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A Survey of Medical Students' Opinions on the Quality of Virtual Education Courses Held in Bushehr University of Medical Sciences during the COVID-19 Pandemic

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Abstract

Background: Evaluation is necessary to reform and advance activities. The main purpose of the evaluation of education in universities is to improve the training programs and activities of faculty members. This study aimed to investigate the opinions of medical students about the quality of virtual education courses held during the COVID-19 period.

Materials and Methods: The present cross-sectional study was performed at Bushehr University of Medical Sciences in 2020. Consensus sampling was used to select medical students. Data collection was carried out using baseline characteristics and a valid 13-item questionnaire. Medical students were asked to rate the items based on a five-point Likert scale. Data were analyzed using SPSS software version 16.0.

Results: Ninety medical students participated in this study. Of the participants, 57.8% were women and 11.1% were married. Findings showed that 84.5% of students agreed to have virtual education courses and 57.7% of students expressed satisfaction with the quality of virtual education. The results also showed that 84.5% of students expressed dissatisfaction with the occurrence of technical and infrastructural problems during online education sections, and 70% of students expressed dissatisfaction with unresponsiveness to their homework activities. There was a statistically significant relationship between satisfaction with virtual education and the gender of students ($P<0.05$).

Conclusion: A total of 84.5% of students agreed with holding virtual education sections, and more than half were satisfied with the quality of virtual education. Two-thirds of the students were dissatisfied with the occurrence of technical and infrastructural problems during online sections, as well as failure to respond to students' homework and questions on time.

Key Words: COVID-19, Medical Students, Virtual Education, Quality.

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1- INTRODUCTION

In December 2019, a new strain of the coronavirus was identified in Wuhan, China (1), and spread rapidly to most parts of the world in a short time. The first COVID-19 cases in Iran were reported on February 19, 2020, in Qom city (2-4). The rate of transmission and endemicity of the disease was so high that on March 11, 2020, the World Health Organization (WHO) declared COVID-19 as a global pandemic (5). Evidence indicates that this global threat has not only led to an increase in clinical and administrative demands, but it also has had a significant detrimental impact on the employment, economics, and living status of people, and their educational needs. The COVID-19 pandemic is currently affecting the activities of universities and educational institutions (6), and its effects on future educational prospects will continue (6). Improving the quality of teaching and learning is an important subject in academic institutions. Therefore, evaluation programs inevitably form an important part of their activities (7).

Various methods are used to guarantee the quality of the learning experience and determine the rate of learning in traditional education. However, in the current situation, and with regard to the coronavirus outbreak, education is not possible in the traditional manner and is mainly provided electronically and on the internet. The term *"e-learning,"* first introduced by Cross, refers to the type of training that uses the internet and intranet technologies for learning (8). Virtual training refers to training in a virtual or simulated environment or when the learner and the instructor are in separate locations (i.e., remote). It can be synchronous or asynchronous. A virtual learning environment (VLE) is a system designed to facilitate the teachers' management of educational courses for their students, especially using computer hardware and software, and also involves distance learning. The terminology of systems that integrate and manage computer-based learning has changed over the years. Useful terms in understanding and searching for earlier materials include (9-12):

- Computer-assisted Instruction (CAI)
- Computer-based Training (CBT)
- Computer-managed Instruction (CMI)
- Course Management System (CMS)
- Integrated Learning Systems (ILS)
- Interactive Multimedia Instruction (IMI)
- Learning Management System (LMS)
- Massive Open Online Course (MOOC)
- On-demand Training (ODT)
- Technology-based Learning (TBL)
- Technology-enhanced Learning (TEL)
- Web-based Training (WBT)
- Media Psychology.

