study aimed to design and evaluate the validity and reliability of a questionnaire regarding sexually transmitted infections and HIV/AIDS knowledge among undergraduate university students in Iran. The designed sexual health instrument for young people regarding STIs and HIV/AIDS knowledge was both valid and reliable in the context of Iran. The instrument demonstrated appropriate face validity and content validity results. Furthermore, the reliability test revealed that the Cronbach's alpha coefficient and ICC for the instrument were within acceptable ranges.

Previous studies on reproductive and sexual health have revealed a deficiency in a precise instrument for Iranian youths [31]. In response to this need, Mousavi *et al.* have developed a context-based instrument to assess the reproductive and sexual health knowledge, attitudes, and behaviors of youths in Iran. The reliability test results for the STIs and HIV/AIDS Questionnaire have indicated a moderate level of reliability [31]. Here, the questionnaire was developed specifically to focus on young adults' sexual health concerning STIs and HIV/AIDS knowledge. Additionally, the reliability results related to the STIs and HIV/AIDS knowledge items demonstrated acceptable reliability.

A literature review revealed that some studies have focused on men's sexual and reproductive health. In Iran, although men constitute the majority of individuals living with HIV/AIDS, women are reported to face double the risk of contracting infections through sexual activity [30]. While men play a crucial role in the community, they often neglect their own reproductive and sexual health [32].

Men's sexual and reproductive health concerning STIs and HIV/AIDS prevention has not received sufficient attention [32]. Furthermore, the sexual and reproductive health of both genders in Iran is generally considered a low-priority issue. Therefore, we aimed to develop a questionnaire to assess knowledge of STIs and HIV/AIDS, explicitly targeting the sexual health of both young male and female adults.

Additionally, Khani *et al.* have developed a needs assessment instrument specifically focusing on the sexual and reproductive health of Iranian women. The STIs-related items have a low reliability coefficient. Consequently, developing a more reliable instrument for evaluating STIs and HIV/AIDS within the Iranian community is essential [33]. In contrast, we indicated acceptable reliability coefficients for the STIs and HIV/AIDS knowledge items in the questionnaire.

There is a relationship between knowledge of sexual health and individual health outcomes [34]. Therefore, it is crucial to design tools for evaluating the sexual and reproductive health of young people to increase levels of sexual health awareness and decrease the rate of STIs among youths [32]. Adequate knowledge of sexual health allows young individuals to make smarter choices regarding their health [35]. This concept aligns with the current study's objectives of evaluating young people's sexual health knowledge by developing a context-specific instrument for society.

A study aimed at creating and evaluating an HIV/AIDS knowledge assessment tool specifically designed for the Iranian cultural context, with participants being a broad spectrum of individuals from various age groups, genders, and socioeconomic backgrounds. The study has not considered a specifically defined target population [36]. Nonetheless, our findings indicated that the sexual health questionnaire regarding HIV/AIDS and STIs knowledge had a clear target group, along with desirable validity and reliability. Our results align with those of Vakili *et al.*, revealing that the instrument developed for measuring HIV/AIDS knowledge is both valid and reliable. The scale also has high reliability [36]. Their findings are consistent with the validity and reliability results of our questionnaire.

This study may encounter self-report bias since, for social reasons, participants may overestimate their knowledge. However, the use of anonymous questionnaires and a focus on the confidentiality of results reduces this bias. The study population of university students may limit the generalizability of the research findings to other young people from differing cultural backgrounds. Future research should select participants from various age groups and settings to improve the generalizability of the findings. Additionally, exploratory and confirmatory factor analyses of the questionnaire should be performed in future studies.

The instrument was designed based on the sociocultural context of Iran. Therefore, this questionnaire can be successfully used in the Iranian context and in similar countries to assess young adults' knowledge of STIs and HIV/AIDS. For future research, this instrument is suitable for evaluating STIs and HIV/AIDS knowledge among youths in Iran and other nations.

Conclusion

The developed questionnaire regarding STIs and HIV/AIDS knowledge has satisfactory validity and reliability.

Acknowledgments: This research was conducted as part of a PhD thesis project in Reproductive Health at the Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran. We are grateful to all the research participants for their valuable collaboration.

Ethical Permissions: The study received approval from the Ethics Committee of Tarbiat Modares University of Medical Sciences, Tehran, Iran (IR.MODARES.REC.1397.268). This research was part of the PhD project in reproductive health. All participants received information regarding the study's objectives and provided written informed consent. They were assured that their information would remain confidential and anonymous throughout the research.

