Original Article

The survey of nursing students' attitude towards virtual education and its relationship with their satisfaction during the Covid-19 epidemic: A cross-sectional study

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Abstract:

BACKGROUND: Coronavirus disease 2019 (Covid-19) pandemic has increased virtual education use. This study aimed to determine the attitude of nursing students of Ahvaz Jundishapur University of Medical Sciences towards virtual education and its relationship with their satisfaction during the Covid-19 pandemic.

MATERIALS AND METHODS: This descriptive-analytical study was conducted during 2020–2021 with the participation of 229 nursing students (undergraduate, graduate, and doctoral) who had spent at least one semester virtually at Ahvaz Jundishapur University of Medical Sciences. The sampling method was convenience. The data collection tool was a questionnaire consisting of three parts. The first part included students' demographic information and the second and third parts included the standard questionnaire of individual development and educational assessment to determine students' attitudes toward virtual education and their satisfaction with this type of education. IBM SPSS statistics 22 software and descriptive and analytical statistical tests were used for data analysis.

RESULTS: According to the study results, the mean score of students' attitudes toward virtual education was 35.1 ± 11.3 and the mean score of students' satisfaction with this educational method was 88.3 ± 30.6, both of which are at the desired level. Also, a direct relationship was found between students' attitudes and satisfaction scores ($P < 0.001$).

CONCLUSION: In this study, the attitude of nursing students to virtual education and their satisfaction with this educational method had been at the desired level. Therefore, the relevant authorities should also consider the necessary planning in the field of using this educational method and improving students' attitudes towards it under normal conditions.

Keywords:

Attitude, Covid19, education, nursing, satisfaction

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Received: 29-01-2022
Accepted: 12-05-2022
Published: 26-11-2022

Introduction

In December 2019, coronavirus disease 2019 (Covid-19) appeared in Wuhan, China, and is spreading rapidly around the world.[1] The virus has infected Iran as well as other countries around world, and the first cases of Covid-19 in Iran were identified with the death of two patients in Qom.[2,3] Covid-19 is a large family of viruses that cause diseases, from the common cold to severe respiratory diseases. Common symptoms of Covid-19 include fever, fatigue, cough, shortness of breath, and difficulty in breathing. Most patients have mild symptoms and a good

prognosis. However, severe cases of the disease can be associated with pneumonia, acute respiratory distress syndrome (ARDS), multiple organ failure, and even death.[4]

Currently, the 2019 Covid-19 pandemic has become a global concern and caused major disruptions around the world.[5,6] The borderless spread of this new and deadly virus has affected almost all important economic, political, and social aspects and educational systems around the world, as well as in Iran, which has led to the closure of in-school and university training courses and the abrupt end of the school year.[3,7-9] Therefore, due to the impossibility of regular and continuous attendance in face-to-face classes, the expansion of educational opportunities has become one of the main concerns of countries and governments,[10] and according to the evidence, the need to use virtual education and e-learning development[11] was felt more than ever.

Virtual education is an Internet-based online education course based on values such as individualism, independent learning, autonomy, and active learner participation.[12] The advantages of this educational method include access from any place and at any time, asynchronous discussions with classmates, immediate feedback on tests, and flexibility.[8] However, education using computer also has its own limitations. These limitations include the lack of adequate bandwidth and appropriate telecommunications infrastructure for data transmission and the lack of technical skills required to work with computers and networks by learners and teachers.[13]

In Iran, virtual education at the higher education level is done through mobile apps and learning management systems such as Navid and Vesta. Therefore, virtual education can be considered a turning point in education in Iran these days.[8] This is more important in nursing education. According to the evidence, nursing education is the basis for providing efficient human resources to meet the needs of society, while nursing students consider themselves nurses who do not have adequate skills and competence to care for patients. Therefore, providing effective nursing education in the current situation can develop students' competence, which in turn leads to more accurate and ideal care for patients in the real world.[14,15] E-learning methods improve the skills and competence of nurses for patient care.[16]