The use of virtual education comes with advantages and disadvantages; e-learning not only facilitates the transfer of new information but also leads to improvement in the level of knowledge, creating equal learning opportunities for all people, and enhancement of the quality of education (13). Digital lessons designed with suitable teaching methods or models can have a positive effect on learners. E-learning accelerates the interaction between students and professors (14). However, it should also be noted that the success of training in this method depends on the ability of learners to use a computer. Not all learners have access to a working computer and the internet. Low internet speed and high costs challenge many users. In addition, virtual education systems may have technical problems; for example, many systems do not support the Persian language. Practical lessons are not well taught in virtual systems. Moreover, preparing appropriate educational content

requires a lot of time and effort on behalf of teachers, and students are not equal in terms of access to facilities (15). Despite the advantages and disadvantages of e-learning, some universities in Iran and other countries have adopted e-learning independently to provide education. The use of e-learning was particularly expanded in schools and universities during the COVID-19 pandemic. At the same time, universities are considering launching virtual education systems for their students and have held classes during the present semester using virtual education systems. Based on what is said above, an important undertaking is to conduct surveys on the quality of virtual training, its challenges, and solutions, and evaluate the learning experience of students. This study aims to investigate the opinions of medical students about the quality of virtual education provided during the COVID-19 period.

2- MATERIALS AND METHODS

2-1. Method

This cross-sectional study was carried out at Bushehr University of Medical Sciences in Bushehr, Iran, in 2020. The study population included all medical students of Bushehr University of Medical Sciences. Consensus sampling was used to select medical students.

2-2. Statistical population

After consulting a statistical advisor, 90 medical students were selected using simple random sampling method considering an error rate of 5% and a confidence interval (CI) of 90%. All medical students studying at Bushehr University of Medical Sciences were eligible to enter the study. Also, the students should have had at least one semester of face-to-face and virtual classes. Exclusion criteria included unwillingness to participate in the study and incomplete questionnaires.

2-3. Data Collection

A valid 13-item questionnaire was used to obtain information regarding virtual teaching during the COVID-19 pandemic (16). The questionnaires were distributed among medical students by the researchers (through telephone interviews, web-based questionnaires, and face-to-face visits in hospitals and colleges) after providing the necessary explanations to them. The questionnaires were collected after completion.

2-4. Ethical consideration

Participants' personal information was extracted as a whole, and it was not compulsory to provide names and surnames. Participation in the study was optional, and the professors were assured that the information would be extracted in a general manner and their names would not be disclosed. The study results were also made available upon request.

2-5. Reliability and Validity

The validity of the questionnaire was confirmed by the content validity method through consultation with experts (two faculty members of medical education and three from the pediatrics faculty). The Cronbach's alpha coefficient of 87% was calculated to determine reliability, which indicated the appropriate internal consistency of the questionnaire questions.

2-6. Statistical Analysis

Data analysis was performed using SPSS software version 16.0. Descriptive (mean, standard deviation, frequency, and percentage) and analytical (independent t-test and Chi-square) statistics were used for data analysis. A p-value< 0.05 was considered as the significance level.

3- RESULTS

Ninety medical students participated in the study. Of the participants, 57.8% were female and 11.1% were married. A total of

28.9% of the students had entered the university in 2015, 44.4% in 2016, and 26.7% in 2017. Students' opinions on the quality of virtual education during the COVID-19 period are shown in **Table.1**. As the results show, 84.5% of students agreed to hold virtual education courses, 57.8% of students considered the time allocated to each topic appropriate, and 57.7% of students were satisfied with the quality of virtual education. The results also showed that 84.5% of students expressed dissatisfaction with the occurrence of technical and infrastructural problems during online education, 70% of students expressed dissatisfaction with not receiving quick responses, and 50% of students believed that the number of courses did not support the course content volume. The findings also showed that only 40% of students believed that lesson objectives and descriptions were explained clearly at the beginning of the course.

Table-1: The students' opinions on the quality of virtual education during the COVID-19 period (%).

