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Iranian Students' Satisfaction with Virtual Education

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Abstract

Background: Medical education has comprehensive goals that include students' achievement of cognitive, attitudinal, and practical skills. Therefore, it is important that students, in addition to participating in theory classes, attend clinical environments interact with patients, professors, and colleagues, and participate in simulation training programs. So, this study aimed to investigate the Shiraz University of Medical Sciences students' satisfaction with virtual education.

Methods: This cross-sectional study was performed on 204 students at Shiraz University of Medical Sciences, Shiraz, Iran, during 2021-2022. The survey questionnaires were constructed using the Iranian online platform Porsline® and distributed electronically via WhatsApp application and SMS messages.

Results: The findings showed that the majority of students (n=139, 68.1%) had a medium satisfaction level and 30.4% of them (n=62) were very satisfied with the virtual educational system. There was a significant relationship between virtual education satisfaction levels in the field of education.

Conclusion: It is necessary to provide the infrastructure of virtual education and plan to provide a cultural platform to accept virtual education as much as possible.

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Introduction

Medical education has comprehensive goals that include students' achievement of cognitive, attitudinal, and practical skills. Therefore, it is important that students, in addition to participating in theory classes, attend clinical environments interact with patients, professors, and colleagues, and participate in simulation training programs.[1, 2] However, in some situations, online learning may be a good alternative to traditional learning to maintain the continuity of educational activities.[3]

E-learning is a web-based, online, or internet-based learning for distance learning to distribute information, communication, and knowledge through electronic devices.[4, 5] With the development of information technology, the adoption of e-learning has grown rapidly, and e-learning has become a powerful medium for education and one of the main factors in socio-economic development.[6, 7] So that e-learning will become a major stream by 2025.[7] In this regard, a randomized controlled trial demonstrated that delivering stressmanagement

and sleepquality training through a web application (Naranj) significantly reduced stress levels and improved sleep quality among college students during the COVID19 pandemic.[8]

Although this training method has many benefits, including quick and easy access to information materials, interaction with other learners without time or geographical constraints, greater flexibility, and reduced educational costs[4-7, 9, 10] concerns about inexperience, lack of technical support, Internet discontinuity, low motivation and interest, poor Internet connection time, software problems, late feedback or encouragement, social isolation and loneliness have been reported due to the lack of physical presence of classmates.[4, 5, 9]

One of the essential conditions for success in e-learning is student satisfaction with e-learning, which can be defined as an individual's understanding of the extent to which needs, goals, and learning desires are met. Student satisfaction reflects the difference between student expectations and the understanding of the e-learning experience.[6, 11] Based on studies, teacher performance, active teacher participation in discussion, interaction, course quality, technology quality and ease of use, multimedia use in teaching sessions, sufficient time devoted to e-learning, course evaluation, student and learner factors are related to students' satisfaction with e-learning.[6, 7, 10, 12, 13]

In this regard, the satisfaction of medical science students from e-learning courses has been evaluated in different studies. Nejadghaderi et al. (2024) conducted a study in an Umbrella review, which revealed numerous disadvantages including technical challenges, privacy issues, reduced student engagement, connectivity issues, and digital exhaustion. and the overall satisfaction rate for online learning exceeded 50%.[14] In the study of Alenezi et al. (2023) in Saudi Arabia, satisfaction with online courses was significantly higher than in attendance courses in medical students.[1] In the study of Pratheebha (2022) in India, 43% of dental students were satisfied with online teaching methods.[15] In the study of Grados-Espinoza et al. (2022) in Peru, only 34.8% of medical students had a high degree of satisfaction with virtual education, and of the 10 students, seven had a low level of satisfaction with virtual education.[2] In the study of Delam et al., (2022) students' satisfaction with virtual education was moderate in Iran.[16] The results of studies in different countries are largely different and sometimes contradictory.

The dynamics of educational systems in the 21st century depend on e-learning as an alternative or complementary to traditional education.[12] The World Health Organization has introduced e-learning as a useful tool for meeting health education needs in developing countries. In Iran, e-learning has begun at all levels of education since March 2019 and continues until now.[4] On the other hand, policymakers and instructors should be aware of the satisfaction of students from online courses to improve e-learning programs and support student needs.[9, 15] This study aimed to investigate the Shiraz University of Medical Sciences students' satisfaction with virtual education.