Conflicts of Interests: The authors declared no conflicts of interest.

Authors' Contribution: Soleymani Sh (First Author), Main Researcher (50%); Moghaddam-Banaem L (Second Author), Methodologist/Statistical Analyst (20%); Tavousi M (Third Author), Assistant Researcher (20%); Kamali M (Forth Author) Assistant Researcher (10%)

Funding/Support: This research was supported by Tarbiat Modares University.

References

- 1- Morris JL, Rushwan H. Adolescent sexual and reproductive health: The global challenges. *Int J Gynaecol Obstet.* 2015;131:S40-2.
- 2- WHO. Defining sexual health: Report of a technical consultation on sexual health, 28-31 January 2002, Geneva. Geneva: World Health Organization; 2006.
- 3- Martin S, McDaid L. Sexual health literacy and gay, bisexual and other MSM: A scoping review of the literature. Vancouver: Gay Men's Health Summit; 2014.
- 4- Ganchimeg T, Mori R, Ota E, Koyanagi A, Gilmour S, Shibuya K, et al. Maternal and perinatal outcomes among nulliparous adolescents in low-and middle-income countries: A multi-country study. *BJOG.* 2013;120(13):1622-30.
- 5- WHO. Defining sexual health [Internet]. Geneva: World Health Organization; 2006 [cited 2001, January 28-31?]. Available from: <https://www.who.int/teams/sexual-and-reproductive-health-and-research/key-areas-of-work/sexual-health/defining-sexual-health>.
- 6- Sheikhsari N, Abraham C, Denford S, Eftekhari M. A qualitative assessment of the sexual-health education, training and service needs of young adults in Tehran. *BMC Public Health.* 2021;21(1):1386.
- 7- Sadat Z, Ghofranipour F, Goshgarseidi A, Azin SA. Sexual knowledge and attitudes among premarital couples: A need for future educational programs. *Nurs Midwifery Stud.* 2016;5(4):e34469.
- 8- Dabiri F, Hajian S, Ebadi A, Zayeri F, Abedini S. Sexual and reproductive health literacy of the youth in Bandar Abbas. *AIMS Med Sci.* 2019;6(4):318-25.
- 9- Khajehei M, Ziyadlou S, Ghanizadeh A. Knowledge of and attitudes towards sexual and reproductive health in adults in Shiraz: A need for further education. *East Mediterr Health J.* 2013;19(12):982-9.
- 10- Moosazadeh M, Nekoei-Moghadam M, Emrani Z, Amiresmaili M. Prevalence of unwanted pregnancy in Iran: A systematic review and meta-analysis. *Int J Health Plann Manag.* 2014;29(3):277-90.
- 11- Hedayati-Moghaddam MR, Eftekharzadeh-Mashhadi I, Fathimoghaddam F, Pourafzali SJ. Sexual and reproductive behaviors among undergraduate university students in

Mashhad, a city in Northeast of Iran. *J Reprod Infertil.* 2015;16(1):43-8.

12- McMichael C, Gifford S. Narratives of sexual health risk and protection amongst young people from refugee backgrounds in Melbourne, Australia. *Cult Health Sex.* 2010;12(3):263-77.

13- WHO. Global health sector strategy on sexually transmitted infections 2016-2021: Toward ending STIs. Geneva: World Health Organization; 2016.

14- Okunola DA, Alawode OA, Ajayi AI. Association between sexual and reproductive health knowledge and protective sexual behaviors among young women in Nigeria. *MedRxiv.* 2022;2022.

15- Kumar A, Venkateshan M, Selvi. Effectiveness of structured teaching programme on knowledge regarding sexual health among young adults. *Int J Res Med Sci.* 2016;4(4):1119-23.

16- Alves R, Precioso J, Becoña E. Sexual knowledge and attitudes and sexual risk behaviours among college students. *EGITANIA SCIENTIA.* 2022;83-102.

17- Major D, Szabó K, Fazekas-Pongor V, Arva D, Falus M, Eörsi D, et al. Impact of health education on sexual safety among Hungarian adolescents. *Eur J Public Health.* 2023;33(Suppl 2):ckad160-776.

18- Setiyorini A, Sitaresmi MN, Nisman WA. Development and validation of adolescent sexual and reproductive health-knowledge, attitude, and self-efficacy questionnaires (ASRH-KASeQ). *Int J Adolesc Med Health.* 2024;36(4):351-8.

