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Effectiveness of E-learning on "Sexual Health" among students of Shahid Beheshti University of Medical Sciences based on the Kirkpatrick model

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Abstract:

BACKGROUND: Implementing educational programs such as E-learning is highly low-cost and highly effective. The aim was to design and implement a sexual health education program to enhance female students' knowledge based on the Kirkpatrick model.

MATERIAL AND METHODS: This study was a quasi-experimental intervention study conducted on 60 female students of the Medical Ethics course at Shahid Beheshti University of Medical Sciences based on the Kirkpatrick model. After needs assessment and determining the course syllabus, the teaching content was produced electronically and made available to the research population after scientific (Women's Group) and technical (E-Learning Group) approval. Data analysis was performed based on Mann–Whitney U test and independent *t*-test through SPSS version 26.

RESULTS: The mean (standard deviation) scores of the Kirkpatrick level 2 measurement (learning) of the participants increased from 15.34 (4.89) before the intervention to 16.88 (5.20) after intervention ($P < 0.001$), which was statistically significant. The participants' satisfaction rate with the educational content was 86%, with the course duration was 94.4%, with the educational facilities and equipment was 85.4%, and with the presentation method and attractiveness of the materials was 86.3%. In total, the participants' satisfaction rate with the electronic course was 88%.

CONCLUSIONS: The results of this study indicated a positive impact of the course on students' knowledge regarding sexual issues, and the students overall expressed satisfaction with this electronic course. Therefore, it is recommended to implement this course extensiver in other universities considering the advantages of E-learning.

Keywords:

E-learning, evaluation, sex education, student

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Introduction

The cornerstone of any society is the family. Looking at divorce statistics and the prevalence of sexual disorders, it becomes clear that addressing these subjects is only possible through awareness and education.[1] The best time for education is a period where there is potential acceptance of the education, and its delivery does not pose harm. Timely education appears to be a key factor in development.[2,3] If sexual subjects are taught according to age and in line with the religious and social values prevailing in society, it leads to the formation of accurate information.[4]

Healthy sexual relationships are dependent on the sexual health of couples. According to the definition of the World Health Organization, sexual health refers to the physical, emotional, mental, and social well-being in relation to sexual

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desires, and it does not merely mean the absence of disorders, or disability. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as access to enjoyable and safe sexual experiences free from coercion, discrimination, and violence.[5] Martin[6] mentioned that gender, sexual identity, structural factors, and social support are important factors in understanding sexual health literacy among young people. Martin investigated decision-making regarding sexual health among young people in various areas including schools, peers, and social media, and considered the impact of these areas on decision-making. Health literacy is a determinant of health behavior.[7]

Despite the importance of sexual health in life, subjects related to it are considered taboo, and perhaps for this reason, despite the considerable importance of the subject, it is still neglected.[8,9] Sexual health is one of the vital dimensions of public health, which is related to individual health, families, and even society[10] and can influence other dimensions of health, such as physical, mental, and even social health.[11] Sexual health reflects an important part of experiences related to health; therefore, a proper understanding and perception of sexual issues is necessary for the promotion of sexual health in its various dimensions. Sexual education is one of the key elements in achieving reproductive health, aiming to address issues such as sexual misconduct, infertility, sexually transmitted diseases, and ultimately creating sexual satisfaction.[10]

Today, the widespread use of new technologies and the consequent need for more education and higher costs have led educational centers to adopt innovative educational solutions. One of these solutions is electronic education and learning. Research shows that E-learning, if it has appropriate educational content and evaluation, is an effective and efficient system.[11,12] In the present era, global patterns and methods can be used for education.[13] E-learning is a solution for distance learning that is facilitated by the widespread penetration of the Internet.[14,15] Its advantages include effective learning, time and cost savings,[11] accessibility anywhere, flexibility with job responsibilities, and student interaction in learning.[16]