Successful e-learning is not possible without considering the views of the people. Understanding students' attitudes to virtual education help them and educational planners to know what actions they can take to provide more effective virtual education.[11] Therefore, it is necessary for universities to emphasize students'

attitudes and expectations from this type of education.[10] However, there are few studies on the attitude towards the use of technology in education and distance education, and study in this field can increase the existing knowledge in the field of virtual education effects and meet the relevant challenges.[11] Among the few studies conducted in this field, we can mention a study in 2014 in Gilan. This study has shown that students' attitudes to virtual education were positive.[10]

The students' satisfaction with a course has a significant effect on understanding the efficiency of that course.[17] In a study conducted in Saudi Arabia during the Covid-19 pandemic, 82% of medical students were highly satisfied with the use of web-based video conferencing.[18] In a study by Farsi *et al*.[19] during the Covid-19 pandemic, 56.3% of nursing students at AJA University of Medical Sciences had moderate satisfaction with virtual education. A study in Romania during the Covid-19 pandemic reported that higher education institutions in the country were not ready for only online learning.[20]

Due to the importance of the subject, few existing studies on the satisfaction and attitude of nursing students, especially during the Covid-19 pandemic to virtual education, and the contradiction in the results of previous studies in the field of students' satisfaction with virtual education, this study was conducted to determine the attitude of nursing students of Ahvaz Jundishapur University of Medical Sciences to virtual education and relationship with their satisfaction during Covid-19 pandemic in the academic year 2020–2021.

Materials and Methods

Study design and setting
This descriptive-analytical cross-sectional study investigated the attitudes of nursing students of Ahvaz Jundishapur University of Medical Sciences to virtual education and its relationship with their satisfaction during the Covid-19 pandemic.

Study participants and sampling
The statistical population included all students studying at the undergraduate, graduate, and doctoral levels in nursing in the academic year 2020–2021. The sample size was estimated to be using the Cochran's formula below and the size of the statistical population (567 students) was estimated $n = 229$. The samples were selected by convenience method and participated in the study.

$$N = \frac{Nz2pq}{Nd2 + z2pq}$$

Inclusion criteria include satisfaction with participation in the study and spending at least one semester virtually at Ahvaz Jundishapur University of Medical Sciences and

exclusion criteria also include incomplete completion of questionnaires.

Data collection tool and technique

The data collection tool was a questionnaire consisting of three parts. The first part included students' demographic information (such as age, gender, level, semester, and marital status) and the second and third parts included the standard questionnaire of individual development and educational assessment (IDEA), which investigated students' attitudes to virtual education and their satisfaction with this type of education. This questionnaire has five fields of teacher teaching (20 questions), educational content (12 questions), lesson difficulty (3 questions), students' attitude and behavior to the whole course (7 questions), and students' perception and judgment about education (5 questions), a total of 47 5-choice questions based on the Likert scale, scored from 1 to 5. This questionnaire had a total score of 47 to 235. The results of this questionnaire are marked as mean, standard deviation, and percentage. Getting a higher score means a more positive attitude towards virtual education and more satisfaction with this type of education. The validity of the Persian version of this questionnaire has been reviewed and confirmed by Nourian *et al*.[21] The reliability of this tool has been reported 0.97 by Cronbach's alpha.

Ethical consideration

The method was that after obtaining the code of ethics IR.AJUMS.REC.1399.847 and the required permission from the Department of Research of Ahvaz Jundishapur University of Medical Sciences, due to the lack of face-to-face classes, the consent form to participate in the study, and the online link of the mentioned questionnaires were provided to the students through virtual student groups. In the consent form that was given to the students through virtual groups, the code of ethics, the objectives of the research, and the names of researchers were mentioned. It was also stated in the consent form that participation in this research is optional and the researchers consider it their duty to keep all the information of the participants confidential and to publish it only for the purposes of the research and in general. The students who had inclusion criteria and did not have exclusion criteria were then asked to complete and submit a consent form and questionnaires as self-reports. A total of 229 students participated in the study, then the questionnaires were analyzed using IBM SPSS statistics 22 software and descriptive (frequency, percentage, mean, and standard deviation) and analytical (such as Pearson correlation coefficient) statistical tests.

Results

The study results on demographic information of the participants indicated that among 229 participating students, 139 students (60.7%) were female, and 155 students (67.7%) were single. The mean and standard deviation of students' age was 25.9 ± 6.4. Other students' demographic information is reported in Table 1.