Methods

Design and Participants

This was a cross-sectional study that was conducted to explore students' satisfaction with virtual education. Based on a similar study,[17] considering the design effect of 1.5 and the potential attrition rate of 15%, the sample size was calculated to be 204 students based on population proportion formula. Additionally, we set the significance level (α) at 0.05. The participants in this study were recruited between June and July 2022, from three colleges of Shiraz University of Medical Sciences including "School of Nutrition and Food Sciences", "School of Health", and "School of Management and Medical Information". These colleges were selected because of their diverse academic disciplines and because there was some homogeneity in the nature of their online courses. This made it possible to compare the nature of online learning across the different disciplines.

All students who matched the inclusion criteria and were willing to participate from these colleges were included. Inclusion criteria required that the student was actively engaged in online learning and took a minimum of two courses online through an online learning platform such as Adobe Connect, Google Meet, or Skype. A total of 204 of these students agreed to participate and completed the survey instrument.

The convenience sampling method was adopted since it was particularly effective in reaching the students using the Internet. All students joining this study first received an elaboration of the purpose of this research and granted informed consent by filling out a questionnaire. Responses were thus fully covered, encompassing all those who could possibly take part m. The students from these schools represented a variety of disciplines, and the nature of their online courses was similar.

To measure students' satisfaction with online learning, we used a questionnaire of satisfaction with virtual education that was developed by Sheikh Taheri and Dehnad (2020), which was originally in Persian.[18] The Cronbach's alpha of the questionnaire was 0.94. This questionnaire consists of 26 items on a 5-point Likert scale with a score of 1 = strongly

disagree, 2=disagree, 3=uncertain, 4=agree, and 5=strongly agree. The score of the questionnaire was between 26 and 130 (less than 45.5 was considered low satisfaction, 45-5.90 was medium satisfaction, and 91-130 was high satisfaction). The survey questionnaires were constructed using the Iranian online platform Porsline® and distributed electronically via WhatsApp application and text messages. Also, we used a questionnaire to collect demographic data, including age, gender, and field of education.

Data Analysis

Descriptive statistics was used to describe the study variables. The Kolmogorov-Smirnov test was used to assess the normal distribution of data. Furthermore, independent T-Test, one-way analysis of variance, and Scheffe's post hoc test were used for statistical data analysis using SPSS version 20.0.

Ethical Considerations

This study was approved by the ethics committee of Shiraz University of Medical Sciences (IR.SUMS.SCHEANUT.REC.1402.011). Participation in the study was voluntary. All participants signed the informed consent. Moreover, the confidentiality of the information was assured. Also, data was collected anonymously and only an identity number was used on each questionnaire.

Results

Findings showed that 204 participants with a mean age of 22.61±1.14 (20 to 27) years completed the questionnaires (a response rate of 78.5%). Moreover, most of the students were female (75%), studying Nutrition (20.6%), used mobile phones (36.8%), and used the Adobe Connect platform (68.6%) to participate in online classes (Table 1).

In addition, the majority of the students (n=139, 68.1%) had a medium satisfaction level. While 30.4% (n=62,) of them were very satisfied and 1.5% (n=3) were unsatisfied. Moreover, most of the students (n=92, 45.1%) were satisfied with the used platform. Although, 39.7% of the participants (n=81) stated that they were dissatisfied and had a negative experience with the used platform.

One-Sample Kolmogorov-Smirnov Test showed that the data had a normal distribution (P>0.05). According to the analysis, among all considered demographic variables, only the field of education had a significant relationship with satisfaction level (p<0.001). There is no statistically significant relationship between e-learning satisfaction and age, gender, tools (devices used to attend online classes), and platform (Table 1). However, results showed a statistically significant difference between e-learning satisfaction and the field of education (p<0.001). The Scheffe post hoc test showed that the e-learning satisfaction of the Health Care Management field of study (94.43±20.29) had a significant difference with that of Nutrition (78.19±16.99, p=0.03), and Health Care Management (94.43±20.29, p<0.001) and Public Health (75.10 ±14.83, p<0.001) fields of study (Table 1).