There are many methods for evaluation, and one of them is "Kirkpatrick model," which is an accepted framework for evaluating educational programs.[17] This model is one of the evaluation models for educational programs. It is based on a goal-oriented and systematic approach. This model addresses the evaluation of educational programs at four levels: reaction, learning, behavior, and results.[18] At the first level, the satisfaction of learners with the program is measured. At the second level, the learning of participants is assessed in behavior level, changes in learners' behavior are evaluated. At the results level, attention is given to learners' capability, improvement in performance, and its effects on the work environment.[19,20] This model is recommended as a comprehensive, simple, and practical for evaluating many educational programs and is recognized by many experts as a criterion in this field.[21] Numerous educational programs in the field of health have been evaluated using the "Kirkpatrick model," but no similar study on evaluating volunteer health programs using the "Kirkpatrick model" was found by reviewing reliable databases.[20,21]

The socio-cultural context of Iran is very important in terms of sexual health literacy because access to information and sexual vulnerability is related to gender differences in the Iranian population.[22] Therefore, it is necessary to use tools based on or compatible with the culture to measure each aspect of sexual inclinations. Low sexual health literacy is associated with an increased likelihood of risky sexual experiences, high rates of sexually transmitted infections, and unintended pregnancies. Having sexual health literacy has consequences such as enhancing the ability to understand and assess risks related to sexual health, delaying first sexual experiences, reducing and choosing low-risk sexual partners, engaging in safe sexual experiences, reducing unintended pregnancies and sexually transmitted diseases, providing appropriate opportunities for expressing gender roles, improving sexual interactions between couples, promoting individual sexual health, and ultimately improving family and social health.[23] In the age of technology, it is necessary to provide new content based on new methods.

Education for females is the foundation of growth and development in any society.[24] The findings of research on the status of sexual education indicate insufficient education in this area, highlighting the need for proper and context-specific education. Therefore, the research team aimed to provide practical solutions by creating awareness and a relative balance, taking into account the goals and key documents of the country, so that students can benefit from these topics in their personal lives. The purpose of this study was to design and implement a sexual health education program to enhance the knowledge of female students and empower them for a healthy marital life.

Study design and setting

This study employed a quasi-experimental design of intervention type, aiming to design, implement, and evaluate an E-learning program on "Sexual Health."

The curriculum for this course was developed by the Women's Affairs Department of the Student Affairs Office to promote marital life. After multiple sessions and consultations with experts in the fields of education and women's issues, the curriculum was approved and incorporated as part of the religious studies course for female students at Shahid Beheshti University of Medical Sciences. Before starting the research, an in-person class was held to present the objectives and the procedure of participation in the study. Initially, participants' demographic information, including age, marital status, field of study, educational level, academic semester, previous semester's Grade Point Average, experience in opposite-sex relationships, and previous study of family and marital issues, was collected. The content of the educational PowerPoint was developed based on the initial needs assessment conducted by the Women's Affairs Department of the Medical School and reviewed and approved by the Religious Studies Department to align with the Iranian-Islamic culture. The content was produced in the form of storylines within the Virtual School of Medical Education and Management and was qualitatively reviewed and approved by the E-Learning Department of the Virtual School of Medical Education and Management. It was then offered as a course module consisting of four sessions on the learning management system "Navid" of SBMU, accessible to the research population. At the beginning of the course, a test was conducted to assess the participants' initial knowledge. The educational content was made available to the learners for one month.

Study participants and sampling

The research was conducted in the second semester of the academic year 2021-2022, involving undergraduate and professional doctorate students who voluntarily chose the religious studies course. Participants were assured that their information would remain confidential

Data collection tool and technique

The evaluation of the effectiveness of the educational course was conducted using the Kirkpatrick model[25] at two levels: level 1 (reaction) and level 2 (learning). The participants' satisfaction was measured at the end of the course using the standardized questionnaire of Mohammadi *et al*.,[26] which had a reliability coefficient of 0.83 calculated using Cronbach's alpha. The questionnaire consisted of 13 items, and the scoring was based on a five-point Likert scale: Excellent (score 5), Very Good (score 4), Good (score 3), Average (score 2), and Weak (score 1). For reporting purposes, Excellent and Very Good were considered as good satisfaction, Good and Average as average satisfaction, and Weak as poor satisfaction.