No.	Items	Totally agree	Agree	No comments	Disagree	Completely disagree
1	Lesson objectives and descriptions were clearly communicated at the beginning of the course.	4.4	40	15.6	32.2	7.8
2	The content presented was reasonably organized and sequenced and helped to achieve the educational goals during the course.	4.4	37.8	24.4	24.4	8.9
3	The volume of course content was proportional to the number of courses.	3.3	34.4	12.2	45.6	4.4
4	The time allotted to each topic was appropriate.	5.6	52.2	11.1	31.1	0
5	The quality of the uploaded educational content (audio-video) was good.	12.2	42.2	7.8	30	7.8
6	The presentation method (how students participate and interact, provide examples and assignments, etc.) was appropriate.	5.6	38.9	32.2	23.3	0
7	The sum of the contents, assignments/tests and feedback, provided effective learning and sufficient motivation to study.	1.1	31.1	26.7	34.4	6.7
8	The assignments presented in the virtual course were reasonable and transparent.	8.9	24.4	21.1	38.9	6.7
9	It was possible to respond to tasks on time.	1.1	21.1	7.8	58.9	11.1
10	Technical and infrastructural problems disrupted the learning process during the course.	32.2	44.4	6.7	16.7	0
11	The assignments and virtual test were appropriate to the objectives and content of the course.	8.9	30	21.1	38.9	1.1
12	To succeed in the exam, it is necessary to participate in virtual training courses.	47.8	36.7	5.6	10	0
13	Overall, the quality of education in this course was virtually satisfactory.	4.4	53.3	16.7	23.3	2.2

The Chi-square test showed that there was no statistically significant relationship between the year of entering the university and the students' opinions about the quality of virtual education (**Table.2**).

Table-2: The relationship between university views on the quality of virtual education and the academic year.

Year	Item 1.0					Total*
	Totally agree	Agree	No comments	Disagree	Completely disagree	
2015	1	16	1	8	0	26
2016	2	10	11	13	4	40
2016	1	10	2	8	3	24
Total	4	36	14	29	7	90
Chi-square=15.092, df: 8, P-value=057.						
Year	Item 2.0					Total
	Totally agree	Agree	No comments	Disagree	Completely disagree	
2015	1	12	6	7	0	26
2016	1	13	12	8	6	40
2016	2	9	4	7	2	24
Total	4	34	22	22	8	90
Chi-square=7.683, df: 8, P-value=0.465.						
Year	Item 3.0					Total
	Totally agree	Agree	No comments	Disagree	Completely disagree	
2015	1	6	1	17	1	26
2016	1	18	5	16	0	40
2016	1	7	5	8	3	24
Total	3	31	11	41	4	90
Chi-square=14.173, df: 8, P-value=0.077.						
Year	Item 4.0					Total
	Totally agree	Agree	No comments	Disagree	Completely disagree	
2015	1	17	1	7	-	26
2016	2	18	6	14	-	40
2016	2	12	3	7	-	24
Total	5	47	10	28	-	90
Chi-square=3.968, df: 6, P-value=0.681.						
Year	Item 5.0					Total
	Totally agree	Agree	No comments	Disagree	Completely disagree	
2015	1	15	1	7	2	26
2016	6	15	3	13	3	40
2016	4	8	3	7	2	24
Total	11	38	7	27	7	90
Chi-square=5.660, df: 8, P-value=0.685.						
Year	Item 6.0					Total
	Totally agree	Agree	No comments	Disagree	Completely disagree	
2015	1	11	6	8	-	26
2016	2	19	12	7	-	40
2016	2	5	11	6	-	24
Total	5	35	29	21	-	90
Chi-square=6.689, df: 6, P-value=0.351.						
Year	Item 7.0					Total
	Totally agree	Agree	No comments	Disagree	Completely disagree	
2015	1	4	11	9	1	26
2016	0	18	7	12	3	40
2016	0	6	6	10	2	24