Table 1: Frequency distribution of the participants' characteristics and relationship between e-learning satisfaction and demographic variables

Demographic characteristics		Number (%)	E-learning satisfaction	
			Mean±SD	P value
Gender	Female	153 (75)	81.05±18.37	0.212*
	Male	51 (25)	86.03±20.52	
Field of Education	Occupational Health	24 (11.8)	76.70±16.20	<0.001**
	Public Health	38 (18.6)	75.10 ±14.83	
	Environmental Health	25 (12.3)	84.36±17.02	
	Vector Biology and Control of Diseases	9 (4.4)	86.11±23.40	
	Nutrition	42 (20.6)	78.19±16.99	
	Health Information Technology	36 (17.6)	85.94±21.02	
	Health Care Management	30 (14.7)	94.43±20.29	
Tools	PC	9 (4.4)	94.11±26.20	0.15**
	Tablet	3 (1.5)	74.33±37.58	
	Mobile Phone	75 (36.8)	79.55±19.11	
	Laptop	46 (22.5)	86.00±19.18	
	Mobile Phone and Laptop	62 (30.4)	82.35±16.11	
	Mobile Phone and PC	9 (4.4)	76.89±18.33	
Platform	Skype	0		0.31**
	Sky Room	3 (1.5)	80.67±35.79	
	Adobe Connect	140 (68.6)	83.83±19.14	
	Google Meet	2 (1)	62.50±27.57	
	Adobe Connect and Sky Room	46 (22.5)	78.63±17.38	
	Adobe Connect and Skype	12 (5.9)	81.92±18.43	

*Independent Sample T-Test; **One-way analysis of variance (ANOVA)

Table 2: Key Capabilities and Minimal Effects of Virtual Education from the Student's Perspective

Key Capabilities of Virtual Education	Mean±SD
Possibility of downloading content	4.06±0.776
Variety of educational content formats	3.93±0.800
Compatibility of educational content formats with the course content	3.84±0.912
Possibility of learning at any time and place	3.69±0.997
Ease of use and no need for special skills	3.53±0.809
Minimal Effects of Virtual Education	**Mean±SD**
Improvement of learning	2.59±1.190
Possibility of group discussion	2.70±0.990
Possibility of communicating with the instructor properly	2.73±0.968
Reaching the lesson goals	2.75±1.186
Instructors' support for better utilization of virtual education	2.82±0.866

The most important capabilities of virtual education as well as the lowest effects of virtual learning from the student's point of view shown in the Table 2.

Discussion

The results showed that more than half of the students had medium satisfaction with virtual education. This result was like previous studies such as Iravani et al. (2022) at Iranian medical universities,[4] Delam et al. (2022) at Larestan University of Medical Sciences,[16] and Alosta et al. (2023) in Jordan,[9] that the level of satisfaction and quality of virtual education was moderate. In a systematic review by Tabatabaeichehr et al. (2022), the level of satisfaction with e-learning among medical students was 51.8%.[12] in an umbrella review by Nejadghaderi et al., the overall satisfaction rate for online learning exceeded 50%.[14] On the other hand, according to Taher et al. (2022) in Iraq, about 64.8% of students were not satisfied with the experience of e-learning.[5] Also, student satisfaction in Turkey was at a moderate level.[19]

In this study, the field of Education has a significant relationship with satisfaction level. Age, gender, tools, and platform had no direct influence on student total satisfaction. Studies showed that different factors influence user satisfaction including lecturers, courses, technology, and platform.[20-22] It seems that the educational field of students affects their level of satisfaction. Fields that only have theoretical courses and less practical courses have more satisfaction. As in the present study, healthcare management students were more satisfied with virtual education than other students. In the present study, there was no significant difference in virtual education satisfaction between the two genders. This is similar to other studies that rejected the role of gender in virtual education satisfaction.[23] In the study of Tomic et al. (2023) in Serbia, the satisfaction of nursing students was evaluated from virtual education. There was no significant difference between gender and satisfaction rate.[11] However, other studies showed women more satisfaction.[20, 24] In a systematic review study, factors such as age, gender, clinical year, and the level of education of medical students had a significant relationship with the satisfaction of e-learning.[12] In the study of Pratheebha in India (2022), the satisfaction of female dental students was significantly lower than male students.[15] These differences may be due to differences in sample size and different methods of measurement and evaluation.