The level 2 measurement was performed by comparing pre test and post test after one month of educational intervention. This questionnaire, which included 8 demographic items and 15 multiple-choice questions knowledge items, was designed by the researcher. Two relevant professors designed knowledge items, and these items were reviewed for face validity by five medical education specialists and for content validity by five female university professors and received approval. To assess the reliability of the tool, the Cronbach's alpha method was used. The questionnaire was administered to 30 students, and after data collection, the information was entered into the SPSS software. The coefficient of correlation was used to confirm the scientific reliability of the research tool. The reliability of the level 2 measurement tool for Kirkpatrick's pyramid was obtained as 2.81.

All questionnaires were designed and loaded into the Porsline Software and made available to the research population through the WhatsApp social network. SPSS 26 software was used to analyze the collected data. Descriptive statistics were used to express measures such as frequency, mean, and standard deviation. Statistical tests such as one-way analysis of variance, Mann–Whitney U, Kruskal–Wallis, and independent *t*-test were used as needed, and the significance level was $P = 0.001$.

1. Pre test knowledge assessment questionnaire https://survey.porsline.ir/s/2GCa1r2n
2. Post test knowledge assessment questionnaire https://survey.porsline.ir/s/1goJlxPQ
3. Satisfaction measurement questionnaire https://survey.porsline.ir/s/WGSE50MV
4. Course quality assessment questionnaire https://survey.porsline.ir/s/2jKVYZSd.

Ethical consideration

This study is the result of a master's thesis. The author is the corresponding author and has the code of ethics as IR.SBMU.SME.REC.1400.090 from Committee Ethics of SBMU.

Results

The findings Table 1 showed that Sixty people participated in this research; 100% of them read the educational content and completed all the questionnaires. The average age of the participants was 19 years. Although there are many tools to measure the reaction of the participants in the courses, the questionnaire is the most used tool for asking people's opinion.[27] In level 1 [Table 2], the satisfaction measurement, the results showed a level of satisfaction in the research population regarding E-learning in other

demographic components (P = 0.007). In level 2, the results showed that the mean test scores of participants increased significantly after education (P < 0.0001). The results indicated that E-learning was effective in learning level.

The findings Table 3 showed that the students of the SBMU were significantly satisfied with the E-learning course on sexual health, and their overall satisfaction was not influenced by contextual factors such as academic level, academic semester, field of study, GPA of the previous semester, the university they attended, marital status, history of studying marital issues, and having relationship with the opposite sex.

Table 1: Descriptive data of demographic information based on demographic information and absolute and relative distribution

Demographic information		Frequency	Percent
Age group	18-24	54	90
	25-30	6	10
Marital status	Single	42	70
	Married	18	30
Education	BA	6	10
	PhD	54	90
Field of study	Medicine, dentistry, pharmacy	54	90
	Midwifery, nursing	6	10
	Laboratory science, nutrition, health	0	0
Last semester GPA	Below 18	16	26.7
	18 and higher	44	73.3
University	SBMU	58	96.7
	Guest students from other universities	2	3.3
Academic semester	First	0	0
	Second	53	88.3
	Third and higher	7	11.7

Table 2: Comparison of the mean scores before and after level 2 measurement of Kirkpatrick model (learning)

Variable	Mean	SD	Mean difference	Upper limit	Lower limit	Statistical test
Before	15/34	4/89	-1/54	0/83-	2/24-	t=-4/30
After	16/88	5/20				df=149
						P<0/0001

The mean (standard deviation) of level 2 measurement scores of the Kirkpatrick model (learning) increased from 5.34 (4.89) before the intervention to 16.88 (5.20) after the intervention (P<0.001)

Table 3: Frequency and percentage of satisfaction questionnaire

Reaction level	Good No. (%)	Average No. (%)	Poor No. (%)
Educational content	258 (86)	40 (13/3)	2 (0/7)
Course time	283 (94/4)	17 (5/6)	0
Educational facilities and equipment	256 (85/4)	39 (13)	5 (1/6)
The way of content presentation and material attractiveness	256 (86/3)	39 (13)	2 (0/7)

Discussion

According to Table 2 indicated that the average (standard deviation) scores of the participants' level 2 measurement in the Kirkpatrick model (learning) increased from 15.34 (4.89) before the intervention to 16.88 (5.20) after the intervention. The participants' satisfaction level with the educational content was 86%, with the course duration was 94%, with the training facilities and equipment was 85%, and with the way of presentation of content and attractiveness of materials at 86%.