After investigating the demographic information and the computer access and use, the students' satisfaction and attitude and their relationship with variables such as age, gender, level of education, computer use, employed or unemployed students, and accommodation at home with or without parents or dormitory were investigated. Table 2 shows the general scores of students' satisfaction and attitude.

As shown in the table, the students' satisfaction score is from 37 to 171 with a mean of 88.3 and the standard deviation is 30.6, and their attitude toward virtual education is from 12 to 60 with a mean of 35.1 and the standard deviation is 11.3. Therefore, the satisfaction and attitude of nursing students at Ahvaz Jundishapur University of Medical Sciences have been estimated to be at the desired level.

Pearson correlation coefficient investigating the relationship between students' satisfaction and attitude

Table 1: Demographic information of the participants

Variable	Number	Percentage
Gender		
Male	90	39.3
Female	139	60.7
Marital status		
Single	155	67.7
Married	74	32.3
Level of education		
B.A	147	64.2
M.A	58	25.3
Ph.D.	24	10.5
Employment status		
Employed	61	26.6
Unemployed	168	73.4
Accommodation		
Dorm	94	41
Home with parents	101	44.2
Home without parents	34	14.8
Easy access to computers		
Yes	172	75.1
No	57	24.9
Daily use of computer		
1-2 h	143	62.4
2-3 h	33	14.4
>3 h	53	23.2

Table 2: Statistical indicators of students' satisfaction scores and attitudes to virtual education

Score	Mean	SD	Min	Max
Satisfaction	88.3	30.6	37	171
Attitude	35.1	11.3	12	60

to virtual education showed a direct relationship between students' attitudes and satisfaction scores ($P < 0.001$). In other words, as students' attitudes become more positive, the score of satisfaction has also increased [Table 3].

Pearson correlation coefficient showed a direct relationship between scores of students' satisfaction and attitude, and age ($P < 0.001$). Spearman correlation coefficient showed a direct relationship between scores of satisfaction ($P = 0.009$) and attitude ($P = 0.002$) with students' educational level. Also, a direct relationship was between easy access to the computer and daily computer use and scores of satisfaction ($P = 0.001$) and attitude ($P < 0.001$).

Independent t-test showed that the mean score of satisfaction between male and female students was not significantly different ($P = 0.59$). But the mean attitude score in female students was significantly higher than male students ($P = 0.047$).

Investigating the relationship between scores of satisfaction and attitude, and marital status, the independent t-test showed that the mean scores of satisfaction and attitude in married students were significantly higher than in single students ($P < 0.001$).

In another study, the independent t-test showed that the mean scores of satisfaction ($P = 0.04$) and attitude ($P = 0.02$) of employed students were significantly higher than unemployed students.

One-way analysis of the variance test showed that the mean scores of satisfaction and attitude were significantly different between students with different residence places ($P < 0.001$). So that the mean scores of satisfaction and attitude of students living at home without parents were higher than students living at home with parents, and those living at home with parents were higher than students living in dormitories.

Discussion

The present study was conducted to determine the attitude of nursing students toward virtual education and its relationship with their satisfaction during the Covid-19 pandemic. The study results showed that 75.1% of students had easy access to computers and a direct relationship was between easy access to computers and students' attitudes and satisfaction with virtual

Table 3: Pearson correlation coefficient between students' satisfaction scores and attitudes to virtual education

Variable	Score of attitude	
	r	*P*
Score of satisfaction	0.785	<0.001

education. In this regard, the study results of Kiakojouri *et al*.[22] showed that the most important components of e-learning were infrastructure, software, and hardware. In another study, it was stated that the availability of computers was one of the main factors affecting the students' satisfaction.[23]

The study results showed that students who used computers for more hours had better attitudes and satisfaction scores than virtual education. Evidence also shows that one of the variables affecting students' perception of e-learning is the rate of computers and Internet use.[24]

On the other hand, in this study, the satisfaction and attitude of nursing students at Ahvaz Jundishapur University of Medical Sciences have been estimated at the desired level. In a study conducted in Saudi Arabia during the Covid-19 pandemic, 82% of medical students were highly satisfied with the use of web-based video conferencing.[18] Vatan Parast *et al*.[11] in a study concluded that 85% of nursing students in Kerman had a positive attitude toward virtual education. In a study by Farsi *et al*.[19] during the Covid-19 pandemic, 56.3% of nursing students at AJA University of Medical Sciences had moderate satisfaction with virtual education. Also, a study by Malkawi *et al*.[25] in the Emirate found that the students' satisfaction level and attitudes to virtual classrooms were high during the Covid-19 pandemic.