In this study, student's satisfaction with the possibility of downloading content, the diversity of educational content formats, compatibility of educational content formats with course content, the possibility of learning at any time and place، Ease of use, and no need for special skills were acceptable. On the other hand, improving learning, the possibility of group discussion, the possibility of communicating with the instructor correctly, and achieving the goals of the lesson were not acceptable to the students. Similarly, Instructor factors, course quality, technology quality, and ease of use are factors affecting student satisfaction in an e-learning environment.[7] The determinants of student satisfaction with e-learning in a Korean medical school were systemic, learner, instructor, and interaction qualities.[6] In a study conducted by Mohamed et al. (2022) in Malaysia, student factors and system quality were the most predictive factors for student satisfaction with e-learning.[13] Based on the results of a review study, many of the factors that are significantly related to student satisfaction with e-learning are the presence of the instructor in online settings; interaction between students, teachers, and content؛ Planned communication between online and offline activities.[25] In the present study, the students stated that it is challenging to have a group discussion and establish proper communication with the instructor, while, a study showed that teachers' feedback for homework is the main factor affecting student satisfaction.[26] It is important to pay more attention to interactive learning. To achieve student satisfaction, blended training (both virtual and in-person) should be applied.[20] Therefore, more efforts should be made to improve interactive features such as interactive teaching styles, and participatory activities, providing appropriate training to educators and learners for e-learning.

Strengths of the Study

This study has several strengths that enhance its value and credibility. The findings provide valuable insights into students' satisfaction levels with virtual education, which are crucial for improving future e-learning strategies. Additionally, by including a diverse sample of students from various fields such as Nutrition, Public Health, and Health Care Management, the study offers a broad perspective on how students from different disciplines perceive virtual education, helping to identify both the strengths and areas for improvement in e-learning systems.

Limitations of the Study

While this study provides valuable insights, it has some limitations that should be considered when interpreting the results. The convenience sampling method may affect the generalizability of the findings. Self-reported data may also be subject to social desirability bias.

Suggestions for Future Studies

To achieve a more comprehensive and practical understanding, future studies are encouraged to adopt longitudinal designs to investigate the long-term effects of virtual education. Employing random sampling methods and combining quantitative data with qualitative approaches, such as interviews or focus groups, could provide deeper insights into students' experiences. Additionally, examining the impact of virtual education on academic performance, comparing it with traditional in-person education, and conducting a more detailed analysis of technical and instructional factors could contribute to the improvement of e-learning systems in the future.

Conclusion

The results of the present study showed that students had medium satisfaction with virtual education. It is necessary to provide the infrastructure of virtual education and plan to provide a cultural platform to accept virtual education as much as possible. The use of virtual educational methods should be given special attention so that everyone can benefit from it in the future. In addition to educational systems, there is a need for more studies to determine the quality level of education provided using new technologies. So, more research is needed to explore long-term effects and outcomes for different students and diverse fields of education.

Authors' Contribution

FKh, SJM, NB, ZKh, and MA made substantial contributions to the conception and design of the study. Data collection was performed by NB and FKh. Data analysis and interpretation were carried out by FKh, SJM, NB, and ZKh. FKh, NB, SJM, and MA conducted the intervention and participated in drafting the manuscript. All authors revised the manuscript critically for important intellectual content and finally approved the version to be published.

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Conflict of Interest

None of the authors have any competing interests.

References

1 Alenezi S, Bahathig A, Soliman M, Alhassoun H, Alkadi N, Albarrak M, et al. Performance and satisfaction during the E-learning transition in the COVID-19 pandemic among psychiatry course medical students. Heliyon. 2023;9(6).

2 Grados-Espinoza P, Zila-Velasque JP, Soriano-Moreno DR, Regalado-Rodríguez KM, Sosa-Nuñez F, Barzola-Farfán W, et al. A cross-sectional study to assess the level of satisfaction with virtual education in Peruvian medical students. Frontiers in Public Health. 2022;10:1004902.

3 Cofini V, Perilli E, Moretti A, Bianchini V, Perazzini M, Muselli M, et al. E-learning satisfaction, stress, quality of life, and coping: a cross-sectional study in Italian university students a year after the COVID-19 pandemic began. International journal of environmental research and public health. 2022;19(13):8214.

4 Iravani M, Nasab MB, Bahmaei H, Ghanbari S, Mohaghegh Z, Siahkal SF. The level of satisfaction and quality of E-learning in medical universities of Iran during the epidemic of COVID-19. Journal of Education and Health Promotion. 2022;11(1):9.

5 Taher TMJ, Saadi RB, Oraibi RR, Ghazi HF, Abdul-Rasool S, Tuma F. E-learning satisfaction and barriers in unprepared and resource-limited systems during the COVID-19 pandemic. Cureus. 2022;14(5).

6 Si J. Critical e-learning quality factors affecting student satisfaction in a Korean medical school. Korean Journal of Medical Education. 2022;34(2):107.

7 Bossman A, Agyei SK. Technology and instructor

dimensions, e-learning satisfaction, and academic performance of distance students in Ghana. Heliyon. 2022;8(4).