Total	1	28	24	31	6	90
Chi-square=12.012, df: 8, P-value=0.151.						
Year	Item 8.0					Total
	Totally agree	Agree	No comments	Disagree	Completely disagree	
2015	1	11	5	8	1	26
2016	4	6	9	16	5	40
2016	3	5	5	11	0	24
Total	8	22	19	35	6	90
Chi-square=10.917, df: 8, P-value=0.206.						
Year	Item 9.0					Total
	Totally agree	Agree	No comments	Disagree	Completely disagree	
2015	0	5	1	16	4	26
2016	0	9	5	20	6	40
2016	1	5	1	17	0	24
Total	1	19	7	53	10	90
Chi-square=9.684, df: 8, P-value=0.288.						
Year	Item 10.					Total
	Totally agree	Agree	No comments	Disagree	Completely disagree	
2015	7	15	2	2	0	26
2016	15	12	3	10	0	40
2016	7	13	1	3	0	24
Total	29	40	6	15	0	90
Chi-square=7.538, df: 6, P-value=0.274.						
Year	Item 11.0					Total
	Totally agree	Agree	No comments	Disagree	Completely disagree	
2015	2	10	1	13	0	26
2016	5	12	10	12	1	40
2016	1	5	8	10	0	24
Total	8	27	19	35	1	90
Chi-square=11.115, df: 8, P-value=0.195.						
Year	Item 12.0					
	Totally agree	Agree	No comments	Disagree	Completely disagree	Total
2015	9	14	1	2	0	26
2016	22	10	4	4	0	40
2016	12	9	0	3	0	24
Total	43	33	5	9	0	90
Chi-square=8.167, df: 6, P-value=0.226.						
Year	Item 13.0					Total
	Totally agree	Agree	No comments	Disagree	Completely disagree	
2015	2	16	4	4	0	26
2016	2	17	8	11	2	40
2016	0	15	3	6	0	24
Total	4	48	15	21	2	90
Chi-square=7.371, df: 8, P-value=0.497.						

df: Degree of freedom.

The T-test showed that there was a statistically significant relationship between the students' gender and their opinion about the item "appropriateness of the number of courses for the volume of the virtual course content", as it indicated that women had a more positive opinion than men (P = 0.015) (**Table.3**). T-test also

showed that there was no statistically significant relationship between students' marital status and their opinion about the 13 items of the questionnaire (P> 0.05).

Table-3: Relationship between the proportion of virtual course content and students' gender.

Item 15.0		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% CI	
									Lower	Upper
Male: 38, Female: 52	Equal variance assumed	6.155	0.015	1.415	88	0.161	0.31579	0.22315	-0.12768	0.75925
	Equal variances not assumed			1.456	86.42	0.149	0.31579	0.21689	-0.11535	0.74693

df: Degree of freedom.

4- DISCUSSION

The present study aimed to investigate the opinions of medical students about the quality of virtual education courses held during the COVID-19 epidemic at Bushehr University of Medical Sciences. In this study, the level of medical students' satisfaction with the quality of virtual education in the COVID-19 pandemic period was assessed using a 13-item questionnaire whose validity and reliability were confirmed (16). The results of the study showed that 57.7% of students expressed satisfaction with the quality of virtual education. On the other hand, about two-thirds of the students also expressed their dissatisfaction with the occurrence of technical and infrastructural problems during the online sections. The findings also showed that there was a statistically significant relationship between the quality of virtual education and gender so that women were more satisfied with the quality of e-learning. The Cambridge Dictionary defines e-learning as learning through studying at home using a computer and training courses offered on the Internet (17). Therefore, it can be said that e-learning is a type of learning in which technology is used to facilitate the learning process and become independent of time and place for learning (18). In e-learning, the learner's performance can be tracked automatically, and commuting time and cost are reduced (14). The findings of the present study showed that 84.5% of students agreed to hold virtual education courses at the university, and 57.7% of students were satisfied with the quality of virtual education held during the COVID-19 pandemic. The results obtained are not impressive and indicate that conditions are far from ideal; however, considering that this was a critical, stressful, and difficult period for officials, professors, staff, and students, achieving these satisfactory results in such circumstances is admirable. In a study conducted in Pakistan, Faize and Nawaz showed that after using online education methods during the COVID-19 pandemic, the students' satisfaction increased (19). In another study conducted in Saudi Arabia, the results showed that the use of web-based video conferencing during the COVID-19 pandemic led to increased satisfaction among medical students (20). The findings of this study showed no statistically significant relationship between students' overall satisfaction with virtual courses and the two variables of the students' year of entry and marital status. In the study of Noghan et al., no significant relationship was found between students' satisfaction with the course and the variables of the semester, age, average scores of the previous semester, and the number of selected courses by students (21). The present study showed that female