A study conducted in the United States in 2022 regarding sexual education courses at the university level demonstrates the necessity of sexual education at the college level.[28] The results of a study in Poland in 2017 indicate limited access of Polish adolescents to sexual education, highlighting the need for comprehensive educational planning to enhance adolescent knowledge in sexual matters that align with their age and needs.[29]

In a study conducted in 2003 to examine the effectiveness of sexual education in high schools, students' knowledge and attitudes toward practicing safe sexual behaviors were examined, and significant changes in their knowledge were observed after the education. Therefore, the need for comprehensive scientific sexual education is felt for outcomes such as awareness of pregnancy prevention, the development of sexual skills in healthy relationships, and sexually transmitted diseases.[30]

E-learning is rapidly expanding and has the potential to transform the entire educational system. The adoption of E-learning is increasing among learners, and as a result, universities are compelled to incorporate this type of education.[31]

Today, the integration of E-learning as an achievement of the modern education system in the process of teaching and learning is inevitable. Additionally, factors such as learners' needs, evaluation, modification, and adaptation of instructional materials can guarantee the success of these types of education. Currently, E-learning courses constitute a significant part of higher education, and understanding learners' perspectives toward this type of education will create more suitable learning environments. Proper reactions encourage the implementation of future educational courses and motivate other students to participate in these programs.[32] Today's learners are referred to as digital natives or the internet generation. They were born into a different world filled with digital technology, which has become integral to their lives. Therefore, educators need to make changes in teaching methods and learning content.[33]

The findings of Cakır and Solak (2015)[34] in Turkey demonstrate that attitudes play a significant role in

encouraging learners to use E-learning. This result has been examined in many previous studies. Most studies have shown that attitude is a vital component that can influence the intention to use technology. In E-learning processes, features such as technology acceptance and individual learning styles were identified as primary factors when assessing learners' attitudes.[35] Currently, E-learning is one of the most advanced topics in the educational institution.[36,37]

Other studies have focused on the satisfaction of participants in medical departments' training programs at level 1 using the Kirkpatrick model, and all of them have indicated positive reactions to the training programs.[38,39] Yoon *et al*.[40] examined a professional development program for physicians using the Kirkpatrick model. The results of their study showed that at level 1, participants expressed a significant level of satisfaction with their participation in the training course. The findings of the study by Mazloomy Mahmodabad *et al*.,[21] titled "Evaluation of the Effectiveness of Occupational Health Training Courses in Iran Based on the Kirkpatrick Model," indicated the satisfaction of the trainees with the program.

Considering the findings of "Sexual Health" E-learning course in terms of both reaction and learning levels, along with the advantages of conducting the course electronically. it provides a greater opportunity for SBMU to evaluate student education in this field. By considering the mentioned points and properly implementing the electronic Sexual Health training course, it is possible to reduce the educational costs for universities and also reduce the expenses associated with infertility treatment and sexually transmitted diseases, thus preventing the negative consequences of unintended pregnancies.[41,42] The implementation of this course contributes significantly to improving the overall health of the community through increasing awareness in sexual learning and reproductive health.[43] The enthusiasm of today's young generation to be informed about sexual issues,[44] compared to previous generations, along with easy access to information through the Internet and social networks, necessitates the provision of age-appropriate sexual education that aligns with the societal conditions.[45,46]

Limitation and recommendation

Among the most important limitations of this course the following can be mentioned:

- The sampling method used in this study is based on the level of education and studying in a university.
- Holding the course exclusively for female students.
- Disallowing the course for male students due to the moral considerations of educational subjects.
- Holding the course with limited hours and as part of the course under the supervision of the education department and not as a free course.

Conclusion

Although before the research, it seemed that medical students were familiar with reproductive physiology issues, the holding of sexual health e-courses showed that this e-course had a positive effect on knowledge of sexual subjects. With the development of women's health policies and programs in Iran, it is necessary to identify the gaps, eliminate the needs in the optimal design of the programs, and provide services according to the needs and based on scientific evidence.

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Conflicts of interest

There are no conflicts of interest.

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