8 Aslani A, Khademian F, Ravangard R, Nami M, Jafari P, Bastani P. The effectiveness of a web application (Naranj) for stress management among college students during covid-19 outbreak: a randomized clinical trial. Current Psychology. 2025:1-11.

9 AlOsta MR, Khalaf I, Othman EH. Jordanian nursing students' engagement and satisfaction with e-learning during COVID-19 pandemic. International journal of nursing education scholarship. 2023;20(1):20220053.

10 Alqahtani MA, Alamri MM, Sayaf AM, Al-Rahmi WM. Exploring student satisfaction and acceptance of e-learning technologies in Saudi higher education. Frontiers in psychology. 2022;13:939336.

11 Tomić SD, Tomić S, Malenković G, Malenković J, Šljivo A, Mujičić E, editors. COVID-19-related stress, fear and online teaching satisfaction among nursing students during the COVID-19 pandemic. Healthcare; 2023: MDPI.

12 Tabatabaeichehr M, Babaei S, Dartomi M, Alesheikh P, Tabatabaee A, Mortazavi H, et al. Medical students' satisfaction level with e-learning during the COVID-19 pandemic and its related factors: a systematic review. J Educ Eval Health Prof. 2022;19(37):10.3352.

13 Mohammed LA, Aljaberi MA, Amidi A, Abdulsalam R, Lin C-Y, Hamat RA, et al. Exploring factors affecting graduate students' satisfaction toward E-learning in the era of the COVID-19 crisis. European Journal of Investigation in Health, Psychology and Education. 2022;12(8):1121-42.

14 Nejadghaderi SA, Khoshgoftar Z, Fazlollahi A, Nasiri MJ. Medical education during the coronavirus disease 2019 pandemic: an umbrella review. Frontiers in Medicine. 2024;11:1358084.

15 Pratheebha C, Jayaraman M. Learning and satisfaction levels with online teaching methods among undergraduate dental students–A survey. Journal of Advanced Pharmaceutical Technology & Research. 2022;13(Suppl 1):S168-S72.

16 Delam H, Kavi E, Eidi A, Sookhak F. Assessing students' satisfaction regarding the use of virtual learning at Larestan University of Medical Sciences. Interdisciplinary Journal of Virtual Learning in Medical Sciences. 2022;13(2):118-26.

17 Farsi Z, Ahmadi Y, Afaghi E, Sajadi SA. Satisfaction of the quality of education and virtual education during the Covid-19 pandemic in nursing students of aja university of medical sciences in 2020. Journal of Military Medicine. 2022;23(2):174-85.

18 Sheikh Taheri A, Dehnad A. Investigating the views of students of Iran University of Medical Sciences on the use of e-learning management system. Research Project Iran University of Medical Sciences. 2020.

19 Simsek I, Kucuk S, Biber SK, Can T. Online learning satisfaction in higher education amidst the Covid-19 pandemic. Asian Journal of Distance Education. 2021;16(1):247-61.

20 Osmani F. Analysis of students satisfaction with virtual education in Medical Science University during the pandemic outbreak of COVID-19. International Journal of Assessment Tools in Education. 2021;8(1):1-8.

21 Gholipour Mofrad Dashtaki D, Mohammadi A, Zolfaghari M, Imani S, Tahmasebian S. The relationship of satisfaction and usage of virtual learning facilities with learning style in medical, health, and operating room students. Strides in Development of Medical Education. 2020;17(1):1-6.

22 Moazami F, Bahrampour E, Azar MR, Jahedi F, Moattari M. Comparing two methods of education (virtual versus traditional) on learning of Iranian dental students: a post-test only design study. BMC medical education. 2014;14:1-5.

23 Akram W, Adeel S, Tabassum M, Jiang Y, Chandio A, Yasmin I. Scenario analysis and proposed plan for Pakistan universities–COVID–19: Application of design thinking model. 2020.

24 Zaharah Z, Kirilova G, Windarti A. Impact of corona virus outbreak towards teaching and learning activities in Indonesia. 2020.

25 Nortvig A-M, Petersen AK, Balle SH. A literature review of the factors influencing e-learning and blended learning in relation to learning outcome, student satisfaction and engagement. Electronic Journal of E-learning. 2018;16(1):pp46-55-pp46-55.

26 Viner RM, Russell SJ, Croker H, Packer J, Ward J, Stansfield C, et al. School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. The Lancet Child & Adolescent Health. 2020;4(5):397-404.