19- Salas-Marquez C, García RB, Jiménez JR, Escibano PC, Ruiz FR. Development of a questionnaire on knowledge, habits, and attitudes on sexually transmitted infections in teenagers and young adults. *ACTAS DERMOSIFILIOGRAFICAS.* 2024;115(4):387-92.

20- Bohren MA, Corona MV, Odiase OJ, Wilson AN, Sudhinaraset M, Diamond-Smith N, et al. Strategies to reduce stigma and discrimination in sexual and reproductive healthcare settings: A mixed-methods systematic review. *PLOS Glob Public Health.* 2022;2(6):e0000582.

21- Karimi L, Najmabadi KM, Ebadi A, Pormehr-Yabandeh A. Exploration of reproductive healthcare needs among adult men regarding sexual transmitted diseases and HIV/AIDS. *Electron Physician.* 2017;9(9):5250-6.

22- Biswakarma R, Reiss M, Harper J. O-068 educating young people about reproductive health. *Hum Reprod.* 2024;39(Suppl 1):deae108-070.

23- Najafi Sharjabad F, Haghighatjoo S. Barriers of Asian youth to access sexual reproductive health information and services: A literature review. *J Pediatr Perspect.* 2019;7(12):10541-51.

24- Gil-Llario MD, Ruiz-Palomino E, Morell-Mengual V, Giménez-García C, Ballester-Arnal R. Validation of the AIDS prevention questionnaire: A brief self-report instrument to assess risk of HIV infection and guide behavioral change. *AIDS Behav.* 2019;23(1):272-82.

25- Ghiasi A, Keramat A, Zayeri F, Farjamfar M, Vakilian K, Bagheri L. Design and psychometric properties of a questionnaire for assessing sexual and reproductive health needs of married adolescent women: an exploratory sequential mixed methods study. *J Obstet Gynaecol.* 2022;42(7):3172-80.

26- Safari K, Fadilah N, Hariati S. Quality and measurement properties of sexual health knowledge tools for adolescents: A rapid review. *Patient Educ Couns.* 2024;122:108173.

- 27- Colton D, Covert RW. Designing and constructing instruments for social research and evaluation. Hoboken: John Wiley & Sons; 2007.
- 28- Lawshe CH. A quantitative approach to content validity. *Pers psychol.* 1975;28(4):563-75.
- 29- Waltz CF, Bausell BR. Nursing research: Design, statistics, and computer analysis. Philadelphia: F.A. Davis Company; 1981.
- 30- Karimi L, Mirzaii Najmabadi K, Ebadi A, Makvandi S, Mahdavianm M. Exploring educational structure needed for reproductive health in men related to sexually transmitted diseases and HIV/AIDS: A qualitative study. *Razi J Med Sci.* 2016;23(147):82-90. [Persian]
- 31- Mousavi A, Keramat A, Vakilian K, Esmaeili Vardanjani SA. Development and adaptation of Iranian youth reproductive health questionnaire. *ISRN Obstet Gynecol.* 2013;2013:950278.
- 32- MirzaiiNajmabadi K, Karimi L, Ebadi A. Exploring the barriers to sexual and reproductive health education for men in Iran: A qualitative study. *Iran J Nurs Midwifery Res.* 2019;24(3):179-86.
- 33- Khani S, Moghaddam-Banaem L, Mohamadi E, Vedadhir A, Hajizadeh E. Psychometric properties of the Persian version of the sexual and reproductive health needs assessment questionnaire. *East Mediterr Health J.* 2015;21(1):29-38.
- 34- Seifen T, Shaw CM, Smith CV, Johnson LR. The more you know: Sexual knowledge as a predictor of sexual well-being. *J Sex Marital Ther.* 2022;48(8):779-88.
- 35- Zizza A, Guido M, Recchia V, Grima P, Banchelli F, Tinelli A. Knowledge, information needs and risk perception about HIV and sexually transmitted diseases after an education intervention on Italian high school and university students. *Int J Environ Res Public Health.* 2021;18(4):2069.
- 36- Vakili MM, Babakhani L, Sharifi S, Moazen A, Mehrabi Z, Kamali K, et al. Development and psychometric analysis of a 44-item HIV/AIDS knowledge scale. *Iran J Epidemiol.* 2018;14(2):116-25. [Persian]