students were more satisfied with e-learning at the university level, which is consistent with the findings of Farsi et al. (22). In the present study, despite the critical conditions during the COVID-19 pandemic, students were still relatively satisfied with the teachers' teaching method. However, efforts are still needed to achieve the ideal conditions, it is therefore suggested that teachers be more open to new teaching methods (including virtual education and more diverse teaching aids), students be more involved in the teaching/learning process, the content transfer skills and expressive power be enhanced; a better knowledge of teaching content could be achieved, and critical evaluation can be carried out.

The results of the present study showed that 84.5% of students expressed dissatisfaction with the occurrence of technical and infrastructural problems during online education, and 70% of students expressed dissatisfaction with not receiving timely responses to their homework activities. It is suggested that access to high-speed internet systems should be provided, systems be upgraded in the academic contexts, virtual systems be localized, and their shortcomings be eliminated. The results of the study also showed that 50% of students believed that the number of courses did not support the volume of the course content. Other studies have reported that heavy workload leads to decreased students' satisfaction with education (21, 23).

Therefore, it is necessary to avoid the accumulation of information and excessive workload in the curriculum. Overwhelming lesson and workloads in medical sciences lead to student burnout, reduced quality of learning and service to clients, and an increased rate of clinical errors, which might endanger the health of the patients and the society (21). On the other hand, it is necessary to provide timely and correct feedback for the student to progress and remove defects. Experts believe that, despite the current critical situation worldwide and in Iran, education, especially medical education, must continue. Therefore, continuing education in medical universities and institutions to train a professional and capable workforce for hospitals in this critical period is a main concern of educational administrators. Researchers believe that not only during the COVID-9 pandemic period but also in the future, medical education programs can benefit from various methods of virtual education, including virtual educational platforms. On the other hand, researchers believe that despite the benefits of virtual education, this method cannot completely replace conventional teaching methods but it can be used as a complementary method in educating students of different medical sciences (24).

5- CONCLUSION

The results showed that 84.5% of students agreed to participate in virtual courses and 57.7% of students expressed satisfaction with the quality of virtual education. The results also showed that two-thirds of the students expressed dissatisfaction due to the occurrence of technical and infrastructural problems during the online training, and 50% of the students believed that the volume of the course did not have the necessary fit with the number of courses. Female students were more satisfied with the quality of virtual education. It is recommended that in addition to education itself, special attention should be paid to its quality. Assessing students' opinions on the quality of education given in the virtual context is not only a criterion for assessing the quality of teaching but also focuses on the possibilities and necessities of educational reform and evaluation by detecting educational defects. By using this approach, it is possible to introduce, identify, and evaluate the experience of

successful teaching/learning styles and start the cycle of modification and improvement of the teaching process, even during the COVID-19 pandemic.

6- AUTHORS' CONTRIBUTIONS

Study conception or design: AY, HL, and NM; Data analyzing and draft manuscript preparation: HL, and NM, Critical revision of the paper: AY and NM, Supervision of the research: AY and HL; Final approval of the version to be published: AY, HL, and NM.

7- CONFLICT OF INTEREST: None.

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