Another result of this study was the direct relationship between students' attitudes to virtual education and their satisfaction with this educational method. In other words, in this study, as students' attitudes to virtual education became more positive, their satisfaction scores also increased. Few studies have been conducted on the relationship between students' attitudes to virtual education and their satisfaction with this educational method, including a study by Rhema *et al*.[26] in Libya, which stated that engineering students and their instructors had a positive attitude to e-learning but low satisfaction with their past e-learning experiences, which is inconsistent with the study results and is probably due to the difference in educational facilities and conditions of the study participants with the study conducted in Libya.

The study results showed that the mean score of satisfaction between male and female students was not significantly different, but the mean score of attitude in female students was significantly higher than male students. Farsi *et al*.[19] in their study found a significant difference between the scores of male and female students' satisfaction with virtual education. Also, Borhani *et al*.[27] in their study found no significant difference between the mean scores of male and female

students. Perhaps the reason for this difference is the different conditions of the students participating in this study and their different skills in using virtual education.

According to the study results, the mean scores of satisfaction and attitude toward virtual education of married students were significantly higher than single students. Perhaps the reason for this is the more responsibilities of married students than single students, who will have more time to do their other responsibilities as education becomes virtual, and traffic reduces, as they do not attend classes. Of course, Borhani *et al*.[27] in their study found that the mean attitude of married or single students was not significantly different, which contradicts the results of the present study and may be due to different living conditions of participants in this study with other studies.

Another result of this study was that the mean scores of satisfaction and attitude of employed students were significantly higher than unemployed students. Naturally, employed students will be more satisfied with not attending classes because they have fewer problems with the virtualization of education for their jobs. However, the results of the present study were inconsistent with the study results of Borhani *et al*.[27] In this study, no significant difference was found between the attitudes of employed and unemployed students, which may be due to the different living conditions of the participants in this study with other studies.

Another result of the present study was that the mean scores of satisfaction and attitude of students living at home without parents were higher than students living at home with parents, and those living at home with parents were higher than students living in dormitories. Perhaps the reason for this is the presence of nursing internships that require non-native students to use dormitories, while the number of those living in dormitories is higher than those at home limiting the access to virtual education facilities for theoretical courses. This result was inconsistent with the results of other studies. For example, Borhani *et al*.[27] in their study found that non-native students had a better mean attitude toward virtual education compared to native students.

The study results showed a direct relationship between students' satisfaction and attitude scores and their age and level of education. In this way, by increasing the students' age and education level, their view and satisfaction with virtual education will be better. In this regard, the study results of Borhani *et al*.[27] were consistent with the present study and the study results showed that people of older ages had a better view of virtual education. Perhaps the reason for this is the increase in experience and computer skills in people of

higher age and level of education. However, Vatan Parast *et al*.,[11] by studying the students of Kerman School of Nursing and Midwifery concluded that the older the students, the more negative the satisfaction with virtual education, which was inconsistent with the results of the present study.

Limitation and recommendation
One of the limitations of this study is that the questionnaires used in data collection were self-reportedly completed by the participants in this study, which may be biased in answering the questions of this questionnaire.

Since virtual education is a new method, so it is suggested to conduct further studies in this regard among students of medical universities, especially in a qualitative way to better identify the unknown dimensions of this educational method.

Conclusion

The study results showed that the attitude of nursing students to the use of virtual education was positive and their satisfaction with this educational method was at the desired level. Therefore, virtual education can be used as a new method of education not only during the Covid-19 pandemic but also during normal times. It is also possible to improve students' satisfaction with this educational method and their performance by changing students' attitudes to information technology and reducing their concerns while using this tool.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflicts of interest

There are no conflicts of interest.

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